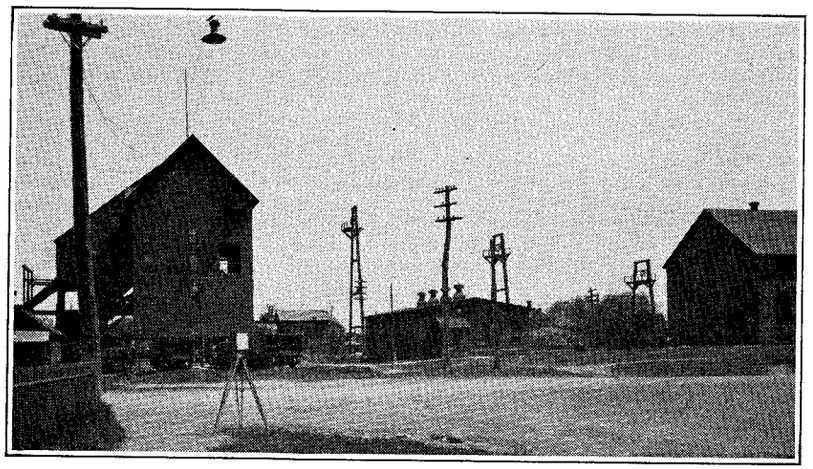
of Houghton and Keweenaw counties amounted to $33,368,000 or about 58 per cent of the total valuation of all property in those counties which was approximately $57,500,000. The assessed valuation of the copper mines in 1936 amounted to only $7,250,000." This represents a shrinkage in valuation of over $26,000,000 in a period of five years or the equivalent of more than $5,000,000 per year. This downward trend in valuation of Michigan copper mines was due to a number of factors, many of which had their origins in the recent disastrous depression.

Causes of the Copper Depression

The copper industry in Michigan was affected by the rise to importance of mines in Africa and the resultant competition with foreign trade. The exploitation of extensive deposits of copper ore in the western states, where low mining costs are largely defrayed



FROM THE DEPARTMENT OF CONSERVATION

40. SHAFT HOUSE AND SURFACE EQUIPMENT, OSCEOLA COPPER MINE, CALUMET

by the valuable by-product minerals recovered in smelting operations, set up an economic barrier against Michigan's copper industry. It was possible for western copper to be mined, smelted, and placed in the New York market at a price below that of the actual cost of mining the native metal in Michigan. In the face of this serious competition it was not surprising that the copper mines of the state suffered a serious relapse. The increased use of scrap copper in the metal industry together with the increasing depth of recoverable ore bodies in several Michigan mines and the consequent exhaustion of major ore bodies assisted in giving the final blow.

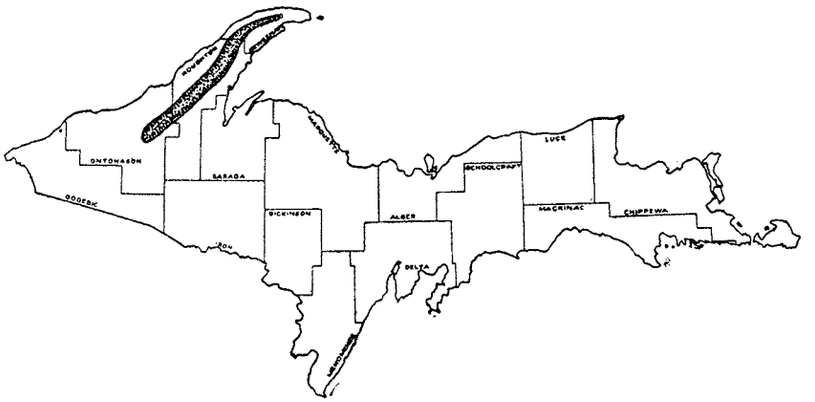


FIGURE 41. LOCATION OF COPPER DEPOSITS
There is no copper in the Lower Peninsula

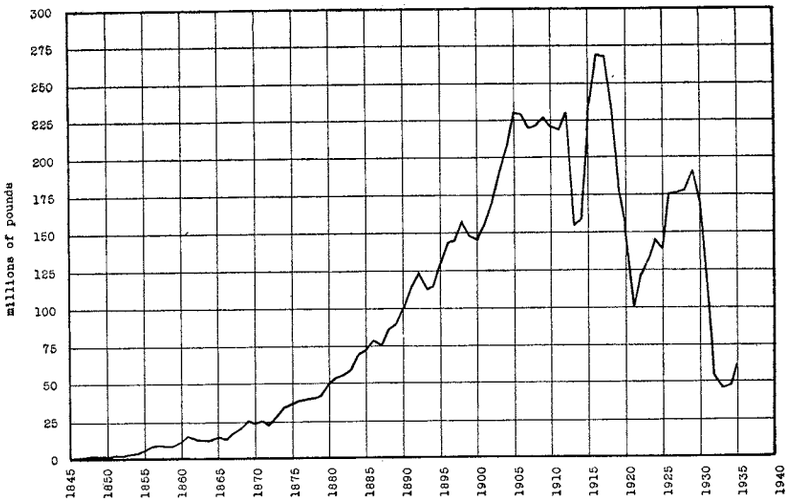


FIGURE 42. PRODUCTION OF COPPER ORE IN MICHIGAN

The general decline of industrial activity which began in 1929, followed shortly by a collapse of the copper market, had an abrupt and widespread effect on the mining activities in Michigan. The price of copper declined to an unprecedented low of 6.3 cents per pound in 1932. In 1935, the average price of copper was slightly more than 2 cents higher and in 1936, the average market price was 9.47 cents.

Mine Shafts Go Deep

Michigan copper occurs essentially as native metal and is now being mined by means of deep shafts, some of which extend to vertical depths of over a mile. In 1934 the average yield of copper per ton of ore mined underground in Michigan was 69 pounds.

The average cost of producing Michigan copper for the market in 1930, the last year for which figures are available, was 12½ cents per pound.* Costs during the past six years have declined somewhat, however, due to improved methods of mining, closer selection of the ground mined, and the closing of marginal mines.

Michigan's copper industry has supported about 10,000 workers in a district whose population of approximately 58,000 inhabitants (1930 census) is largely dependent on the mines for its existence. During the depression, when the mining industry was at its lowest ebb, a large proportion of the population of Michigan's "copper country" was forced out of employment. Recovery in that area has been slow and will continue to lag because many mines have found it necessary to shut down operations permanently.

Unless new and extensive deposits of high grade ore at relatively shallow depths are discovered, it is quite obvious that the Keweenaw district will rapidly lose its prestige as a mining center and soon fade out of the national picture so far as copper production is concerned.

Salt and Gypsum in Michigan

Salt Deposits From Evaporated Sea Water

The extensive beds of salt and gypsum in Michigan were formed by chemical precipitation from the saline waters of the great inland sea during periods of excessive evaporation.** The oceans in which these deposits were concentrated received their supply of mineral material largely from river waters which carried salts dissolved out of surface and subsurface rock over which they flowed. In experimental studies made of saline deposits it has been found that upon evaporation of sea water a series of minerals precipitate out of

*Pardee, Frank—Personal Communication.
**See Chapter I, p. 20.

solution in order of increasing solubilities. When sea water is evaporated to the extent of 80 per cent, gypsum (hydrous calcium sulphate) is precipitated from solution and not until 90 per cent evaporation is reached does salt (sodium chloride) come out. Because these deposits were concentrated by evaporation of salts from solution they are commonly referred to as *evaporites*.

Economic Importance of Salt and Brines

The occurrence of salt springs in the Southern Peninsula of Michigan was known to the Indians long before the advent of the white man. The economic importance of salt lands was clearly recognized in 1835 by the Convention assembled in Detroit for the purpose of formulating a state constitution. In the proposed Constitution submitted to Congress that year was an ordinance which contained an article as follows: "All salt springs within the state, and the lands reserved for the use of the same, at least one section including each spring, shall be granted to the state, to be used and disposed of as the Legislature may direct."

For a period of several years following the admission of the state into the Union, the Legislature made various attempts to develop the state salt lands, as pointed out by Cook.[4] Several wells were drilled by the state through appropriations made by the Legislature but because of an inadequate knowledge of the geology of the formations the undertaking proved a failure. In 1840, while the state was employed in drilling a well on the Grand River three miles below Grand Rapids, Lucius Lyon began a well within the corporate limits of the present city of Grand Rapids. This well was completed the following year at a depth of 661 feet and produced a strong flow of water with a relatively low concentration of salt.

State Promotes Manufacture of Salt

Finally in 1859, the Legislature passed "An Act to encourage the manufacture of salt in the State of Michigan". This act made provision for the exemption from taxation of all lands employed in the industry of salt manufacture and authorized the payment of a bounty of ten cents per bushel for all salt obtained in the state by drilling. This was the stimulus needed to engage private enterprise and from this point on the industry made rapid advances. Twenty-five thousand dollars was expended to drill wells and to promote the salt industry in Grand Rapids but because of the low content of salt in the brine the project was abandoned. At the same time drilling operations were being pushed at East Saginaw. Early in 1860 the first brine was encountered in the Saginaw area and a plant

for the evaporation of salt was placed in operation that same summer.

Scientific Development Makes Michigan Leader

The geological references contained in Winchell's[20] first report, published in 1860, laid the foundation for the development of a scientific plan of exploring for salt deposits in Michigan. The rapid promotion of the industry in the Saginaw Valley, coupled with new discoveries and development of deposits in other portions of the state, enabled Michigan ultimately to become the leading producer of salt in the United States, a position which it has held for the past quarter of a century.

Generally speaking, the salt industry of Michigan may be considered as a stepchild of lumbering operations. The early history and development of salt production is intimately linked with the activities of the sawmills whose waste fuel was employed to heat the pans in which the brines were evaporated.

Three Geologic Formations Contribute Salt

At Midland, Saginaw, and Bay City, salt is produced by evaporation of brines obtained from the Marshall formation.* At Detroit, St. Clair, and Port Huron the salt is manufactured from artificial brines formed by dissolving beds of rock salt in the Salina formation. The natural brines employed in the manufacture of salt at Ludington and Manistee are pumped from the Detroit River formation which contains beds of rock salt as well as brines.

Rock salt is mined by means of the deep shaft method in but one locality in the state, at Oakwood in Wayne County. This shaft was started in 1900 and completed after many serious difficulties and delays in 1910. The salt is taken from various beds of the Salina formation at a depth of approximately 1150 feet.

The first successful well in Midland County was drilled in 1878. The brine produced in this area comes from the Marshall formation and is utilized by the Dow Chemical Company in the manufacture of bromine, iodine, magnesium, calcium chloride, and other chemicals.

In Macomb County, a well was drilled for oil in the late sixties. From the standpoint of petroleum the well was a failure but a strong brine was encountered at a depth of 1000 to 1100 feet. A "salt block" was erected in Mount Clemens for the purpose of manufacturing salt but because of the high percentage of bitter salts (*bitterns*) in the mother liquid the project was unsuccessful. It

*See Chapter I, p. 20.

was soon discovered, however, that brine from this well possessed certain remedial properties for the treatment of rheumatism and there grew up a mineral water industry which has since gained widespread recognition.

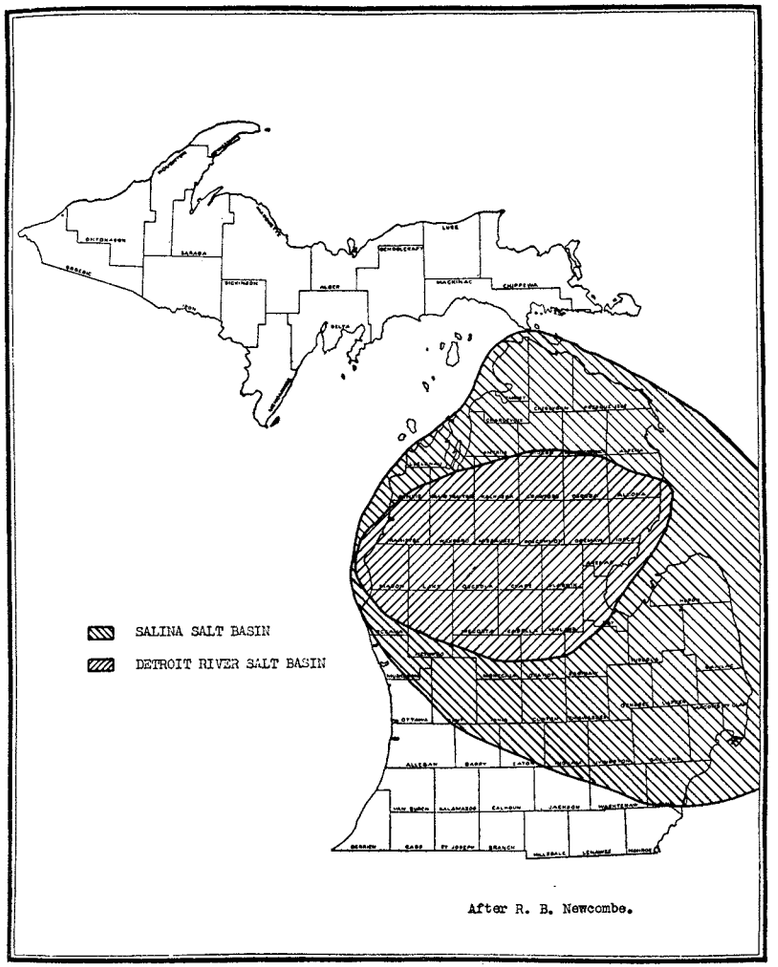


FIGURE 43. AREAS OF SALT PRODUCING FORMATIONS

Salt Deposits Could Supply Entire World Need

In the twenty-five and more years since the commercial development of salt deposits, Michigan has produced a total of 550,000,000 barrels of salt valued at $242,000,000. Still, with all this production, Michigan's reserves of salt and brines have scarcely been touched.

Dr. R. A. Smith, the state geologist, makes the statement that Michigan has known deposits of salt which alone could supply the entire needs of the world for thousands of years to come. Michigan's future in the salt industry is safeguarded by vast reserves of high quality and readily obtainable brines. The extent to which the industry in the state will expand and develop depends largely upon the competition which may be expected when the tremendous Permian deposits of the western states, especially Kansas, Oklahoma, Texas and New Mexico, are more fully exploited for commercial production.

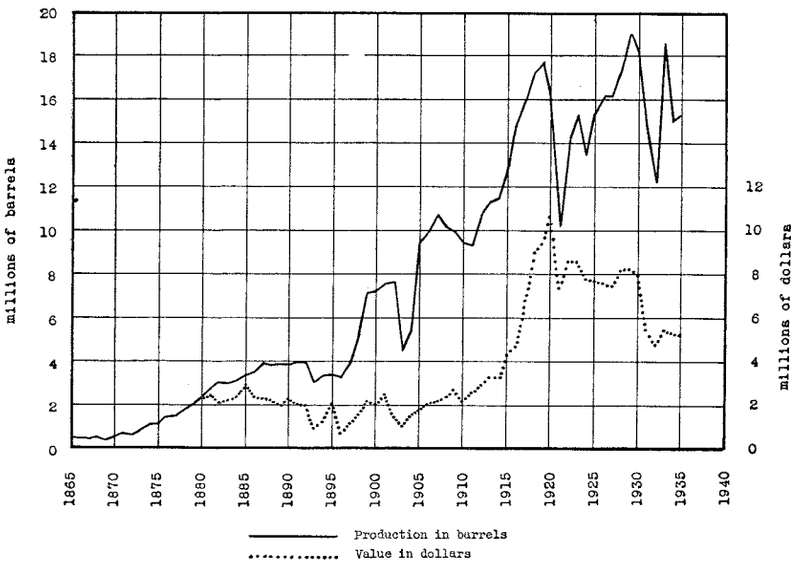


FIGURE 44. PRODUCTION AND VALUE OF SALT IN MICHIGAN

Brines Become Problem to Oil Industry

Since the recent development of Michigan's oil industry, deep wells drilled for petroleum have encountered beds of salt deposits from 700 to 1500 feet thick. Such deposits will produce unlimited supplies of raw material for an indefinite period. Since the development of the oil industry in central Michigan, large quantities of valuable brines, released from wells drilled for petroleum, are annually being wasted. The problem of brine disposal in a manner which will not contaminate surface streams and lakes or pollute sources of drinking water is rapidly becoming more serious. The State Department of Conservation, with a staff of scientific men working in the field, is making a thorough study of this problem in an attempt to control a situation which could easily prove disastrous.

Gypsum

Gypsum First Discovered in Kent County

Gypsum was first discovered in Michigan in 1827 near the mouth of Plaster Creek in Kent County. Its value was not known until ten years later when Dr. Douglass Houghton, the first state geologist, made an examination of beds exposed near Grand Rapids. Grimsley,[6] in his report, states that in the period from "1837 to 1841 gypsum rock was brought from Plaster Creek and ground on a small scale in corn mills." The ledge which supplied the rock varied in thickness from six inches to eight feet.

In 1840 Dr. Houghton again called attention to the outcrops of gypsum in the Grand Rapids area and in the following year, the first mill was erected for the purpose of working the deposits. Although some small amounts of gypsum were manufactured into calcined plaster, the bulk of the material was ground into land plaster, shipped by boat to Detroit and there sold to the farmers for application to the soil. Because of the limited uses to which gypsum was originally adapted the industry made little growth until 1890 when a total of practically 75,000 tons was mined and sold.

Industry Now of Major Importance

With the development of new uses for gypsum and consequent increased demands for the products manufactured therefrom, the industry grew and has become one of major importance in Michigan. From a pioneer enterprise producing less than 500 tons in 1842 the industry has developed to such an extent as to place Michigan among the ranking producers of gypsum in the country. In 1916, the gypsum industry in Michigan reached the million dollar mark with a volume of 457,375 tons mined. In 1924 the state set an all time high with a production of gypsum and gypsum products valued at slightly less than $6,000,000. For several years thereafter the industry continued to maintain a steady high production but with the stagnation of the building trades in 1929 the market dropped. Although there have been wide fluctuations in the amount of gypsum mined from year to year, Michigan crept into second place of production in 1930, a position which it has held ever since.

Principal Mines in Kent and Iosco Counties

The principal gypsum producing areas of Michigan are located at Grand Rapids and Grandville in Kent County and at Alabaster and National City in Iosco County. According to Newcombe[11] "The upper beds of the gypsum series at Grand Rapids are 6 and 12 feet

thick respectively and occur near the surface. A third bed in the western part of Grand Rapids averages about 22 feet in thickness with a parting bed of one foot of shale near the middle, and is found at a depth of 60 feet below the surface. At Grandville the quarry exposes an upper bed 11 feet in thickness which is separated from a lower 14 foot bed by four feet of hard limestone and shale."

The upper gypsum bed which is extensively quarried at Alabaster and National City is from 18 to 30 feet thick.

FIGURE 45. AREAL EXTENT OF THE GYPSUM PRODUCING DEPOSITS

Other Deposits Found

Gypsum deposits of minable thickness have been worked on a small scale in the vicinity of Turner and Twining in Arenac County. Newcombe[10] states that these beds are likewise associated with the Michigan formation but occur at from 50 to 100 feet above the Alabaster bed.*

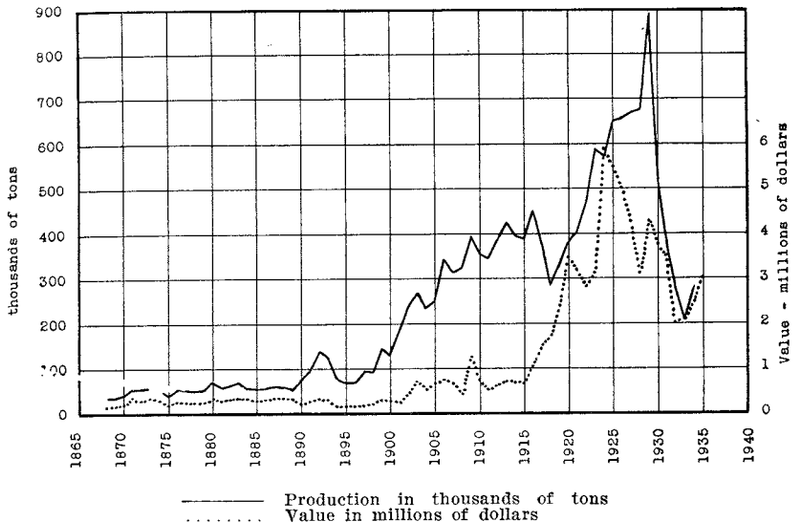


FIGURE 46. PRODUCTION AND VALUE OF GYPSUM IN MICHIGAN

Gypsum beds in the vicinity of St. Ignace in the Northern Peninsula are described by Grimsley as occurring at Pointe Aux Chenes and in St. Martin's and other nearby islands. These deposits which have been recently correlated with the Salina formation of Silurian age, are reported to have an aggregate thickness of 60 feet. Studies of samples taken from deep wells in the central part of the state show the presence of extensive quantities of gypsum. The reserves of gypsum are practically inexhaustible but, in general, the beds within the state are so deeply situated as to be of no immediate commercial importance.

A Growing Industry

The outlook for the gypsum industry in Michigan is favorable. Extensive areas of shallow, workable deposits of high grade material are still available for development. The larger producers of gypsum are ever on the alert to extend the utility of the material

*See Chapter I, p. 20.

and thus create new and more permanent markets for its products. Today the bulk of the calcined gypsum is manufactured into material which finds its way into the channels of the building trades. The welfare of the industry is to a large extent closely linked up with the construction program of the nation. Researches on a broad scale should be carried on to develop new uses for gypsum and its products in an attempt to make the industry more independent of such seasonal and sporadic activities.

Coal in Michigan

How Coal Is Formed

The deposits of bituminous coal* which occur in Michigan were formed during the Pennsylvanian period, at a time when the area was an arm of the sea in which swamp-like conditions prevailed. The first stage in the formation of coal is that involved in the development of peat. Peat is partially decomposed organic matter made up of recognizable remains of plant leaves, stems, roots, fibres, spores, etc., more or less intimately interlaced. It is formed by the activity of *anaerobic* bacteria slowly destroying vegetation which is more or less completely submerged in swamp-like basins of water.

If these areas of organic deposits are partially or completely drained so that the peat becomes exposed to the air and *aerobic* (oxygen loving) bacteria have an opportunity to cause complete decay, then the peat is changed into a type of soil referred to as muck. If, on the other hand, the waterlogged peat is gradually buried under accumulations of sediment carried into the basins by rivers from adjacent uplands, it may eventually become subjected to pressures sufficiently great to form coal.

Formation of Coal a Slow Process

It has been determined that in a region such as that represented by Michigan, peat will form at the rate of approximately one foot in three hundred years. About twenty feet of peat are required to form one foot of compacted bituminous coal so it is readily seen that considerable intervals of time were required for the process of organic accumulation alone. Much longer time was needed to complete the changes from peat to coal.

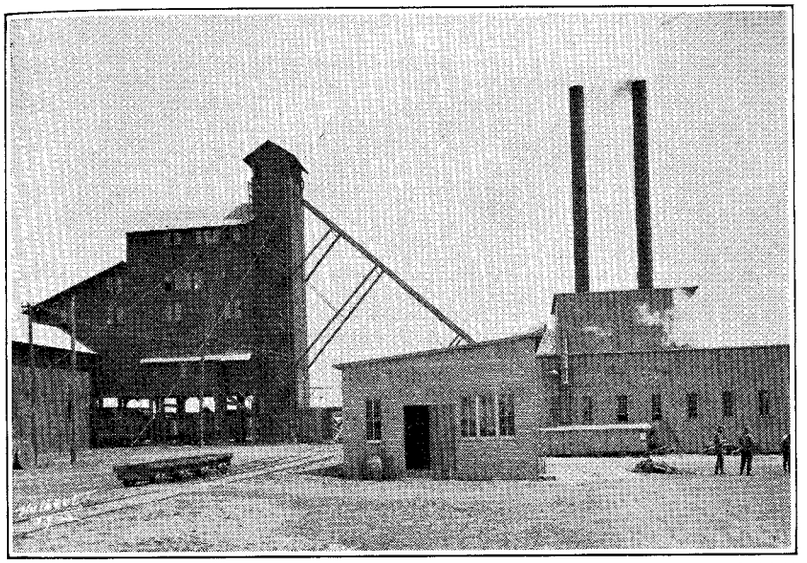
Coal Mining Began About a Hundred Years Ago

The presence of coal in Michigan was known through drilling records at least fifty years before the deposits were extensively

*See Chapter I, pp. 18, 20.

opened up for commercial exploitation. Many of the major discoveries of coal in the Saginaw basin were made during the early sixties in association with the drilling of salt wells. Developments in the coal industry were retarded because during the early days of lumbering operations there was an "inexhaustible supply of pine" which furnished the fuel then required to meet the limited demands of industrial activity.

According to the accounts of the Geological Survey of Michigan[9] the earliest coal mining operations were probably carried on in the vicinity of Jackson in 1835. Active mining of coal was also conducted on a small scale near Grand Ledge in the period from 1838 to 1839. Some small developments took place in the vicinity of Millets in Eaton County during 1858-59 and still later successful operations were begun at Williamston.



FROM THE DEPARTMENT OF CONSERVATION

47. MINE TIPPLE AND HOISTING HOUSE, RANDALL COAL MINE, NEAR MIDLAND

As the supply of pine slabs from the sawmills gradually diminished, a need developed for other sources of cheap fuel to supply the rapidly developing salt and other industries. In the period from 1895 to 1897 numerous coal mines were developed in the region around Saginaw, Bay City, and St. Charles. A few years later coal deposits were discovered in Huron, Tuscola, and Genesee counties, but these have since been largely worked out and the mines are now abandoned.

Peak of Activity Came Early in Present Century

In the period from 1900 through 1911 there were between 30 and 38 mines in operation in various parts of the state. The peak of production was reached in 1907 when 2,035,858 tons of coal were mined. In this year, however, the average price received for the

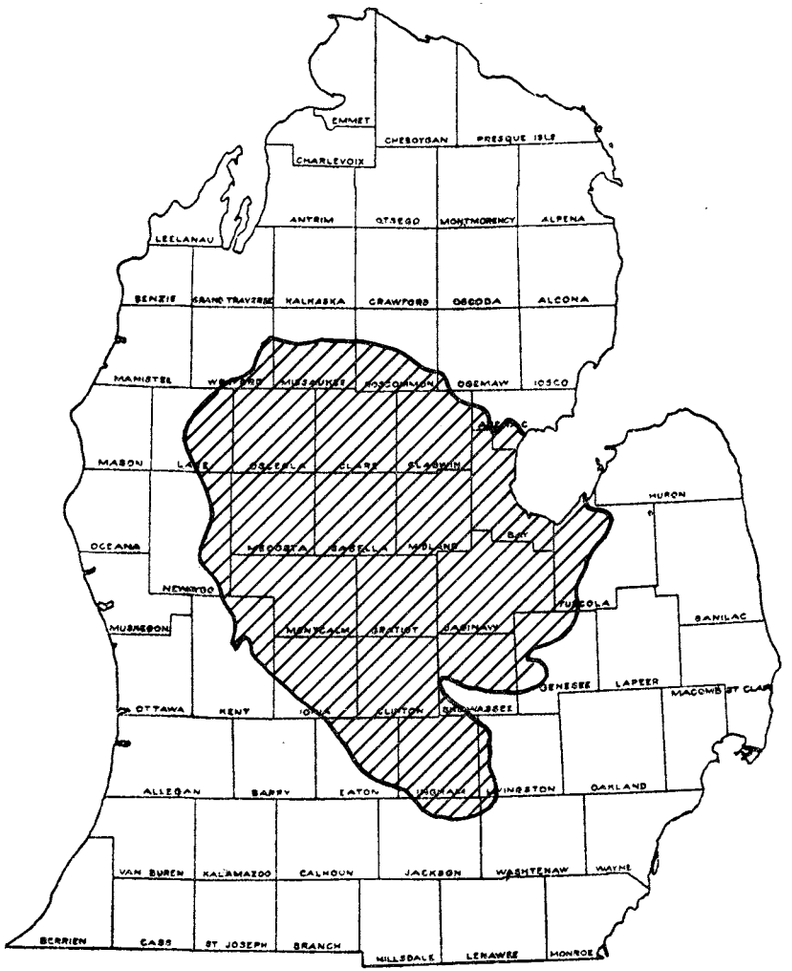


FIGURE 48. LOCATION OF THE COAL BASIN

coal at the mines was $1.80 per ton and the total output was valued at only $3,660,833. In 1920, the eighteen active mines of the state produced a total of slightly less than one and one-half million tons with a value of $7,346,000. During the depression, coal mining

slumped decidedly. Only a half dozen mines were in operation during the four years from 1928-1932. In 1931 the six major operating mines delivered a total of 359,403 tons valued at $1,094,000, the lowest production since 1900. A slight improvement in the industry was noted in 1933 when 13 mines on the active list produced 406,741 tons valued at $1,171,000. In 1935, there were about twenty mines in operation with a total production of 628,384 tons valued at $2,017,000.

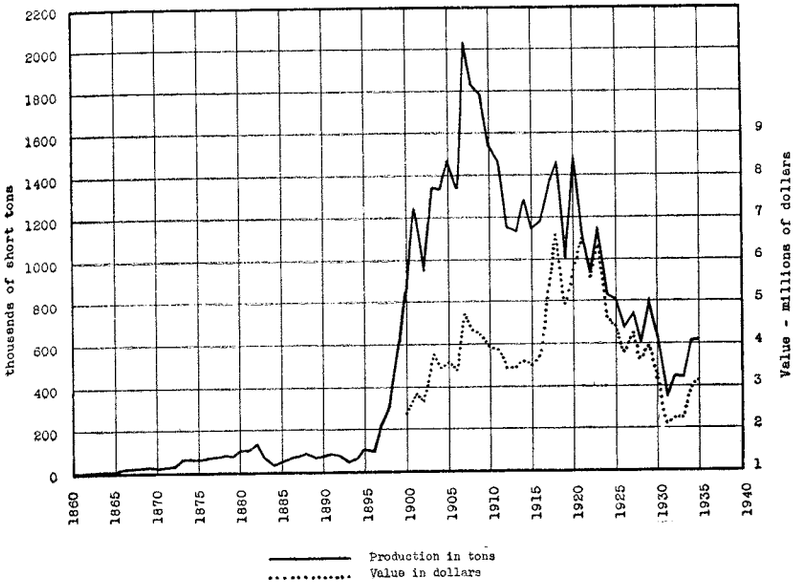


FIGURE 49. PRODUCTION AND VALUE OF COAL IN MICHIGAN

Characteristics of Michigan Coal

It is stated[10] that the Michigan "Coal Basin" comprises an area estimated to include from 6,500 to 11,000 square miles of territory covering all or parts of 29 counties in the central section of the Southern Peninsula, although only about one-third of the beds contain workable coal.[9]

Michigan coal is generally of lower grade and poorer quality than the competing coal from Ohio, West Virginia, and Pennsylvania. It is frequently weak and crumbly and thus tends to slack readily, a property which leads to serious difficulties in shipping and storage. Although the heat values of Michigan coal are relatively high, ranging from 12,500 to 13,700 B.T.U., there are certain properties such as

high sulphur and ash content which tend to place restrictions on its uses.

Most of the mines obtain the coal through underground workings from seams which vary in thickness from two and one-half to five feet. Except in regions where the coal lies near the surface it is unprofitable to mine beds with a thickness of less than 30 inches. In the vicinity of Grand Ledge and Williamston, however, thin seams of coal are mined by open pit methods as a by-product in the quarrying of shale which is employed in the manufacture of brick and tile. During the depression small open pit mines were opened up for the production of coal in the vicinity of Williamston, Mason, and other localized areas.

Although the mining of coal has been an established industry in Michigan for over a hundred years there remain some reserves which have not yet been touched. Much of this reserve coal lies too deeply buried or is found in seams too thin to warrant development under present market conditions.

Oil and Gas

Origin of Petroleum

Geologists are quite generally agreed that petroleum is generated by natural distillation of organic matter included in sediments laid down in ocean basins. Through biochemical changes caused by bacteria the cellulose of the organic material is altered to waxes and fats. The globules of oil thus set free are dragged down to the bottom of the sea along with minute particles of gelatinous (colloidal) clay and lime. These fine sediments are compressed to form stratified oil-bearing deposits of dense bituminous shale and limestone.

The great pressures eventually developed allow the oil to be squeezed out into adjacent layers of porous rock. Once the oil is in the porous rock it is free to migrate either alone or with water and always tends to seek its highest level. If buoyed up by water the oil eventually moves into natural sealed reservoirs where it is gathered into pools.

How Oil Reservoirs Are Formed

Petroleum and gas usually accumulate in the upfolds or anticlines of folded areas, the gas in the summits of the folds and the oil immediately below being held in by the underlying water. The reservoir rock in which the petroleum and gas accumulate must be of a porous

material, such as sandstone or fractured limestone. This in turn must be underlain and capped with impervious beds, such as shale, to prevent escape of the lighter oils and gas.

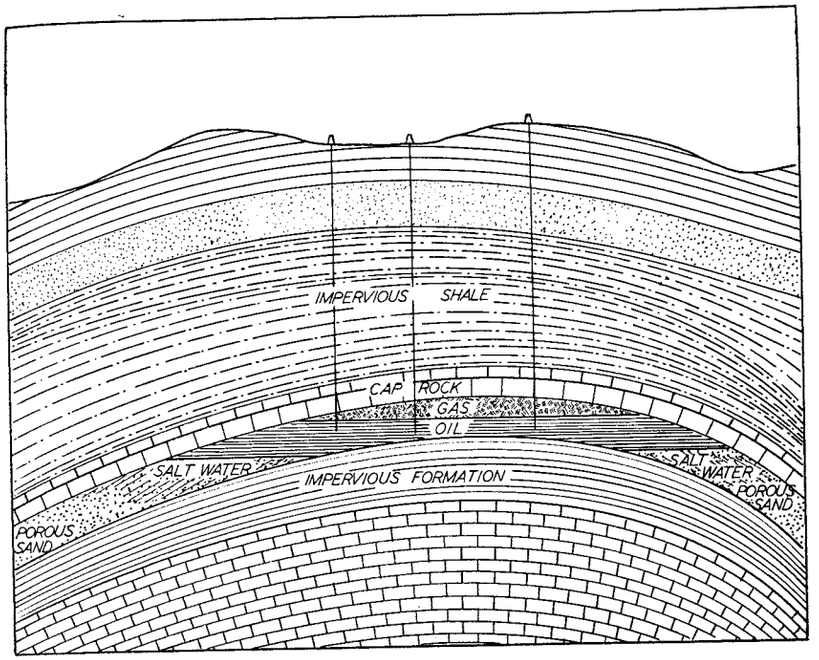


FIGURE 50. AN ANTICLINAL STRUCTURE AND THE RESERVOIR CONDITIONS ESSENTIAL TO THE ACCUMULATION OF OIL AND GAS

Natural Gas Important in an Oil Field

Although gas may occur in a reservoir without oil, it is a rare situation to have oil without gas. It has been estimated that fairly productive sands may contain from 6 to 12 pints of oil to the cubic foot, of which not more than 25 per cent is obtainable unless gas is present to move it under pressure through the pores of the rocks.

Gas is an extremely important agent in oil fields and every effort should be made to conserve and utilize it to the maximum. It functions to decrease viscosity in the oil and to increase the flow of the oil globules through the reservoir rock. Most important of all, the gas in the reservoir supplies the energy necessary to lift the oil from the deeper rock formation to the surface. But as the gas is used up or wasted, pressures in the reservoir decline and expensive pumping operations must eventually be resorted to in order to bring the oil to the surface.

Since gas volume and pressure are so essential for withdrawing oil from the pools, it is important that measures be taken to prevent waste. The gas available in the field should be utilized so as to force the maximum amount of petroleum through the rock and still maintain the highest possible gas-oil ratio of production.

The Petroleum Industry in Michigan

For a number of years prior to 1920, according to Robinson[16] "petroleum in Michigan was produced from a few wells in the Port Huron area. The wells were very small with an initial yield of from three to seven barrels per day, but the yield rapidly decreased to an average of one-half barrel per day."

Smith[18] points out that early explorations for oil in the Port Huron area were begun in 1886. In this period to 1911 about 22 wells were drilled to the west and northwest of the city and the first commercial production of oil in the state was obtained. The oil in this field was obtained from the Dundee formation* at a depth of 500 to 650 feet. The estimated maximum production of oil from the Port Huron field was 70 barrels per week. By 1920 the output had declined to such an appreciable extent that the wells were abandoned.

The Saginaw Field

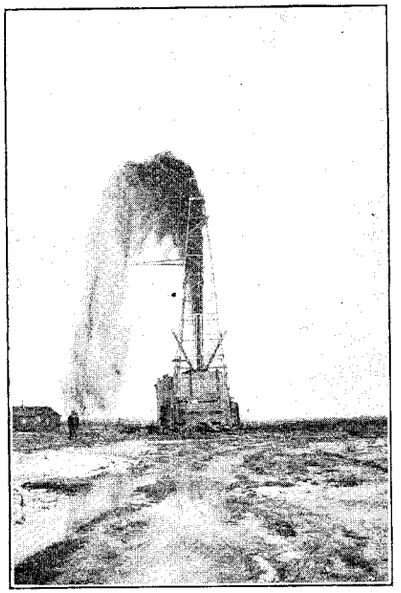
Although the possibility of oil in the Saginaw region was pointed out as early as 1902, no tests for oil were made until 1912. In that year a group of business men in Saginaw organized a company and financed the drilling and completion of 10 wells.

Unfortunately, these wells were all drilled just outside of the oil bearing formations, so that production was negligible and the operations were abandoned. In 1925, the Saginaw Prospecting Company drilled a few wells north of the city limits of Saginaw and brought in the first commercial production for that field. The excitement created by this early success was responsible for an oil boom which led numerous other companies to enter the field. By June 1, 1927, 190 wells had been completed and the field was producing its maximum of approximately 1400 barrels per day. A total of over 300 wells were finally drilled in but the output continued to decline rapidly.

The productive life of the Saginaw oil field was relatively short. Because of the extremely rapid development of the oil industry in the Saginaw area, the state was unable to draft and put into effect

*See Chapter I, p. 18.

regulatory measures and laws for the control of drilling operations until it was too late to do any good. Much of the producing oil area was situated directly under the city which led to the wasteful practice of town-lot drilling and excessively close spacing of wells. In some of the area within the city limits the wells were so close together that legs of adjacent derricks intersected each other. Naturally enough, each individual who owned a plot of land in the proven area was interested in having his own oil well and the chief thoughts in the minds of owners, promoters, and operators were those motivated by personal gain.



FROM THE DEPARTMENT OF CONSERVATION

51. AN OIL WELL RIG

Development of the Saginaw Field an Extravagant Venture

Development of the oil industry in the Saginaw field proved to be a costly and extravagant venture for all who were engaged in its activities. The 300 or more wells which were ultimately completed represented an average investment of practically $10,000 per well. There is no question but that 50 wells systematically spaced in the field could have produced as much or more oil than the 300 which were actually drilled. The natural gas contained in the reservoir was either blown out into the atmosphere or otherwise wantonly destroyed in the wasteful methods employed in drilling. Consequently the pressure in the reservoir was reduced to the point where

the oil refused to migrate through the pores of the rocks or to be lifted to the surface under natural pressure. It is doubtful if more than 25 per cent of the available oil in the rock reservoir in the field was actually recovered. The remainder lies "frozen" in the pore spaces and in all probability will never be retrieved.

Oil in the Saginaw field was obtained largely from the Berea sandstone* at a depth of slightly more than 1800 feet. Some small production was obtained also from the Traverse and Dundee formations. The wells in the field came in with an initial production of 10 to 90 barrels per day, although one well in the Traverse formation was brought in with an initial output of 500 barrels during the first 24 hours.

In the fall of 1934 a new field was opened up near Birch Run in the southeastern part of Saginaw County. Within the period of a year 19 Berea wells were completed in the area with a daily production exceeding that of the 83 wells then producing oil in the original Saginaw field.

The Muskegon Field Develops Early

The Muskegon oil field began commercial production in December, 1927. In the early stages of development of the field the oil was obtained largely from near the top of the Traverse formation* at depths of 1620 to 1680 feet. In 1928 deeper drilling resulted in the discovery of a much more prolific horizon, the Dundee, about 400 feet below the Traverse formation. Excitement created by large flows of oil and gas from the Dundee formation stimulated drilling activities and by August, 1929, the field had reached its peak of production with an average daily yield of 18,570 barrels. In May, 1932, the average production of the district had declined to 1160 barrels per day and by 1936 the average production had decreased to 280 barrels per day. Newcombe[11] states that "the largest oil well in the Muskegon district produced about 3000 barrels daily and the largest gas well had an initial flow of 25,000,000 cubic feet". The gas was obtained largely from the upper Traverse formation.

The Muskegon field was developed in much the same way as was that of the Saginaw district. A portion of the field was situated in an area which had been subdivided into town lots. Town-lot drilling resulted in close spacing of wells and a consequent overdrilling of the area. Because of inadequate facilities for handling the gas and the lack of a substantial market to absorb the rapidly growing production much gas was wasted and the life of the field was greatly shortened.

*See Chapter I, p. 20.

Central Michigan Field Extends over Several Counties

The Central Michigan Area consists of a number of individual pools centered largely around the city of Mt. Pleasant and scattered through various parts of Mecosta, Isabella, Midland, Gratiot, and Montcalm counties. This district includes the Mt. Pleasant and East Extension, Porter, Yost-Jasper, Vernon, Leaton, Crystal, Edmore, and Beaverton oil pools and the Austin, Clare, Broomfield, and Six Lakes gas fields.

The discovery well in the district was completed in February, 1928 with an initial production of 100 barrels per day. This well was located in Midland County about 10 miles east of the city of Mt. Pleasant. Drilling soon became very active and the field developed rapidly. Oil in the Mt. Pleasant area is obtained largely from the Dundee formation at an average depth of approximately 3500 feet. The most spectacular development in the Central Michigan area was the discovery of the East Extension (May, 1931). This field has been one of the most productive in the state. The Porter field, discovered late in 1931, at the end of 1935 had produced more oil than any other field thus far developed, practically one-third of the total production of the state up to that period. The Crystal field came into commercial production with the completion of the Durbin well in March, 1935 with an initial flow of 3900 barrels per day. In his report on the Crystal Field, Eddy[5] makes the following statement: "From the completion of the discovery well to May, 1937, 123 oil wells, 6 gas wells, and 46 dry holes have been drilled. At the present time May, 1936, there are 24 wells drilling or completing in the area. By May 1, 1936, 4,839,565 barrels of oil had been produced and the field had an average daily production of 8,100 barrels."

The West Branch Field

The West Branch Field in Ogemaw County[12] was discovered in 1933 and next to the Central Michigan area just described was the most productive in Michigan. The total production to August 1, 1936, was 1,083,383 barrels. The 128 active wells on that date were producing about 2300 barrels or an average of 18 barrels per well per day.

Production Fluctuates

In the period of fifty years since the discovery of the first commercial production in the Port Huron area, the petroleum industry in the state has grown to one of considerable importance. In 1935, Michigan produced 15,776,237 barrels of oil and ranked eighth

among the oil producing states. During the last quarter of that year the daily average production was greater than that of Pennsylvania, and Michigan became the leading oil producing state east of the Mississippi. During 1936, however, there was a rather serious decline in production but new areas opened up within the last six months give promise of adding considerable to the future output.

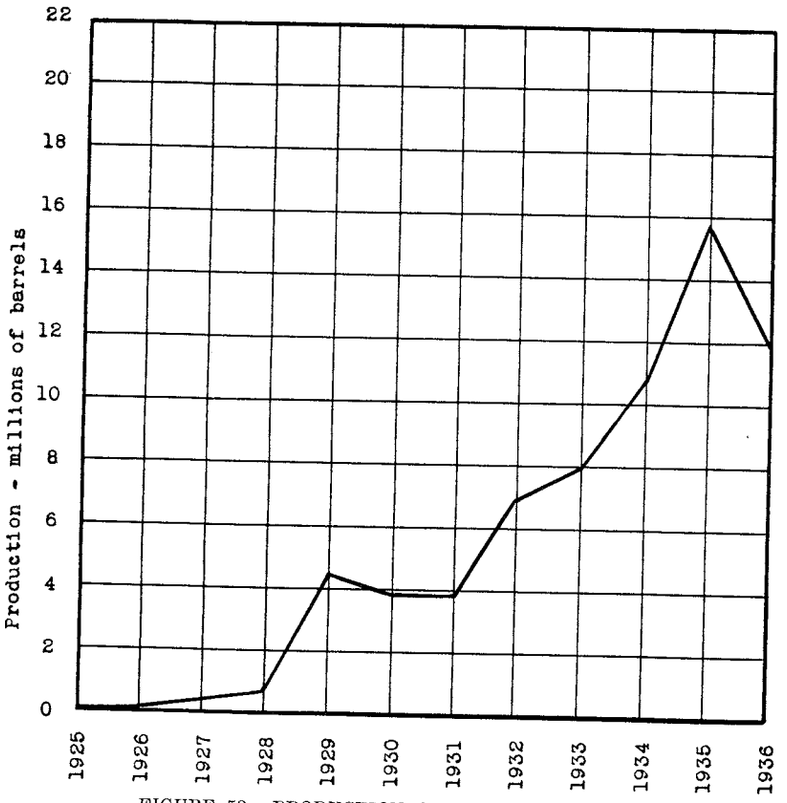


FIGURE 52. PRODUCTION OF OIL IN MICHIGAN

It is the consensus of opinion among the geologists engaged in the job of finding oil bearing structures that the vast reserves of oil in the state have to date been merely touched. The deeper formations give promise of oil and undoubtedly will be developed when the shallow resources have been exhausted. Already the state and the United States Geological Survey are working cooperatively to locate, by electrical methods, these new areas.

Since the development of the original Saginaw field, the state has made rapid strides in placing the oil industry on a substantial basis

and has enacted certain laws which will provide for a far-reaching conservation program. Representatives of the major oil companies realize that the future welfare of the industry in Michigan is dependent upon strict regulation and the enforcement of laws to prevent wastage.

The original policy of drilling expensive offset wells was one of the most extravagant practices in the industry. The most effective remedy to combat the too close spacing of wells and consequent overdrilling in a producing field is a cooperative plan of unitization. A great deal of money which now goes into the well drilling program could be piled up as profit if owners within the limits of a proven field would pool their acreage, drill only a limited number of wells and prorate the expense of development and the returns of production. Such a program, built up on good faith and removed from selfish motives, would be a step forward in the general plan of conservation of natural resources.

Natural Gas in Michigan

The history of the natural gas industry in Michigan is related closely to the development of oil production. The reservoirs of gas which have recently been developed for commercial production were in large measure discovered in fields which were originally drilled for the purpose of finding oil. Mention has already been made of the unwise utilization of gas in the Saginaw field. In the development of the original Muskegon field a limited supply of natural gas was piped to the city of Muskegon to be used for commercial purposes. Still larger amounts were wasted because of extravagant practices employed in drilling, together with utter disregard for conservation policies.

The commercial utilization of natural gas has developed slowly due to uncertainty as to available supplies and the lack of pipe line facilities to transport the gas from the fields. As new areas were opened up it became apparent that the potential reserves in the state were adequate to justify the construction of transmission lines to supply nearby markets with this fuel.

Today a large amount of "dry" gas for commercial purposes is being obtained from the Michigan "stray sand" which lies about 2000 or more feet above the oil producing Dundee limestone. The most important gas producing fields of the state may be listed as follows:*

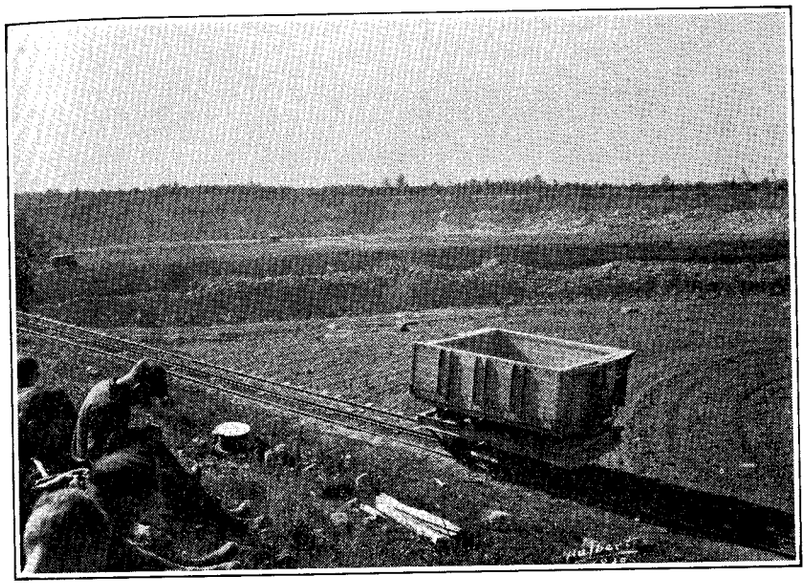
*Based on information available May 1, 1937.

1. The Austin Field with 21 producing wells is serving the cities of Muskegon and Big Rapids. To the close of January, 1937 a total of 2,438,220,700 cubic feet of gas had been withdrawn.
2. The Broomfield Field had 48 wells on proration on January 31, 1937, and is supplying gas to Saginaw, Bay City, and Midland. The total withdrawal from the Broomfield reservoir at the end of January, 1937 was 4,334,770,500 cubic feet.
3. The Clare Field to the close of 1936 had produced 270,540,300 cubic feet of gas serving the cities of Mt. Pleasant and Clare. Five wells were in production on that date.
4. The Ferris-Crystal Field with five wells on proration at the close of January, 1937 had produced a total of 84,022,200 cubic feet of gas. The gas from this field was used principally in Alma.
5. The Six Lakes field in Hinton, Millbrook, and Belvidere townships had 206 wells on proration on January 31, 1937. The total volume of gas withdrawn to that date was 2,776,028,700 cubic feet. Lansing, Grand Rapids, Saginaw, and Bay City were connected up to the field.
6. The Leaton Field on January 31, 1937, was producing gas from five wells. A total of 78,647,000 cubic feet had been withdrawn for utilization in the city of Mt. Pleasant.
7. The East and West Vernon Fields together had 12 wells on proration on January 31, 1937. 983,757,000 cubic feet had been withdrawn from the area and sent to market in Mt. Pleasant.
8. The New Haven-Sumner Field with 33 wells on proration had produced 208,147,200 cubic feet of gas to the close of January, 1937. This field is connected up to the pipe line which supplies gas to Lansing and Grand Rapids.
9. The Ravenna Field recently opened up near Muskegon with nine wells on proration at the end of January, 1937 had supplied 40,799,900 cubic feet of gas to industries in Muskegon in addition to the 54,856,900 cubic feet which had been withdrawn from the old Muskegon Field to the close of 1936.

The Newest Major Enterprise

The oil and gas industry is one of the newest of the major enterprises in Michigan. It has been responsible for the rejuvenation of a large area in the central part of the state. Extensive drilling

operations, the construction of pipe lines for transmission of gas, the development of refining plants, and many other activities directly related to the petroleum industry combined to instill new life in a region which otherwise would have suffered untold hardships during the recent depression. The oil producing areas of the state experienced their greatest boom at a time when other industrial and manufacturing centers were in distress. Many of the oil and gas fields of the state have developed in areas of marginal and submarginal land where agricultural pursuits had been difficult and unrewarding. With the discovery of oil and gas, property values increased and business flourished.



FROM THE DEPARTMENT OF CONSERVATION

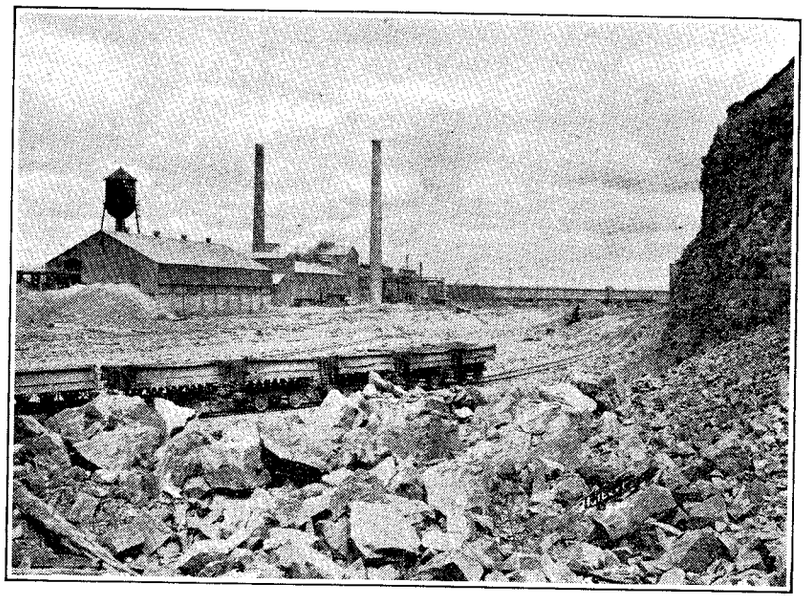
53. LIMESTONE QUARRY, MICHIGAN ALKALI COMPANY, ALPENA

Limestone and Dolomite in Michigan

Although the occurrence of vast deposits of limestone in Michigan has been known since the days of early explorations,* the actual development of the industry did not take place until late in the nineties when it was stimulated by activities involved in the manufacture of cement. The early history of the industry dates back to the burning of limestone in the southeastern part of the state. A number of kilns were erected as early as 1850, in the region of Monroe and Dundee in Monroe County, for the purpose of supplying

*See Chapter I, p. 18.

lime to the markets of Detroit and other nearby cities. Other small kilns for burning lime were erected later in the vicinity of Bellevue and Jackson. These early lime-burning industries were developed chiefly in areas where abundant supplies of wood were available to provide fuel for the operations. With the removal of the forests in the southern part of the state and the consequent settlement of new territory to the north, quarry operations, on a small scale at first, were begun in the region of Thunder Bay and Little Traverse Bay.



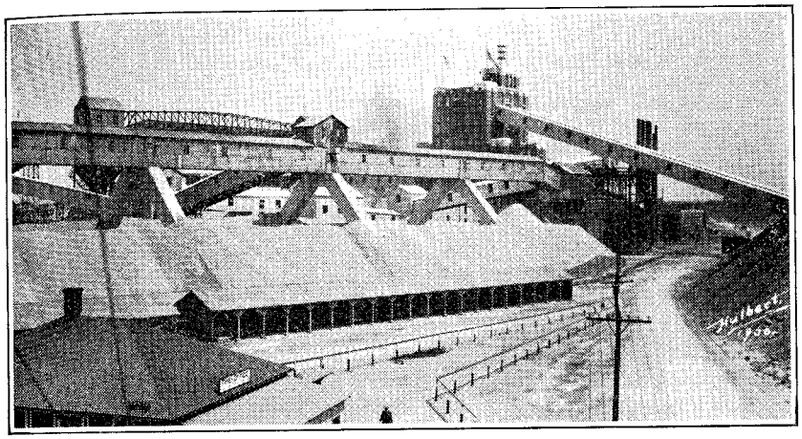
FROM THE DEPARTMENT OF CONSERVATION

54. LIMESTONE QUARRY AND CEMENT PLANT. PORTLAND CEMENT COMPANY, PETOSKEY

The development of the cement industry in the period from 1899 to 1903 was a real stimulus to the limestone operations in the state and several small quarries were opened up at that time to supply growing needs for the material. Owing to the fact that many of the early cement plants of the state utilized marl instead of limestone in the manufacture of the product, the limestone industry was slow in making definite progress. Smith[17] states that in the period between 1899 and 1901, the so-called "boom" years of the Portland Cement industry in Michigan, twenty companies were organized for the purpose of manufacturing cement from marl. Only ten of the companies reached the productive stage and but five were in operation when his report was written in 1915. In the period from 1896 to 1915 thirty-four different cement plants had been projected or

built in the state but only twelve were actually producing cement in 1915.

In his elaborate report on marl, Hale[7] presents a very interesting picture of the origin and occurrence of marl and its use in the manufacture of cement. During the early stages of its history the marl-cement industry flourished. But when the rotary kilns, with their much greater capacities, finally replaced the old vertical kilns it was found more economical to employ ground limestone and the use of marl became a subordinate factor in the cement industry. At the present time there are only three plants in the state which make any attempt to utilize marl in the manufacture of cement. Two of these plants are located at Coldwater and the third is at Fenton.



FROM THE DEPARTMENT OF CONSERVATION

55. CRUSHING AND DISTRIBUTING PLANT, MICHIGAN LIMESTONE AND CHEMICAL PLANT, ROGERS CITY

Many Industries Use Limestone Products

Limestone has a variety of uses and finds its way into many channels of industrial activity. Michigan limestones, by virtue of their high purity, are especially adapted for use in the manufacture of chemicals and as a blast furnace flux in the manufacture of steel. According to Poindexter[15] approximately 50 per cent of the limestone produced in Michigan is sold for flux, which means that the industry in the state reflects to a large degree the activities in the steel mills. A large portion of the limestone quarried is employed in the manufacture of Portland cement which is utilized in the building trades and for road construction. Considerable quantities of Michigan limestone are used in the manufacture of calcium carbide, alkalies, and various chemical compounds. Because of the relative

thinness of individual beds and the jointed and fractured character of the formations, it is difficult to obtain large blocks of the stone suitable for construction purposes.

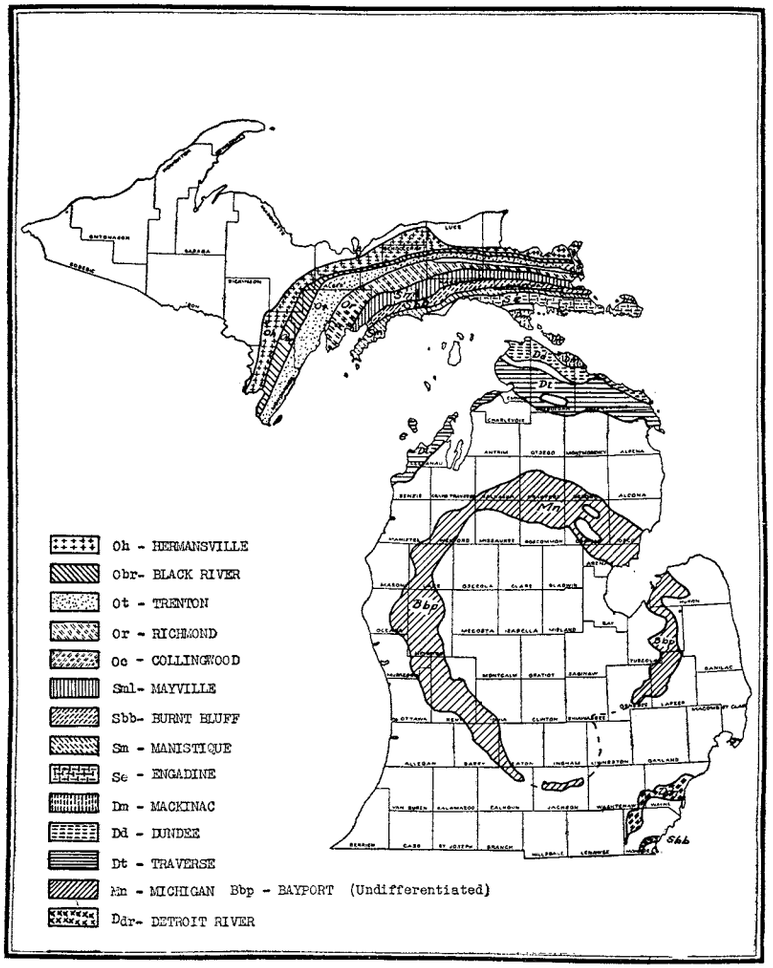


FIGURE 56. AREAL EXTENT OF LIMESTONE AND DOLOMITE FORMATIONS

Large deposits of high-grade limestone and dolomite occur in many areas throughout the state. Quarrying operations, however, are more or less restricted to those localities near the shores of the Great Lakes where facilities for cheap transportation by water are available. The most important quarry operations in the Southern Peninsula are located at Afton, Alpena, Bayport, Monroe, Petoskey,

Presque Isle, Rogers City, and Sibley. In the Northern Peninsula, pure dolomite is being quarried from an extensive belt of exposed formations in Chippewa, Mackinac, and Schoolcraft counties. Minor operations are centered in Delta and Dickinson counties.

Revival of Trade Will Bring Increased Production

In 1933 Michigan ranked third among the states in volume of production but sixth in value owing to the low prices received for fluxing and chemical limestones. The peak of production was

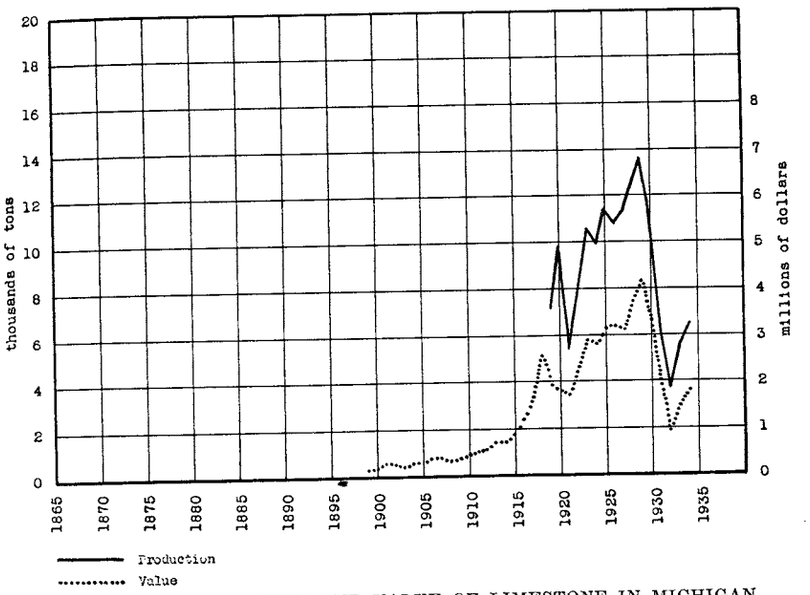


FIGURE 57. PRODUCTION AND VALUE OF LIMESTONE IN MICHIGAN

reached in 1929 when a total of 13,572,010 tons of limestone valued at $8,425,261 was sold on the market. During the depression years of 1931 to 1934 the limestone industry suffered a decided setback with production less than half normal. In 1935 Michigan produced 8,175,430 tons of limestone valued at $4,159,915. Renewed activities in the building trades, steel industry, road construction, and chemical plants, will undoubtedly be reflected in a revival of the limestone industry and a consequent increase in production.

Michigan's deposits of high grade limestone and dolomite are of sufficient extent to insure a long time activity. The future of the industry in the state is well protected by virtue of the fact that extensive workable deposits are situated in close proximity to cheap

lake transportation. The opening up of large quarries in the interior deposits of the state will undoubtedly be limited by freight charges in rail transportation.

Gravel and Sand

The most important sources of gravel and sand* in Michigan are found in association with deposits formed by the activities of waters which flowed out from the melting ice during the recession of the glaciers which at one time covered this section. The commercial gravels are obtained chiefly from stratified deposits which were laid down in the form of outwash plains, valley trains, eskers, kames, and lacustrine plains.

Where Gravel Is Found

With the exception of valley trains, which are, for the most part, localized in old pre-glacial valleys in certain restricted areas of the Northern Peninsula, these features are widely distributed throughout the state and afford readily accessible supplies of reasonably cheap gravel and sand for the general construction and road building markets.

Outwash plains are generally level deposits of interbedded gravel and sand usually of widespread extent and constitute in large part the so-called "jack pine plains" of the state.

Valley train deposits are composed of stratified sand and gravel usually developed in the form of long, tenuous trains of sediment which may extend for miles down the valley ways. Valley trains are of common occurrence in various portions of the western half of the Northern Pensinsula and are especially well developed in the Crystal Falls-Iron River section of Iron County.[1]

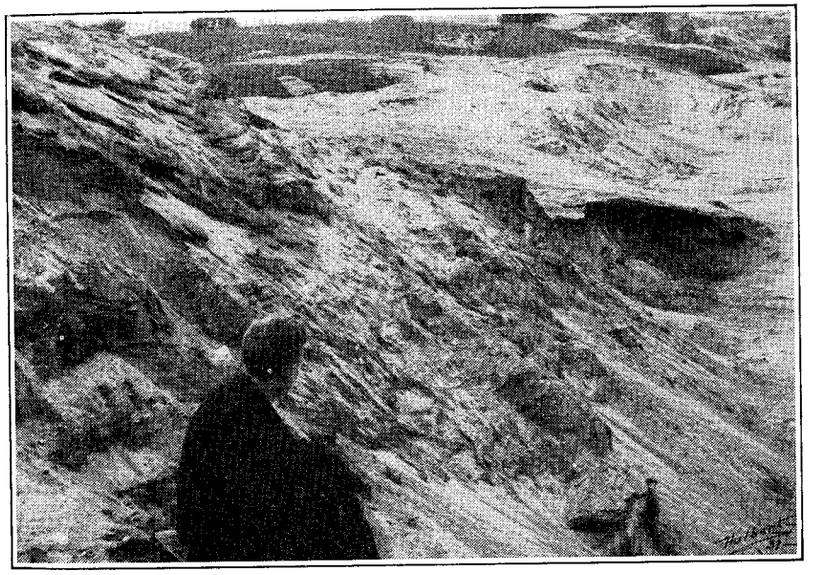
Eskers are long narrow strings of sand and gravel, commonly referred to as "hogbacks" or "Indian trails". The most noteworthy example is the Mason esker which has its source in Mount Hope cemetery near Lansing and extends southward as a serpentine ridge for a distance of practically twenty miles through and slightly beyond the town of Mason.

Kames are small rounded knobs of stratified sand and gravel somewhat restricted in extent which contribute important supplies of assorted material suitable for road construction and other commercial purposes.

*See Chapter I, pp. 22 and 31.

FROM THE GEOLOGY DIVISION, MICHIGAN STATE COLLEGE

58. ALTERNATING BEDS OF GRAVEL AND SAND IN VALLEY-TRAIN DEPOSIT, BERKSHIRE CAVE, NEAR IRON RIVER



FROM THE GEOLOGY DIVISION, MICHIGAN STATE COLLEGE

59. SECTION OF MASON ESKER, SOUTHEAST OF LANSING, SHOWING STRATIFIED LENSES OF GRAVEL AND SAND

The *lacustrine* deposits of sand and gravel are so named because they were formed in the beach lines, off-shore bars, and wave-built shores of former lakes. They occur as long, tenuous ridges which may extend for miles across the level stretches of old abandoned lake plains.

FROM THE GEOLOGY DIVISION, MICHIGAN STATE COLLEGE

60. A CHAIN OF GLACIAL KAMES, NORTHEAST OF BATH

Michigan Sand and Gravel Used in Making Concrete

A large percentage of the gravel and sand produced in Michigan is used in the manufacture of the concrete employed in highway and building construction. It may well be said that Michigan owes its splendid network of highways to the widespread occurrence and relative abundance of gravel deposits.

Extensive undeveloped deposits of gravel and sand scattered over the surface of the state assure for Michigan a supply adequate to meet the ever increasing demands of future industrial growth and development. The Geological Survey in cooperation with the Highway Department of the state is constantly searching out commercial deposits in those areas where new highway systems are being projected.

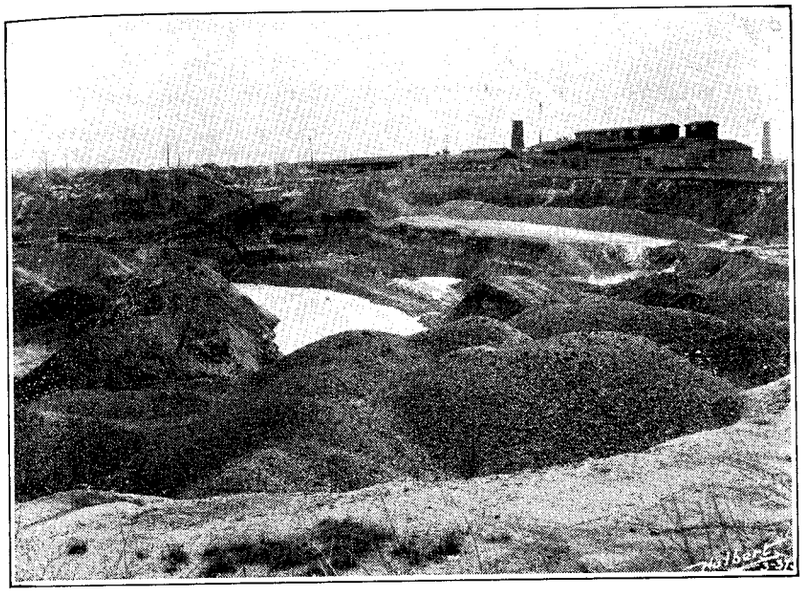
Shales

Shale Used in Manufacture of Vitrified Products

Shale may be defined as consolidated clay or mud. It is formed of finely divided colloidal material deposited in basins such as oceans and lakes. Shale deposits of marine origin are widely distributed throughout much of the Southern Peninsula, but surface exposures of workable beds are somewhat limited. The shale deposits of Michigan are used largely in the manufacture of vitrified products such as brick, tile, and pottery, and to a great extent in the cement industry. The most important sources of commercial shale in the Southern Peninsula are found in the Bell, Antrim, Bedford, Coldwater, and Coal Measure formations.*

*See Chapter I, pp. 18-20.

The Bell shale is a soft blue shale, plastic in character. It occurs in beds ranging in thickness from 60 to 80 feet and appears in outcrops in various localities in Alpena and Presque Isle counties. Brown[3] states that "the Bell shale is fine grained and plastic and seems to be suitable for brick, tile and possibly some pottery uses where a red burning clay is not objectionable". The Bell shale exposed in the vicinity of Alpena was at one time quarried and utilized by the Huron Portland Cement Company in the manufacture of cement. At present it is not used for this purpose.



FROM THE GEOLOGY DIVISION, MICHIGAN STATE COLLEGE

61. BRICK PLANT AND SHALE QUARRY, WILLIAMSTON

The Antrim-Bedford shales are black at the bottom and generally grade into a bluish and grayish color at the top. They frequently contain pyrite which is responsible for the rusty hues assumed by the material upon weathering. The Antrim-Bedford shales vary in thickness from 150 to 575 feet. They are exposed as outcrops in Charlevoix, Antrim, Emmet, and Cheboygan counties. Antrim shale is quarried at Paxton in Alpena County for use in the manufacture of cement by the Huron Portland Cement Company. Bedford shale, obtained from the Ellsworth quarry in Antrim County, is utilized in the cement industry of the Petoskey Portland Cement Company near Petoskey and the Newaygo Portland Cement Company at Newaygo. According to Poindexter,[15] "tests show the Antrim shale to be good material for common brick, face brick and tile if treated to develop

plasticity and carefully burned". Brown[3] states that "the lower shale is bituminous and must be carefully oxidized in burning".

The Coldwater formation is the thickest series of shale beds in Michigan. It ranges from 700 to 1000 feet in thickness. The shale is typically blue gray to greenish in color, although dark gray beds occur locally. The Coldwater shales are exposed near water level along the shore of Lake Huron between Forestville and White Rock. In Branch County it is quarried at Coldwater and Union City for use in cement manufacture. The shale possesses chemical and physical properties which make it suitable for the manufacture of brick and tile.

The Coal Measure shales of the Saginaw formation are exposed in the vicinity of Grand Ledge, Jackson, Corunna, and Williamston where they are employed in the manufacture of various types of vitrified products. Where they occur in sufficient quantities these shales are invariably suitable for brick, tile, and similar vitrified products.

Clays

Clays are widely distributed through various parts of both peninsulas. The *lacustrine* clays, formed in basins of present or former lakes, are usually stratified and in many areas the beds contain thin layers of silt and fine sand. Relatively pure deposits of these clays are found in the beds of the ancestral Great Lakes and in some localities are of sufficient extent to be commercially important. They are, as a rule, surface deposits, often highly plastic and suitable for brick and earthenware.

Glacial clays were deposited in the wake of melting ice sheets. They are variable in chemical composition and physical properties and usually occur in deposits which consist of inter-mixtures of all types of material ranging from the finest rock flour to boulders which measure many feet in diameter. Clays of glacial origin are usually tough, dense, and gritty and quite often contain numerous pebbles and larger stones. Workable deposits of pure, plastic glacial clays are relatively small and of little commercial value.

The deposits of marine shales and of lacustrine and glacial clays in Michigan have been exploited only in those areas where developed markets are near at hand. Vast potential reserves of high grade commercial shales and clays lie so far removed from possible areas of consumption that no attempt has been made to utilize them. Long transportation hauls place a prohibitive cost on both raw material and the manufactured products.

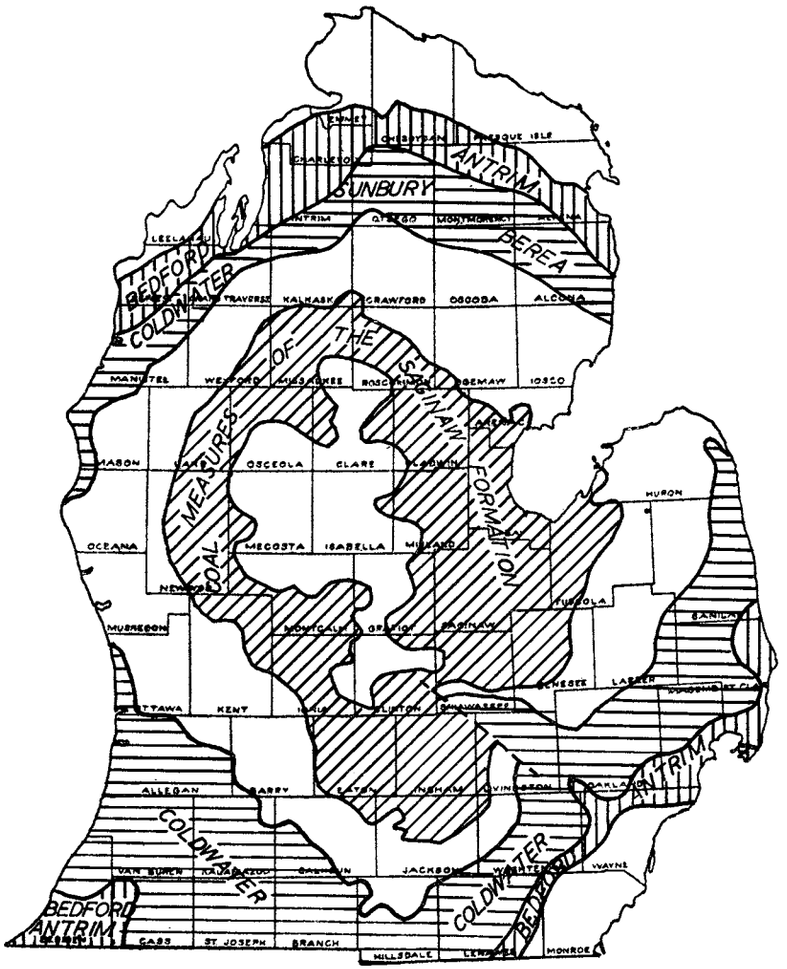


FIGURE 62. EXTENT OF SHALE FORMATIONS
There is no shale in the Upper Peninsula

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CHAPTER FIVE

THE PEOPLE OF MICHIGAN

by J. F. Thaden
Assistant Professor of Sociology
Michigan State College

Population Characteristics

The population of Michigan has grown very rapidly. When Michigan was admitted as a state in 1837 it had a population of 175,025. The half-million mark was reached about 1854, the million mark by 1866, the two million mark by 1888, the three million mark by 1913, and the four million mark by 1925. The population on April 1, 1930, according to the Fifteenth Census of the United States Bureau of the Census was 4,842,325.

The phenomenal growth before and for several decades after the Civil War was associated with the development of the farming and lumbering industries. The very rapid growth since 1910, more than twice that of the rest of the country, was due largely to the development of the automobile manufacturing industry. While the white population nearly doubled during the past two decades the Negro population increased ten-fold. The urban population (those living in incorporated places of 2500 or more inhabitants) has increased from less than one-half of a million (405,412) in 1880 to nearly three and one-third million (3,302,075) in 1930. The rural population increased much more slowly. Whereas in 1890 Michigan's population was almost two-thirds rural, it is now more than two-thirds urban.

The population is becoming very unequally distributed. The densely settled areas are becoming more densely populated and most of the sparsely settled regions are becoming still more thinly populated. The foreign-born have comprised a gradually diminishing proportion of the total population since 1890. The excessive numerical predominance of males in the state throughout its history reflects its lumbering, mining, and manufacturing conditions. The city has a much larger proportion of people in the economically productive years, 20 to 45, than has the farm,—44.3 per cent as compared with 28.7 per cent. Rural areas are usually heavily loaded with people in the younger age groups. The contribution which farm people have made to the productivity and prosperity of the cities is very great inasmuch as farm families feed, clothe, educate,

and provide medical care for tens of thousands who, after being thus supported during their economically unproductive years, migrate to the urban centers when they are ready to embark upon their life work.

Number of People

Table 1 shows the population of Michigan from 1840 to 1930 and the increase during each decade.

There are numerous factors which indicate that Michigan, like the rest of the United States, is entering upon an era of much slower population growth. The immigration restriction acts passed during the decade 1920-1930, the tendency toward declining natural increase, and any permanent policies developed by the Resettlement Administration will affect population growth, distribution, and changes in the composition of population in Michigan as well as in most other states. Some studies on future population indicate that the peak of the nation's population will be reached in about fifty years at around 155 million.

TABLE 1.—Population of Michigan from 1840 to 1930

	Population	Increase Over Preceding Census	
		Number	Per Cent
1840	212,267	.....	.....
1850	397,654	185,387	87.3
1860	749,113	351,459	88.4
1870	1,184,059	434,946	58.1
1880	1,636,937	452,878	38.2
1890	2,093,890	456,953	27.9
1900	2,420,982	327,092	15.6
1910	2,810,173	389,191	16.1
1920	3,668,412	858,239	30.5
1930	4,842,325	1,173,913	32.0

(Source: U. S. Bureau of the Census. Unless otherwise noted, all data pertaining to population appearing in this chapter are taken from U. S. Census reports)

The population of Michigan has been a constantly increasing proportion of the total population of the United States, except from 1890 to 1910. It comprised 1.2 per cent of the total population of the United States in 1840 and 4.0 in 1930, as indicated in *Table 2*.

It is impossible to predict whether or not the population of Michigan will continue to grow faster than that of the rest of the country, as it has in the past. Certainly no longer will the population of the state double every 12 to 35 years as it has since 1840. A slowing down of population growth will require many readjustments especially in the philosophy of our relationships to our fellow citizens and neighbors. In urban centers competition among business men for customers will be intensified. In the open-country, values of

TABLE 2.—Population of United States and of Michigan: 1840-1980

Census	United States	Michigan	Per Cent Michigan is of U.S. Population
1840	17,069,453	212,267	1.2
1850	23,191,876	397,654	1.7
1860	31,443,321	749,113	2.4
1870	38,558,371	1,184,059	2.9
1880	50,155,783	1,636,937	3.2
1890	62,947,714	2,093,890	3.3
1900	75,994,575	2,420,982	3.2
1910	91,972,266	2,810,173	3.1
1920	105,710,620	3,668,412	3.5
1930	122,775,046	4,842,325	4.0
1940*	133,000,000	5,400,000	4.0
1960*	150,000,000	6,000,000	4.0
1980*	155,000,000	6,200,000	4.0

*Based on Warren S. Thompson and P. K. Whelpton, "Population Trends in the United States", (1933) pp. 315-20

farm land will be based more on its earning power and less on its potential speculative values. No longer will so many evils of careless planning for the future be nullified by phenomenal increase in population.

Population of Counties

Table 3 shows the population of each of the 83 counties for 1930 and for the five previous decennial years. In 1930 the population of 19 counties was 3 to 11 times as large as in 1880. The population of Wayne County increased eleven-fold. In 1880 a tenth of the population of the state resided in Wayne County. Now approximately two-fifths (39 per cent) are concentrated in this one county.

Seven counties were not organized until sometime after 1880. Barry, Branch, Cass, Clinton, Hillsdale, Lapeer, Livingston, and Montcalm counties all had fewer residents in 1930 than in 1880. Forty-six counties had smaller populations in 1930 than in 1920. The decrease in population in these 46 counties totaled 29,177 in spite of the fact that births exceeded deaths by 78,897. The loss was due to the net migration of 108,074 people from these counties. Thirty-seven counties actually had fewer inhabitants in 1930 than thirty years before. During the past decade the population more than doubled in Oakland and Macomb counties and increased over 60 per cent in Genesee and Wayne counties.

TABLE 3.—Population of Michigan by Counties from 1880 to 1930
(Source: Federal Census)

Counties	1930	1920	1910	1900	1890	1880
Alcona	4,989	5,912	5,703	5,691	5,409	3,107
Alger	9,327	9,983	7,675	5,868	1,238	.....
Allegan	38,974	37,540	39,819	38,812	38,961	37,815
Alpena	18,574	17,869	19,965	18,254	15,581	8,789
Antrim	9,979	11,543	15,692	16,568	10,413	5,237
Arenac	8,007	9,460	9,640	9,821	5,683	.....
Baraga	9,168	7,662	6,127	4,320	3,036	1,804
Barry	20,928	21,383	22,633	22,514	23,783	25,317
Bay	69,474	69,548	68,238	62,378	56,412	38,081
Benzie	6,587	6,947	10,638	9,685	5,237	3,433
Berrien	81,066	62,653	53,622	49,165	41,285	36,785
Branch	23,950	23,997	25,605	27,811	26,791	27,941
Calhoun	87,043	72,918	56,638	49,315	43,501	38,452
Cass	20,888	20,395	20,624	20,876	20,953	22,009
Charlevoix	11,981	15,788	19,157	13,956	9,686	5,115
Cheboygan	11,502	13,991	17,872	15,516	11,986	6,524
Chippewa	25,047	24,818	24,472	21,338	12,019	5,248
Clare	7,032	8,250	9,240	8,360	7,558	4,187
Clinton	24,174	23,110	23,129	25,136	26,509	28,100
Crawford	3,097	4,049	3,934	2,943	2,962	1,159
Delta	32,280	30,909	30,108	23,881	15,330	6,812
Dickinson	29,941	19,456	20,524	17,890	.....	.....
Eaton	31,728	29,377	30,499	31,668	32,094	31,225
Emmet	15,109	15,639	18,561	15,931	8,756	6,639
Genesee	211,641	125,668	64,555	41,804	39,430	39,220
Gladwin	7,424	8,827	8,413	6,564	4,208	1,127
Gogebic	31,577	33,225	23,333	16,738	13,166	.....
Grand Traverse	20,011	19,518	23,784	20,479	13,355	8,422
Gratiot	30,252	33,914	28,820	29,889	28,668	21,936
Hillsdale	27,417	28,161	29,673	29,865	30,660	32,723
Houghton	52,851	71,930	88,098	66,063	35,389	22,473
Huron	31,132	32,786	34,758	34,162	28,545	20,089
Ingham	116,587	81,554	53,310	39,818	37,666	33,676
Ionia	35,093	33,087	33,550	34,329	32,801	33,872
Iosco	7,517	8,199	9,753	10,246	15,224	6,873
Iron	20,805	22,107	15,164	8,990	4,432	.....
Isabella	21,126	22,610	23,029	22,784	18,784	12,159
Jackson	92,304	72,539	53,426	48,222	45,031	42,031
Kalamazoo	91,368	71,225	60,427	44,310	39,273	34,342
Kalkaska	3,799	5,577	8,097	7,133	5,160	2,937
Kent	240,511	183,041	159,145	129,714	109,922	73,253
Keweenaw	5,076	6,322	7,156	3,217	3,029	4,325
Lake	4,066	4,437	4,939	4,957	6,505	3,233
Lapeer	28,348	25,782	26,033	27,641	29,213	30,138
Leelanau	8,206	9,061	10,608	10,556	7,944	6,253
Lenawee	49,849	47,767	47,907	48,406	48,448	48,343
Livingston	19,274	17,522	17,736	19,664	20,858	22,251
Luce	6,528	6,149	4,004	2,983	2,455	.....
Mackinac	8,783	8,026	9,249	7,703	7,830	2,902
Macomb	77,146	38,103	32,606	33,244	31,813	31,627
Manistee	17,409	20,899	26,688	27,856	24,230	12,532
Manitou *	.....	.....	.....	.....	860	1,334
Marquette	44,076	45,786	46,739	41,239	39,521	25,394
Mason	18,756	19,831	21,832	18,885	16,385	10,065
Mecosta	15,738	17,765	19,466	20,693	19,697	13,973
Menominee	23,652	23,778	25,648	27,046	33,639	11,987
Midland	19,150	17,237	14,005	14,439	10,657	6,893
Missaukee	6,992	9,004	10,606	9,308	5,048	1,553
Monroe	52,485	37,115	32,917	32,754	32,337	33,624
Montcalm	27,471	30,441	32,069	32,754	32,637	33,148
Montmorency	2,814	4,089	3,755	3,234	1,487	.....
Muskegon	84,630	62,362	40,577	37,036	40,013	26,586
Newaygo	17,029	17,378	19,220	17,673	20,476	14,688
Oakland	211,251	90,050	49,570	44,792	41,245	41,537
Oceana	13,805	15,601	18,379	16,644	15,698	11,699

TABLE 3.—Concluded

Counties	1930	1920	1910	1900	1890	1880
Ogemaw	6,595	7,786	8,907	7,765	5,583	1,914
Ontonagon	11,114	12,428	8,650	6,197	3,756	2,565
Osceola	12,806	15,221	17,889	17,859	14,630	10,777
Oscoda	1,728	1,783	2,027	1,468	1,904	467
Otsego	5,554	6,043	6,552	6,175	4,272	1,974
Ottawa	54,858	47,660	45,301	39,667	35,358	33,126
Presque Isle	11,330	12,131	11,249	8,821	4,687	3,113
Roscommon	2,055	2,032	2,274	1,787	2,033	1,459
Saginaw	120,717	100,286	89,290	81,222	82,273	59,095
St. Clair	67,563	58,009	52,341	55,228	52,105	46,197
St. Joseph	30,618	26,818	25,499	23,889	25,356	26,626
Sanilac	27,751	31,237	33,930	35,055	32,589	26,341
Schoolcraft	8,451	9,977	8,681	7,889	5,818	1,575
Shiawassee	39,517	35,924	33,246	33,866	30,952	27,059
Tuscola	32,934	33,320	34,913	35,890	32,508	25,738
Van Buren	32,637	30,715	33,185	33,274	30,541	30,807
Washtenaw	65,530	49,520	44,714	47,761	42,210	41,848
Wayne	1,888,946	1,177,645	531,591	348,793	257,114	166,444
Wexford	16,827	18,207	20,769	16,845	11,278	6,815
Total	4,842,325	3,668,412	2,810,173	2,420,982	2,093,890	1,636,937

*Part annexed to Leelanau and part to Charlevoix County in 1896

Sources of Population Growth

The population of a state may grow by migration from other states, by immigration, and by natural increase—an excess of births over deaths. According to the 1930 Federal Census, of the total number of people living in Michigan:

1,136,886 or 23.5 per cent were natives of other states,
852,758 or 17.6 per cent were foreign born,
2,830,978 or 58.5 per cent were natives of Michigan, and
21,703 or .4 per cent place of birth was not specified.

Michigan's early growth was due largely to migration from New York and the New England states. At present, natives of every state are residing in Michigan but those of nearby states are the most numerous—the eight largest contributors, in order of rank, are Ohio, Illinois, Indiana, Pennsylvania, New York, Wisconsin, Kentucky, and Tennessee. Sixteen per cent of the people residing in Michigan are natives of these eight states. New York, which had always been the largest contributor, has been exceeded by Ohio since 1910. Since the World War, southern states, due primarily to the northward movement of Negroes, have become important in adding to Michigan's growth.

Our present county-township form of local government is largely a heritage from New York State, and our public school system is primarily a heritage from Massachusetts. Variation in denominational allegiance in adjacent communities and in cooperative enterprises, social activities, and occupational endeavors can frequently be more clearly understood from a knowledge of the streams of migration that contributed to their founding.

Some 38 million immigrants have entered the United States during the past hundred years. Michigan has always been one of their favorite Meccas. Foreign born comprise 17.6 per cent of the total population of the state, a percentage considerably higher than for the United States, which is 11.6 per cent. Only New York, Illinois, Pennsylvania, California, and Massachusetts have more foreign born than Michigan and only in New York, Massachusetts, Rhode Island, Connecticut, New Jersey, California, and New Hampshire do the foreign born comprise a larger proportion of the total population. Michigan is one of nine states having more foreign born in 1930 than in 1920, and in no state, except Florida and California, was the per cent of increase so large as in Michigan.

Births, Deaths, and Natural Increase

Excess of births over deaths has been a larger and steadier source of population growth in Michigan than has either immigration or migration from other states. During the decade 1920-30 there occurred 962,834 births[18] and 501,591 deaths[18], resulting in a natural increase of 461,243. This is 39.3 per cent of 1,173,913, the net increase in total population during the decade. Natural increase in the preceding decade was 350,660, comprising 40.9 per cent of the net increase in population. *Table 4* shows the trend in birth, death, and natural increase rates since 1925.

The death rate is expressed as the number of deaths per 1,000 population and the birth rate as the number of births per 1,000 population. The death rate has declined somewhat since 1925, being 11.5 in 1925 and 10.8 in 1935, a drop of 6 per cent. The birth rate has declined more rapidly than the death rate. The birth rate of 23.1 in 1925 had dropped to 18.5 in 1935, a decrease of 20 per cent. In consequence, the excess of births over deaths has gradually diminished, so that the natural increase is only about two-thirds as large in 1935 as it was a decade earlier. A further decline in the birth rate can be expected.

The death rate, after slight further declines, will rise due to the rapidly advancing age of the general population and after four or five decades is likely to be approximately the same as the birth rate.

TABLE 4 —Births, Deaths, and Natural Increase, by Years, Michigan from 1925 to 1935*

Year	Estimated Population	Number			Rate per 1,000 Estimated Population		
		Births	Deaths	Excess Births Over Deaths	Births	Deaths	Natural Increase
1935	4,731,000	87,446	51,050	36,396	18.5	10.8	7.7
1934	4,680,000	83,925	50,442	33,483	17.9	10.8	7.2
1933	5,043,000	80,923	48,536	32,387	16.0	9.6	6.4
1932	4,983,000	85,736	49,585	36,151	17.2	10.0	7.3
1931	4,931,000	90,929	49,104	41,825	18.4	10.0	8.5
1930	4,871,000	99,325	51,620	47,705	20.4	10.6	9.8
1929	4,756,429	99,134	56,118	43,016	20.8	11.8	9.0
1928	4,641,901	97,797	54,794	43,003	21.1	11.8	9.3
1927	4,527,373	100,178	50,643	49,535	22.1	11.2	10.9
1926	4,412,845	98,781	54,084	44,697	22.4	12.3	10.1
1925	4,298,317	99,220	49,419	49,801	23.1	11.5	11.6

*U. S. Census, Vital Statistics, Special Reports, Vol. 2, p. 193

Distribution of Population: Rural and Urban

As previously stated, the total land area of the state is 57,480 square miles. This results in a population density (average number of people per square mile) of 84.2 which is double that for the United States. The population density was only 28.5 in 1880. The total population, shown as urban, rural, and rural-farm, is indicated by counties in *Figure 63*. Wayne, the most populous county, has a population of 1,888,946 or 39 per cent of the total population in the state. The largest rural population is to be found in Oakland County, 77,551, and the largest farm population in Berrien County, 24,210. Twenty-seven counties have no urban population (incorporated places with 2500 or more inhabitants). In 34 other counties the rural population exceeds the urban population. Therefore in 61 counties the population is entirely or predominantly rural. The rural population is about equally divided between the farm and the non-farm, 775,436 and 764,814 respectively. The rural-farm population decreased 8.2 per cent since 1920, while the rural non-farm increased 31.3 per cent, and the urban population increased 47.3 per cent. The farm population, although comprising a relatively small proportion of the total population of the state (16 per cent), comprises more than one-half of the total population in 29 counties.

One of the most significant changes in the distribution of the population has been the increasing number and proportion of the total population living in urban centers, a reflection of Michigan's rapid industrial and commercial development. Michigan's distribution of population on the rural-urban basis at each of the last six censuses is shown in *Table 5*.

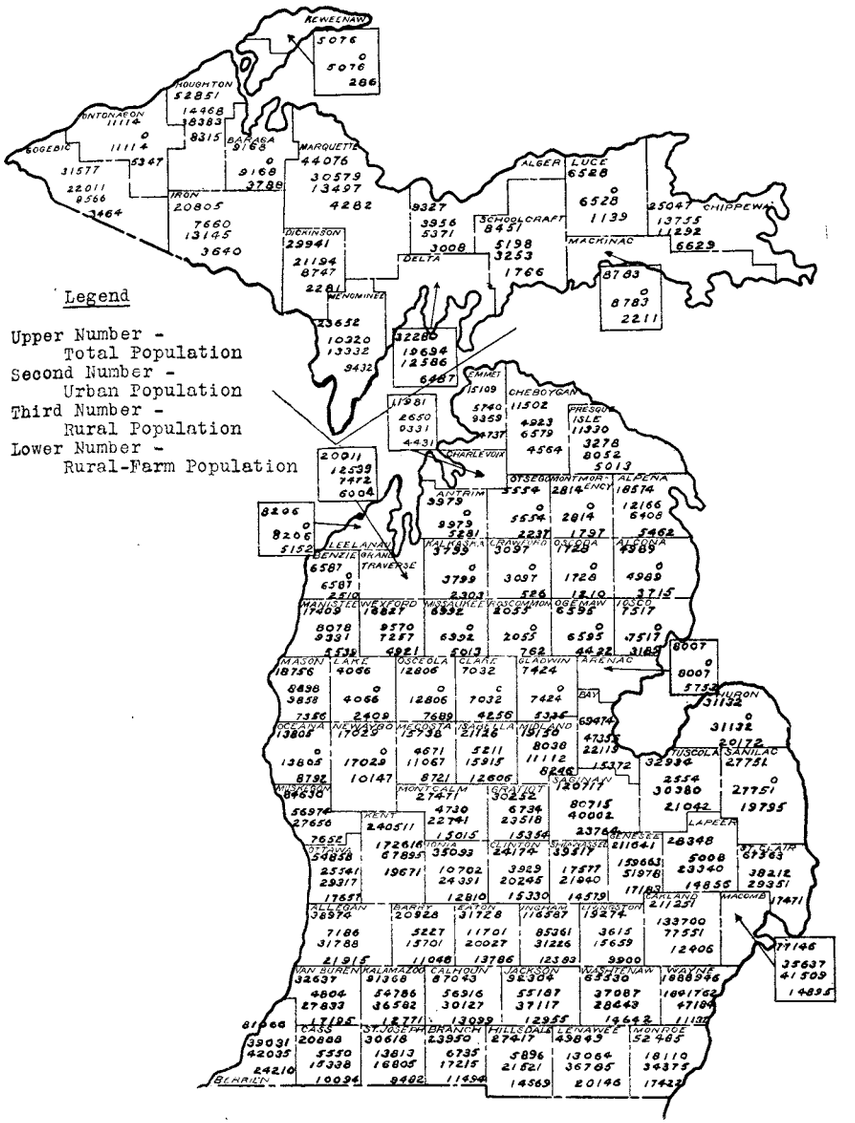


FIGURE 63. TOTAL POPULATION, URBAN, RURAL, AND RURAL-FARM POPULATION, BY COUNTIES

TABLE 5.—Urban and Rural Population, Michigan from 1880 to 1930*

Year	Number		Per Cent	
	Urban	Rural	Urban	Rural
1880	405,412	1,231,525	24.8	75.2
1890	730,294	1,363,596	34.9	65.1
1900	952,323	1,468,659	39.3	60.7
1910	1,327,044	1,483,129	47.2	52.8
1920	2,241,560	1,426,852	61.1	38.9
1930	3,302,075	1,540,250	68.2	31.8

*Fifteenth Census of the United States: 1930, Vol. II, p. 14

Soon after 1910 the urban population outstripped in numbers the rural population and has been gaining rapidly ever since. Over two-thirds (68.2 per cent) of Michigan's population now live in cities. In 1880 17 states were more urban than Michigan, in 1930 only 7 states. This rapid cityward movement of population affects the birth, death, marriage, and divorce rates, the death rates for specific diseases, age composition, sex ratios, age at marriage, size of family, and other aspects of population. These changes in turn affect social, economic, educational, and political problems.

Population Density

There is a considerable variation between counties in area, in population, and in population density. The smallest county, Benzie, with 314 square miles, is only one-sixth the size of Marquette County. Wayne County with its 1,888,946 residents, though only slightly larger in area than Oscoda, has 1,093 times the population and 1,016 times as great a population density. *Table 6,* which gives the area and population density of each county, shows that 13 counties have 100 or more people per square mile. All of them, except Macomb, have one or more large urban centers, and all are becoming increasingly more densely populated each decade. In 12 counties the population density is under 10, in none of which, except Schoolcraft, is there an incorporated place of 2,500 or more inhabitants, and all except Luce are less densely populated than formerly. Limited amounts of good farm land generally restrict total population as well as farm population density. Population is very unevenly distributed and is constantly increasing. Of the 39 counties with less than 30 people per square mile, 34 declined in population during the past decade, while of the 13 counties with population density over 100 only one declined and this decline was only 0.1 per cent. Continued population decreases will require realignments of school districts, churches, organizations, businesses, and possibly community centers on an enlarged territorial basis.

TABLE 6.—Area and Population Density of Counties—1930

County	Land Area Square Miles	Population Per Square Mile		
		Total	Rural	Farm*
Alcona	684	7.3	7.3	5.4
Alger	920	10.1	5.8	3.3
Allegan	833	46.8	38.2	26.5
Alpena	584	31.8	11.0	9.4
Antrim	475	21.0	21.0	11.1
Arenac	374	21.4	21.4	15.4
Baraga	917	10.0	10.0	4.1
Barry	556	37.6	28.2	20.1
Bay	443	156.8	49.9	34.8
Benzie	314	21.0	21.0	8.0
Berrien	569	142.5	73.9	42.9
Branch	497	48.2	34.6	23.3
Calhoun	693	125.6	43.5	19.2
Cass	493	42.4	31.1	20.5
Charlevoix	411	29.2	22.7	11.0
Cheboygan	725	15.9	9.1	6.4
Chippewa	1,573	15.9	7.2	4.3
Clare	582	12.1	12.1	7.3
Clinton	571	42.3	35.5	27.0
Crawford	575	5.4	5.4	.9
Delta	1,169	27.6	10.8	5.7
Dickinson	776	38.6	11.3	3.2
Eaton	571	55.6	35.1	24.7
Emmet	485	31.2	19.3	9.8
Genesee	655	323.1	79.4	27.8
Gladwin	519	14.3	14.3	10.3
Gogebic	1,133	27.9	8.4	3.5
Grand Traverse	467	42.9	16.0	12.9
Gratiot	579	52.2	40.6	26.8
Hillsdale	597	45.9	36.0	24.5
Houghton	1,019	51.9	37.7	8.2
Huron	854	36.5	36.5	23.6
Ingham	553	210.8	56.5	22.9
Ionia	579	60.6	42.1	22.3
Iosco	570	13.2	13.2	5.6
Iron	1,200	17.3	11.0	3.1
Isabella	572	36.9	27.8	22.3
Jackson	707	130.6	52.5	18.4
Kalamazoo	562	162.6	65.1	22.9
Kalkaska	573	6.6	6.6	4.0
Kent	860	279.7	78.9	23.7
Keweenaw	554	9.2	9.2	.5
Lake	579	7.0	7.0	4.2
Lapeer	666	42.6	35.0	22.7
Leelanau	338	24.3	24.3	15.2
Lenawee	743	67.1	49.5	27.3
Livingston	568	33.9	27.6	17.5
Luce	920	7.1	7.1	1.2
Mackinac	1,044	8.4	8.4	2.1
Macomb	472	163.4	87.9	32.0
Manistee	562	31.0	16.6	9.9
Marquette	1,870	23.6	7.2	2.4
Mason	494	38.0	20.0	14.9
Mecosta	571	27.6	19.4	15.5
Menominee	1,056	22.4	12.6	9.0
Midland	529	36.2	21.0	16.0
Missaukee	582	12.0	12.0	8.6
Monroe	573	91.6	60.0	30.4
Montcalm	724	37.9	31.4	20.8
Montmorency	561	5.0	5.0	3.2

TABLE 6.—Concluded

County	Land Area Square Miles	Population Per Square Mile		
		Total	Rural	Farm*
Muskegon	504	167.9	54.9	15.3
Newaygo	851	20.0	20.0	11.9
Oakland	886	238.4	87.5	14.1
Oceana	543	25.4	25.4	16.2
Ogemaw	580	11.4	11.4	7.6
Ontonagon	1,333	8.3	8.3	4.0
Osceola	577	22.2	22.2	13.3
Oscoda	576	3.0	3.0	2.1
Otsego	528	10.5	10.5	4.2
Ottawa	565	97.1	51.9	31.5
Presque Isle	678	16.7	11.9	7.4
Roscommon	538	3.8	3.8	1.4
Saginaw	828	145.8	48.3	28.9
St. Clair	710	95.2	41.3	24.8
St. Joseph	503	60.9	33.4	19.0
Sanilac	976	28.4	28.4	20.3
Schoolcraft	1,207	7.0	2.7	1.5
Shiawassee	557	70.9	39.4	26.3
Tuscola	827	39.8	36.7	25.4
Van Buren	617	52.9	45.1	27.9
Washtenaw	704	93.1	40.4	20.8
Wayne	620	3,046.7	76.1	24.7
Wexford	577	29.2	12.6	8.8
MICHIGAN	57,480	84.2	26.8	13.7

*In order that farm population density of counties be comparable, the land area comprised by the three cities with 100,000 or more inhabitants was deducted from the county areas in which these cities are located. Thus Detroit has an area of 139 square miles, Flint has 28 square miles, and Grand Rapids has 23 square miles. These areas were deducted from Wayne, Genesee, and Kent counties, respectively.

The average rural population density is 26.8 and varies from 2.7 in Schoolcraft County to 87.9 in Macomb. There were fewer rural people per square mile in 1930 than in 1920 in 51 counties. These declines occurred principally in the counties in which the rural population density is already low and first class agricultural land is limited.[30]

The average farm population density is 13.7 and varies from .5 in Keweenaw County to 42.9 in Berrien. In general, farm population density decreases as one travels from the southern toward the northern counties. None of the counties in upper Michigan have an average of more than 9 persons per square mile while all but 6 counties in the five southern tiers of counties have an average of 20 or more. Farm population is often very unequally distributed over a county. In a few counties about one-half of the total farm population resides in one township, as in Rock River township of Alger County and Ironwood township of Gogebic County. In Keweenaw County virtually all of its farm population reside in Allouez township. Adequate schools, church services, general merchandising

facilities, and other necessities cannot be maintained where farm families are few and scattered.

Village Growth and Decline

Scattered over the state are 475 incorporated cities and villages ranging in size from 27 inhabitants (Lake Angelus, Oakland County) to 1,568,662 inhabitants (Detroit), and also about a thousand unincorporated hamlets of some 50 or more inhabitants. Most of the unincorporated hamlets are small, too small to be considered community centers, or multiple service centers which offer library and medical facilities, 12-grade education, weekly newspapers, banking privileges, and other services that people need from day to day. Several score of the incorporated cities and villages are also too small to serve as centers of tributary areas from which a majority of the families come to the village for a majority of their services.

A classification of the incorporated cities and villages by size is given in *Table 7*.

TABLE 7.—Number of Incorporated Places of Specified Size, Michigan—1930

Size	Number	Size	Number
Under 100	6	700 to 800	16
100 to 200	14	800 to 900	25
200 to 300	38	900 to 1,000	12
300 to 400	48	1,000 to 1,500	65
400 to 500	37	1,500 to 2,000	29
500 to 600	24	2,000 to 2,500	17
600 to 700	30	2,500 and over	114
Total			475

Of these 475 incorporated centers of population, 361 or three-fourths are rural centers (under 2,500 inhabitants), over one-half can be said to be "small" community centers since they have fewer than 1,000 inhabitants, and nearly a third are "very small" villages since they have fewer than 500 inhabitants. Of the villages with 500 to 1,000 inhabitants approximately one-half have no furniture, shoe, millinery, jewelry, or dry goods stores, dentists, or motion picture houses; and over two-thirds have no plumbers, men's clothing stores, variety stores, lawyers, tailors, florists, or electricians. These services are still more rare in smaller villages.

The struggle for survival is felt keenly by a third of all incorporated places and by a larger proportion of the "small" and "very small" villages, especially those beyond the suburban zones of in-

fluence of the larger metropolitan centers. *Table 8* shows the number and percentage of incorporated cities and villages of different sizes which lost in population during the decade 1920-30.

TABLE 8.—Number and Percentage of Incorporated Cities and Villages which Decreased in Population from 1920 to 1930

Size of Place in 1920	Number of Places	Number which Decreased	Percentage which Decreased
Under 500	143	55	39
500 to 1,000	106	38	36
1,000 to 2,500	102	28	27
2,500 and over	92	24	26
Total	443	145	33

Over a fourth of the 92 urban centers had fewer inhabitants in 1930 than a decade earlier, and virtually two-fifths (39 per cent) of the 143 "very small" villages experienced similar declines. Each decade a smaller proportion of cities and villages, regardless of size, is increasing and a larger proportion is decreasing. The farther removed such places are from regions of suburban influence the greater the percentage of decline.

Figure 64 shows the location of the 475 incorporated cities and villages in Michigan, classified by size, and whether they increased or decreased in population during the past decade. It also shows that in Antrim County all four of the incorporated population centers, Central Lake, Bellaire, Mancelona, and Elk Rapids, lost in population. In Osceola County, all six centers, Reed City, Hersey, Evart, LeRoy, Marion, and Tustin decreased; likewise in Gratiot County, all seven places, Alma, St. Louis, Breckenridge, Ithaca, Ashley, Perrinton, and Carson City. North of the four southern tiers of counties were 203 incorporated population centers in 1920, 95 of which, or 47 per cent, had fewer inhabitants in 1930 than they had a decade earlier.

In Macomb, Oakland, Monroe, and most of the other counties in southern Michigan, all or practically all cities and villages increased in population. The development of good roads and the rapid increase in the use of automobiles in commuting zones of the larger cities have been a boom to population centers in such suburban regions. Thousands of workers in Detroit sought residence in the small hamlets around Detroit promoting the growth of such places so that 23 hamlets in Wayne, Macomb, and Oakland counties incorporated as cities or as villages between 1920 and 1930. While the population in and around Detroit, Flint, Pontiac, Grand Rapids,

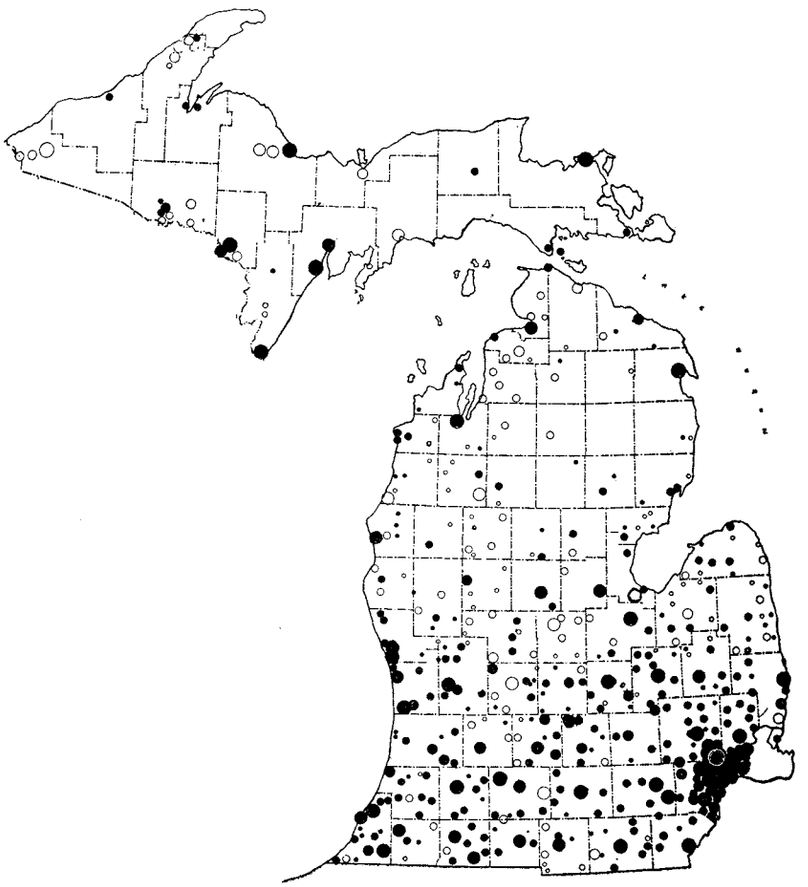


FIGURE 64. LOCATION, SIZE, AND CHANGE IN POPULATION IN CITIES AND VILLAGES, 1920-1930

Population	From 1920 - 1930 Decrease	Increase
Under 500	○	●
500 — 2499	○	●
2500 — 4999	○	●
5000 — 9999	○	●
10000 and over	○	●

Open circle shows decrease since 1920
Solid circle shows increase since 1920
Source: U. S. Census, 1930

and other large cities has increased rapidly in recent decades the population in the majority of counties, townships, school districts, and communities has decreased.

Counties with Smaller Population in 1930 than Formerly

So much attention has been centered on population growth in general, and on urban centers in particular that we have been quite oblivious of the vast areas of population declines. Over two-thirds, 57 counties, had fewer people in 1930 than at some former state* or federal census. These 57 counties with the extent of their declines are presented in *Table 9*. Seven of these counties attained their maximum population in 1880, three in 1884, three in 1890, two in 1894, three in 1900, ten in 1904, seventeen in 1910, and twelve in 1920.

Houghton County has experienced the largest absolute loss, 35,247 since 1910 or a decline of 40 per cent. Nearly one-half of this decline occurred in the vicinity of Calumet due principally to reduction of mining operations. Manistee's population of 27,856 in 1900 had shrunk to 17,409 in 1930, a decline of 37.5 per cent. In proportion to population, the greatest losses were experienced in Kalkaska, Iosco, Lake, Houghton, Antrim, and Benzie counties. Kalkaska County has less than one-half the population it had in 1910 and Iosco has slightly less than one-half of the population it had in 1890. Continued population declines seem almost inevitable in these and a majority of other counties in the northern part of the state, due primarily to their limited amounts of good agricultural land,[37] inaccessibility to markets, and costliness of the community institutions and services necessary for the maintenance of a socially desirable standard of living. Such population declines react unfavorably on property values which are the basis of taxation and governmental support.

Most counties that now have a total population density under 27 persons per square mile, a rural population density under 17 persons per square mile, or a farm population density under 10 persons per square mile, or about one-third of the counties, are very likely to continue declining in population. Already most of them have fewer people than one might expect solely on the basis of proportion of first class agricultural land. They seem to have been over-settled from the standpoint of a permanent and satisfying agriculture and the maintenance of a reasonably moderate standard of living.

The first three years of the depression, 1930-1932, reversed the major migrations of people within the state. Farm people tem-

*The State of Michigan has taken a census of population every ten years from 1845 to 1904.

TABLE 9.—Counties of Michigan with less population in 1930 than formerly, maximum population and date, present population, and extent of decline from maximum to 1930

County	Maximum Population		1930 Population	Population Change	
	Date	Number		Number	Per Cent
Alcona	1920	5,912	4,989	— 923	—15.6
Alger	1920	9,983	9,327	— 656	— 6.6
Allegan	1910	39,819	38,974	— 845	— 2.1
Alpena	1910	19,965	18,574	— 1,391	— 7.0
Antrim	1900	16,568	9,979	— 6,589	—39.8
Arenac	1904	10,184	8,007	— 2,177	—21.4
Barry	1880	25,317	20,928	— 4,389	—17.3
Bay	1920	69,548	69,474	— 74	— .1
Benzie	1904	10,638	6,587	— 4,051	—38.1
Branch	1880	27,941	23,950	— 3,991	—14.3
Cass	1880	22,009	20,888	— 1,121	— 5.1
Charlevoix	1910	19,157	11,981	— 7,176	—37.5
Cheboygan	1910	17,872	11,502	— 6,370	—35.6
Clare	1910	9,240	7,032	— 2,208	—23.9
Clinton	1880	28,100	24,174	— 3,926	—14.0
Crawford	1920	4,049	3,097	— 952	—23.5
Eaton	1894	32,618	31,728	— 890	— 2.7
Emmet	1910	18,561	15,109	— 3,452	—18.6
Gladwin	1920	8,827	7,424	— 1,403	—15.9
Gogebic	1920	33,225	31,577	— 1,648	— 5.0
Grand Traverse	1910	23,784	20,011	— 3,773	—15.9
Gratiot	1920	33,914	30,252	— 3,662	—10.8
Hillsdale	1880	32,723	27,417	— 5,306	—16.2
Houghton	1910	88,098	52,851	— 35,247	—40.0
Huron	1904	34,945	31,132	— 3,813	—10.9
Iosco	1890	15,224	7,517	— 7,707	—50.6
Iron	1920	22,107	20,805	— 1,302	— 5.9
Isabella	1904	24,106	21,126	— 2,980	—12.4
Kalkaska	1910	8,097	3,799	— 4,298	—53.1
Keweenaw	1910	7,156	5,076	— 2,080	—29.1
Lake	1884	7,539	4,066	— 3,473	—46.1
Lapeer	1880	30,138	28,348	— 1,790	— 5.9
Leelanau	1904	10,826	8,206	— 2,620	—24.2
Livingston	1880	22,251	19,274	— 2,977	—13.4
Mackinac	1910	9,249	8,783	— 466	— 5.0
Manistee	1900	27,856	17,409	— 10,447	—37.5
Marquette	1910	46,739	44,076	— 2,663	— 5.7
Mason	1910	21,832	18,756	— 3,076	—14.1
Mecosta	1894	20,729	15,738	— 4,991	—24.1
Menominee	1890	33,639	23,652	— 9,987	—29.7
Missaukee	1910	10,606	6,992	— 3,614	—34.1
Montcalm	1884	35,356	27,471	— 7,885	—22.3
Montmorency	1920	4,089	2,814	— 1,275	—31.2
Newaygo	1890	20,476	17,029	— 3,447	—16.8
Oceana	1910	18,379	13,805	— 4,574	—24.9
Ogemaw	1904	9,121	6,595	— 2,526	—27.7
Ontonagon	1920	12,428	11,114	— 1,314	—10.6
Osceola	1904	18,633	12,806	— 5,827	—31.3
Oscoda	1910	2,027	1,728	— 299	—14.8
Otsego	1904	7,239	5,554	— 1,685	—23.3
Presque Isle	1920	12,131	11,330	— 801	— 6.6
Roscommon	1884	2,588	2,055	— 533	—20.6
Sanilac	1900	35,055	27,751	— 7,304	—20.8
Schoolcraft	1920	9,977	8,451	— 1,526	—15.3
Tuscola	1904	35,961	32,934	— 3,027	— 8.4
Van Buren	1904	34,965	32,637	— 2,328	— 6.7
Wexford	1910	20,769	16,827	— 3,942	—19.0
Total	.....	1,240,285	1,021,488	—218,797	—17.6

porarily ceased their migration to the city and many thousands of unemployed industrial laborers and their families sought partial refuge from the economic depression in abandoned farm homes and vacant village dwellings. While only 37 counties, all predominantly urban, experienced gains in population during the decade 1920-30, 64 counties, most of them predominantly rural, apparently increased from April 1, 1930 to June 1, 1934, 13 of them having gained more than 15 per cent.[30] Most of these migrants are apparently temporary refugees rather than permanent settlers. This is indicated in the decline in population from May, 1933 to June, 1934, in about 60 counties, most of them entirely or predominantly rural. Approximately the same number of counties declined in population during each of the next two years.

Trend in Population of Townships 1920 to 1930

Townships vary considerably in population though about three-fourths are uniform in area, 36 square miles. Nineteen townships, exclusive of incorporated villages, have over 5,000 inhabitants while 39 townships scattered over 19 counties have under 100 inhabitants.

Figure 65 shows the location of townships which increased in population during the past decade and those that decreased. Of the 1,271 townships two-fifths increased in population and three-fifths decreased. The former are found predominantly in the southern half of the state in the commuting zones of the industrial centers. In the counties of Arenac, Clare, Crawford, Gladwin, Kalkaska, Mecosta, Montmorency, Osceola, and Sanilac every township decreased during the past decade. In a majority of these and other townships the decline had started a decade earlier, and in numerous instances, two, three, and sometimes four decades earlier. Foster Township, Ogemaw County, serves as an example of the extent of population decrease in a lumbering region over a period of 40 years. The area now embodied in Foster Township, 90 square miles, had a population in 1890, at about the height of the lumbering industry in this region, of over 1,000. The number had dwindled to 20 by 1930.

There are considerably over a hundred villages with fewer inhabitants than formerly and also fewer residents in the tributary or trading area of these community centers. Fewer people generally means fewer doctors, dentists, banks, hospitals, libraries, and other services. It also involves traveling more miles for such services. There is, in general, a relationship between each specific service and the minimum number of people necessary for its economic sur-

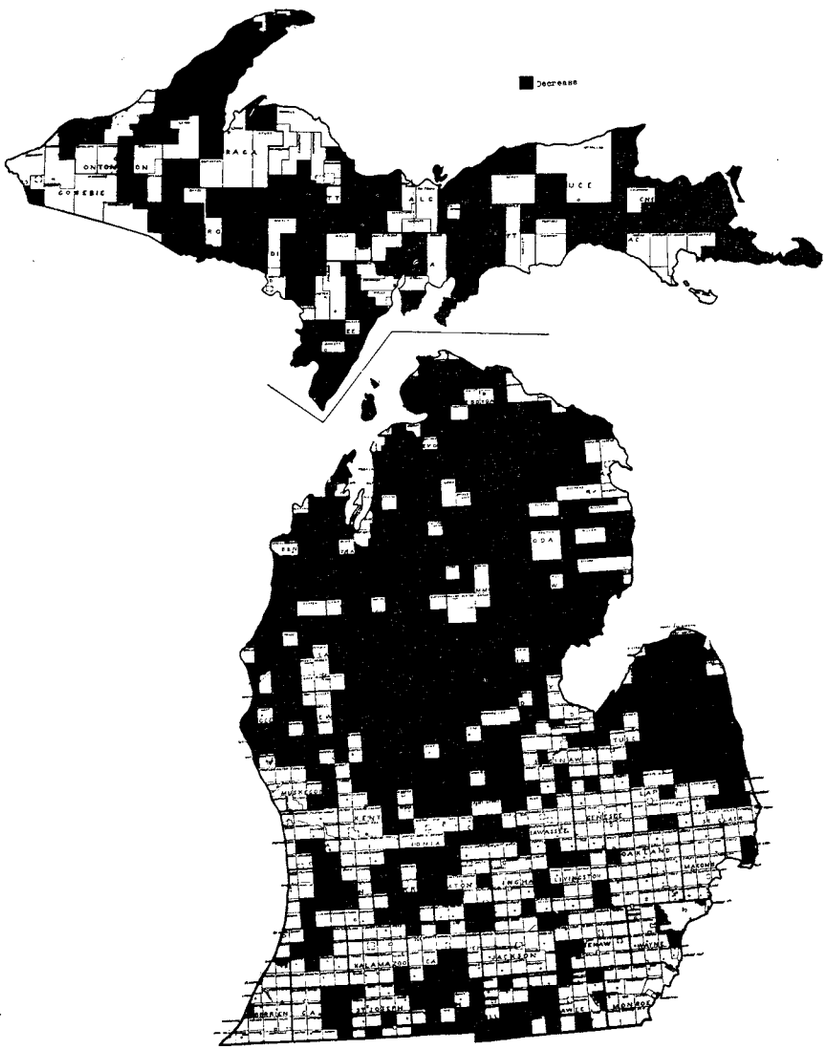


FIGURE 65. TOWNSHIPS WHICH DECREASED IN POPULATION, 1920-1930

vival and success. A declining population makes the struggle for existence more acute for the primary school districts, the churches, granges, lodges, ladies' aids, and all other organizations and institutions. Competition between existing agencies performing similar functions may become more keen with mergers and federations the final resort.

Age Composition

Michigan, relatively speaking, has neither many young nor many old people. About one-half of the states, especially the southern states, have more young people under 25 years of age than has Michigan, and about one-half of the states, particularly the New England states, have more old people 65 years of age and older. Michigan's demand for factory workers has brought thousands of young people from other states and slackened the generally rapid increasing average age of the population. The cities of the state have a much larger proportion of people in the predominant economically productive years (20 to 45) than have the farms, 44.3 per cent as compared with 28.7 per cent. The migration of farm youth, especially girls, to cities is high. The numerical predominance of boys over girls on the farms of Michigan is revealed in the following figures:

Age

15-19 47,008 boys and 35,034 girls, a ratio of 134 boys to 100 girls
20-24 29,927 boys and 19,616 girls, a ratio of 153 boys to 100 girls
25-29 20,228 boys and 16,645 girls, a ratio of 122 boys to 100 girls

Economic opportunities on farms are more limited for girls than for boys and consequently the girls tend to migrate to the cities in relatively large numbers.

The percentage of people of a more or less economically self-supporting age (20 to 64) is generally very much higher in the urban centers than in the rural areas, while the proportion of people in the more or less economically non-selfsupporting ages (under 20, and 65 and over) is generally higher in the rural areas. The variation between counties in the percentage under 20 years of age and 65 and over is presented in *Figure 66*.

In Schoolcraft, Menominee, and Mecosta counties one-half of the population is of the more or less productive age (20 to 64) and one-half is of a relatively unproductive age. In 27 counties over one-half of the population is under 20 years and 65 and over, and none of these counties are in the four southern tiers of counties. Considering those from 20 to 64 as being of the "productive age" and

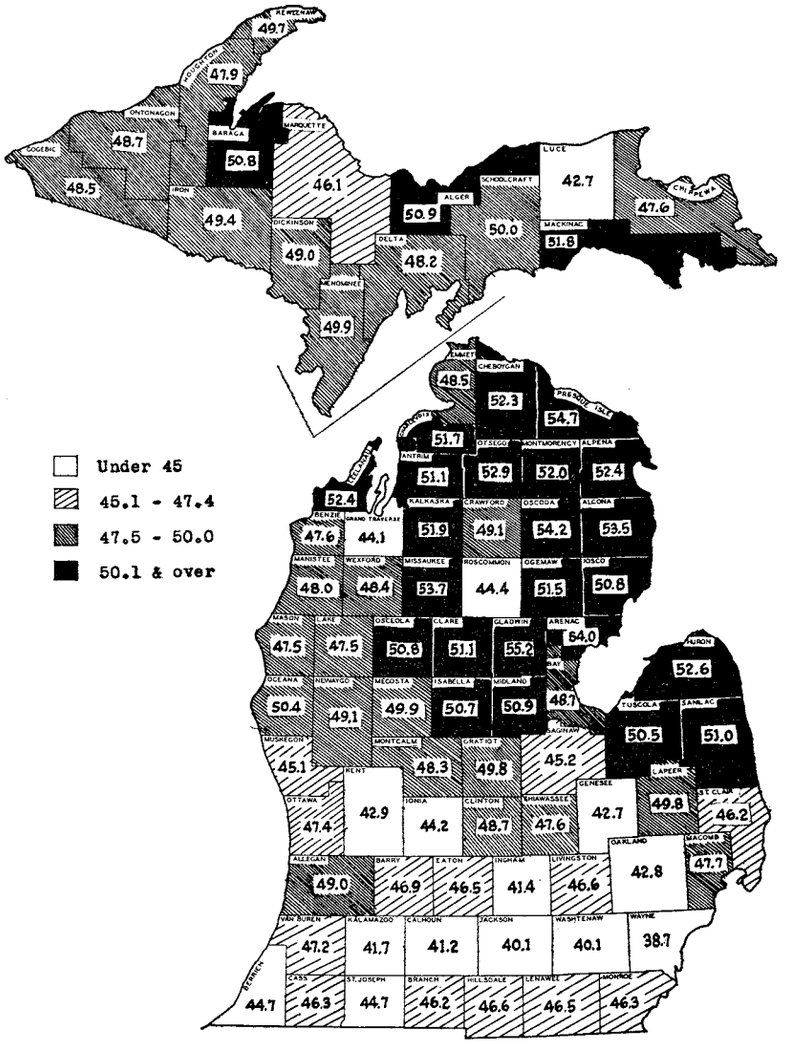


FIGURE 66. PER CENT THAT COMBINED POPULATION OF AGE GROUP UNDER 20 YEARS AND AGE GROUP 65 AND OVER IS OF TOTAL POPULATION. 1930

those under 20 years and 65 and over as being of the "unproductive age", it would seem that Wayne, Washtenaw, Jackson, Calhoun, Ingham, and several dozen other counties mostly in the southern part of the state, where there are relatively many people of the "productive age", have economic advantages in tax-paying power and otherwise over such counties as Gladwin, Presque Isle, Oscoda, Arenac, Missaukee, and Alcona. In Gladwin County 55.2 per cent of the population falls in the "unproductive age" group as compared with 38.7 per cent in Wayne. This means that in Wayne County 1,000 persons of the "productive age" have on an average only about 631 persons of the "unproductive age" to support and in Gladwin County 1,000 persons of the "productive age" have to support about 1232 persons who fall in the "unproductive age".

Some counties have over four times as many old folks, 65 years of age and over, as Wayne, the county with the smallest proportion of aged people. Of the total population in Branch County and also in Hillsdale County, 11.7 per cent are 65 years of age or over, in contrast to Wayne County with 2.7 per cent. Other counties with relatively few old folks, 65 years and older, are Genesee (3.6 per cent), Iron (3.6 per cent), Gogebic (3.8 per cent), Keweenaw (3.9 per cent), Alger (3.9 per cent), and Oakland (4.0 per cent). Other counties having relatively many old folks are Barry (11.3 per cent), Van Buren (11.2 per cent), and Montcalm (11.0 per cent).

Among the more significant changes in the population of Michigan are the declining proportion in the younger age group and the increasing proportion in the older age groups. This is apparent from

TABLE 10.—Age Composition, by 5-Year Age Periods, Michigan from 1880 to 1930

Age Group	1880	1890	1900	1910	1920	1930
Under 5	12.7	11.4	10.8	10.6	11.0	9.6
5— 9	11.7	11.4	10.9	9.8	10.0	10.1
10—14	10.9	10.5	10.2	9.2	8.9	9.4
15—19	10.0	9.8	9.6	9.5	8.1	8.6
20—24	10.4	9.7	9.2	9.4	8.6	8.6
25—29	8.5	8.5	8.2	8.6	9.4	8.6
30—34	7.3	7.8	7.4	7.5	8.5	8.1
35—39	6.5	6.5	6.8	6.8	7.6	8.2
40—44	5.2	5.5	6.1	6.0	6.1	6.9
45—49	4.4	4.8	5.1	5.4	5.4	5.7
50—54	3.8	4.0	4.3	4.8	4.5	4.6
55—59	2.8	3.1	3.5	3.7	3.6	3.6
60—64	2.3	2.5	2.8	3.0	3.0	2.8
65—69	1.5	1.9	2.1	2.4	2.2	2.2
70—74	1.0	1.3	1.4	1.6	1.5	1.5
75—79	.6	.7	.9	1.0	.9	.9
80 and over	.4	.6	.7	.7	.7	.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 10. The percentages of people under 5, 5-9, 10-14, 15-19, and 20-24 have declined fairly steadily, while those in the older age groups have increased. The percentage in the age group under 5, 12.7 in 1880, dropped to 9.6 in 1930, a decline of 24 per cent. Those 65 years of age and over comprised 3.5 per cent of the total population in 1880, and 5.2 per cent in 1930, an increase of 48 per cent. The very large migration from other states and foreign countries during the past two decades, most of them between the ages of 20 and 45, the child-bearing period and an age group with a relatively low death rate, tended to slow down the declining proportion in the younger age groups, and likewise tended to slow down the increasing proportion in the older age groups.

The decline in the proportion of children and young folks, and the increase in the proportion of old folks and the middle-aged, by decades, is shown graphically in *Figure 67*. Young folks will undoubtedly be a continually decreasing proportion of the total population while old people will be a constantly increasing proportion for at least a half century when an approximately stationary age distribution will probably have been reached. Three basic factors

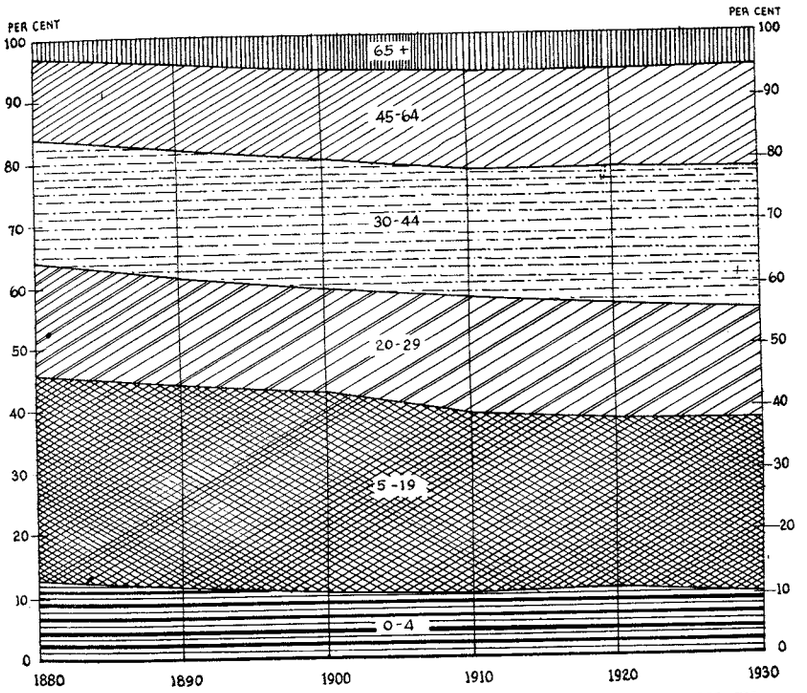


FIGURE 67. PERCENTAGE DISTRIBUTION OF THE POPULATION IN MICHIGAN, BY SELECTED AGE PERIODS, 1880-1930
(Based on Table 10)

are primarily responsible for this changing age composition—declining birth rate, declining death rate, and immigration restriction. Declining birth rate has been by far the most influential factor in recent decades. Diminishing births cause additions to the younger age groups to become relatively smaller, thereby lowering the proportion of children to the total population and consequently increasing the proportion in the older age groups. Lowering the death rates among infants and children where, in the past, most of the decline in the death rate has occurred affects the present age composition. Decade after decade, an increasing proportion of those born are being kept alive until maturity. In former times many of these children would have succumbed to measles, scarlet fever, smallpox, typhoid fever, diphtheria, croup, whooping cough, and other communicable diseases. The economic and social consequences of the increasing proportion of the aged are numerous. For instance, the necessity for adult education, old age pensions, unemployment insurance, shorter work days, and many other factors promoting economic and social security will receive added emphasis.

Sex Ratio

Males have always outnumbered females to a greater extent in Michigan than in the United States generally. Michigan has 108.4 males per 100 females as compared with 102.5 for the United States. This reflects a large proportion of foreign born; as well as mining, automobile, manufacturing, and lumbering activities. Numerical predominance of males in Michigan stands in striking contrast to four of the New England states and six other states and the District of Columbia where females outnumber the males.

In Michigan, males are much more numerous than females among all races and nationality groups than in the United States as a whole. Only in Washtenaw, Kent, and Lenawee counties do the females exceed, in numbers, the males. The numerical predominance of males is generally greater in the rural counties due usually to the relatively greater migration of females to the cities. In all but 16 counties the sexes were more nearly equal in 1930 than in 1880, a healthy trend, since in general the development of occupational activities in any region which encourages the much more rapid increase of one sex than of the other often breeds social as well as industrial problems.

Racial Composition and Trend

Ninety-six per cent of the population of Michigan is white, or of the Caucasian race, 3.5 per cent is black, or of the Negroid race, and only .5 per cent is yellow, or of the Mongoloid race, which includes the American Indian. The racial composition of Michigan's population at present and at three former censuses is indicated in *Table 11.*

TABLE 11.—Population of Michigan by Color or Race from 1900 to 1930
(Source: U. S. Census)

	Number				Per Cent			
	1930	1920	1910	1900	1930	1920	1910	1900
White	4,650,171	3,600,283	2,785,135	2,398,563	96.0	98.2	99.1	99.1
Negro	169,453	60,082	17,115	15,816	3.5	1.6	0.6	0.7
Other races	22,701	6,703	7,811	6,603	0.5	0.2	0.3	0.3
Mexican	13,336	1,344	112	.....	0.3	.....	.....	.....
Indian	7,080	5,614	7,519	6,354	0.1	0.2	0.3	0.3
Chinese	1,081	792	241	240	.....	.....	.....	.....
Japanese	176	184	49	9	.....	.....	.....	.....
Filipino	787	88	2	.....	.....	.....	.....	.....
Hindu	181	38	.....	.....	.....	.....	.....	.....
Korean	53	30	.....	.....	.....	.....	.....	.....
Hawaiian	7	7	.....	.....	.....	.....	.....	.....
Total	4,842,325	3,668,412	2,810,173	2,420,982	100.0	100.0	100.0	100.0

Negroes increased 257 per cent in Michigan during the decade 1910-20, a larger increase than in any other state excepting Arizona, which, however, had only 2,009 Negroes in 1910. During the decade 1920-30 the Negroes increased 182 per cent, a very much larger increase than in any other state. The restriction of immigration during the twenties and the great demand for labor in our expanding automobile factories accelerated the movement of Negroes northward. In most of the southern states a majority of the Negroes live on farms, while in most of the northern states the majority,—in Michigan as much as 94.2 per cent,—live in urban centers. The cityward trend of Negroes is growing. In 1910, 71 per cent of the 17,115 Negroes in the state were residing in urban centers; in 1920, 91.6 per cent; and by 1930, 94.2 per cent. Of the 169,453 Negroes in the state, 120,060 or 70 per cent live in Detroit. Negroes comprise 12.8 per cent of the population of Ypsilanti, 12.4 per cent of River Rouge, 11.4 per cent of Albion, and 11.1 per cent of Ecorse. Negroes reside in all but 7 counties of the state and comprise as much as ten per cent of the population of Lake County.

Other colored races have never comprised as much as one per cent of the total population. Of these the Indians have always been the most numerous until recent years. In 1930 we had about twice as many Mexicans as Indians. The Mexicans are distributed over 43 counties and the Indians over 74. Though there are nearly twice as many Japanese as Chinese in the United States, Michigan, like 37 other states, has more Chinese than Japanese.

Nativity and Nationality of Foreign Born

Michigan is one of nine states having more foreign born in 1930 than in 1920 though in no state, except Florida and California, was the per cent of increase as large as in this state. Only in New York, Illinois, Pennsylvania, California, Massachusetts, Rhode Island, Connecticut, New Jersey, and New Hampshire do the foreign born comprise a larger proportion of the total population.

Native white of native parents comprise slightly less than one-half of the total population, and approximately one-half are either foreign born or native born of parents one or both of whom were foreign born. The nativity of Michigan's population is as follows:

		Per Cent
Native white of native parentage	2,364,038	48.8
Native white of foreign parentage	917,856	18.9
Native white of mixed parentage	528,009	10.0
Foreign born white	840,268	17.4
Non-white*	192,154	4.0

*Negro, Mexican, Indian, Chinese, Japanese, Filipino, Hindu, Korean, Hawaiian

Data by counties for 1930 is available for native white and for foreign born white rather than for total native born and total foreign born. Of the 852,758 foreign born 98.5 per cent are white. Counties vary greatly in the nativity of their population. The percentage that each of the different nativity groups is of the total population is presented in *Figure 68*.

In general the proportion of foreign born increases as one goes from the southern counties to the northern part of the state. In proportion to population Wayne County has a very high percentage of foreign born, 25.9. Only two counties have higher percentages, namely, Keweenaw, 26.6, and Gogebic, 28.3. Iron has the same percentage as Wayne. In four counties, all in upper Michigan, the foreign born outnumber the native born of native parentage, namely Gogebic, Houghton, Iron, and Keweenaw. In two others, Ontonagon and Marquette counties, there are almost as many foreign born as native born of native parentage.

There are at least 180 "Little Finlands," "Little Polands," "Little Denmarks" and other nationality settlements in the rural areas, particularly in northern Michigan, characterized by languages, organizations, institutions, economic activities, customs, habits, and traditions peculiar to their native country. This hetero-

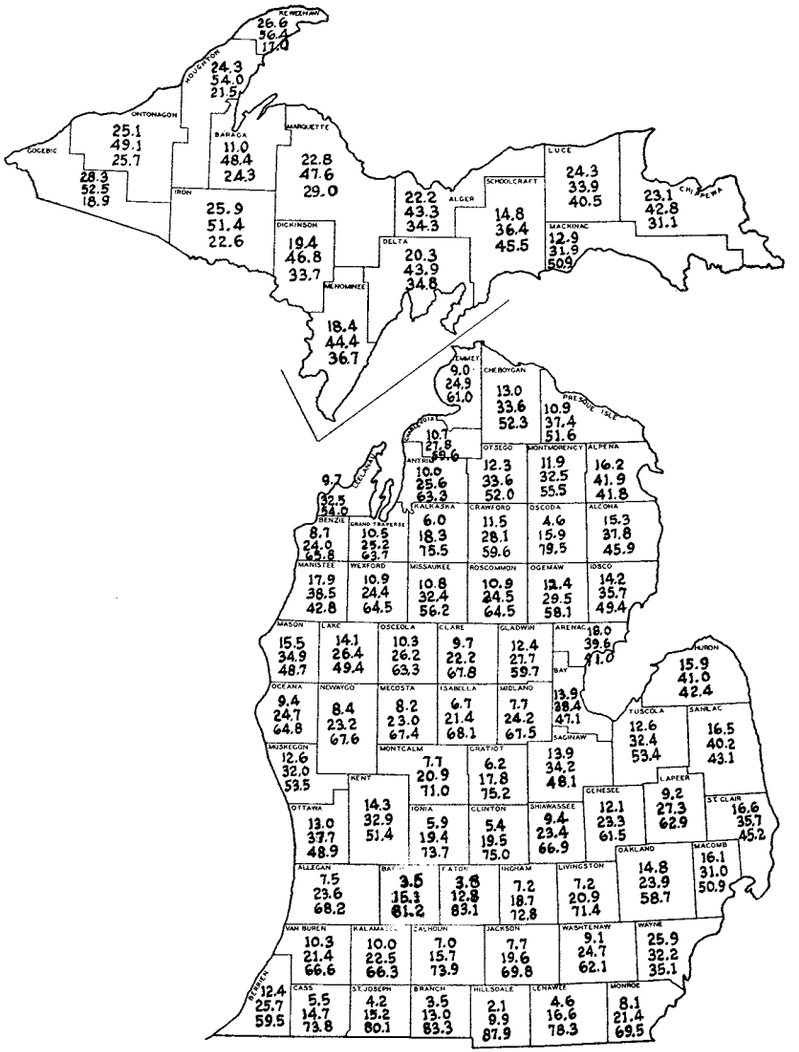


FIGURE 68. PERCENTAGES THAT FOREIGN-BORN WHITE AND NATIVE-WHITE OF FOREIGN OR MIXED PARENTAGE ARE OF THE TOTAL POPULATION, 1930

Top figure—Per cent foreign-born White
Middle figure—Per cent native White of foreign or mixed parentage
Bottom figure—Per cent native White of native parentage

geneity of people of diverse customs, political traditions, religious practices, and educational objectives and standards frequently complicates the normal functioning of community enterprises.

Among the foreign born white residing in the state, Canadians are the most numerous, numbering 202,316 (French Canadians 28,539 and non-French Canadians 173,777). Foreign born from Poland number 119,228; those from Germany, 81,714; England, 62,721; Italy, 43,087; Scotland, 35,257; Russia, 34,348; Netherlands, 32,128; Finland, 27,022; and those from other countries, smaller numbers.

Over four-fifths of the people born in Finland who are residing in Michigan are in the Northern Peninsula. The Scotch and Hungarians are most numerous in the Thumb region, the Czechoslovakians in the Saginaw valley, the Hollanders in Ottawa County and in the counties adjoining it, and the Scandinavians along the upper lake region on the western side of the state. As compared with the United States as a whole, Michigan has proportionately more Canadians, English, Hollanders, Germans, Scotch, Belgians, Poles, Hungarians, Jugo-Slavs, Finns, Roumanians, and Bulgarians.

Marital Status

Many factors affect the marital condition, among which are sex ratio, rural-urban composition, religious preference, occupational activities, and economic conditions. In Michigan 60.6 per cent of the males and 66.0 per cent of the females 15 years old and over are married. In but 16 states is a larger proportion of males married and in but 4 states is a larger proportion of females married. Marriage is generally considered a highly desirable state since among other reasons the death, insanity, crime, and pauperism rates tend to be lower for the married than they are among the single, widowed, and divorced. This is especially true for the men.

Contrary to the general impression, a larger percentage of the present generation is married than was true of the past generation. *Table 12* shows the percentage of males and of females who are married, and the trend since 1890. In 1890, 1900, and 1910 not as

TABLE 12.—Per Cent Married of the Population of Michigan, 15 Years of Age and Over, by Sex: 1890-1930

Census	Males	Females
1890	57.0	63.2
1900	57.4	61.6
1910	58.3	62.2
1920	59.8	65.3
1930	60.6	66.0

large a percentage of the males or of the females were married as in 1920 and 1930. This trend prevails generally in all states.

Also, contrary to general impression, the present generation married at an earlier age than did the past generation. The per cent of those in their late teen age and early twenties in the United States who are married is presented in *Table 13*.

TABLE 13.—Per Cent Married, by Sex and Younger Age Groups, United States: 1890 to 1930 (Source: U. S. Census)

	Males		Females	
	15–19	20–24	15–19	20–24
1890	.5	18.9	9.5	46.7
1900	1.0	21.3	11.0	46.6
1910	1.1	24.0	11.3	49.7
1920	2.1	28.3	12.5	52.3
1930	1.7	28.1	12.6	51.6

Over three times as many boys 15-19 are married at present as in 1890. Of the boys 20-24 about 48 per cent more are married at present than in 1890. In the present generation practically a third more of the girls 15-19 are married than of the past generation. Similar tendencies seem to prevail in this state as in the nation generally. The gradually increasing proportion of married people is a reflection of improving economic conditions, more tolerant divorce laws, emancipation of women, and increasing number and diversity of social contacts.

Number and Size of Families

The census of 1930 indicates that there are 1,180,554 private families, and 2,588 quasi-family groups (institutions, hotels, boarding houses, etc.) in the state. The latter have a total of 104,218 members. The census defines a normal or private family "in general as a group of persons, related either by blood or by marriage or adoption, who live together as one household, usually sharing the same table." The population per family including quasi-family groups is 4.09, and excluding them, 4.01. The average population per family is a cross-section of resident families.

The number of families has been constantly increasing while the average size of the family has been constantly decreasing, as indicated in *Table 14*. The size of the average family in 1850 was one-third larger than in 1930. In 1880 it was one-fifth larger than at present. Increasing urbanization will undoubtedly continue to be one of the more important factors in restricting size of families.

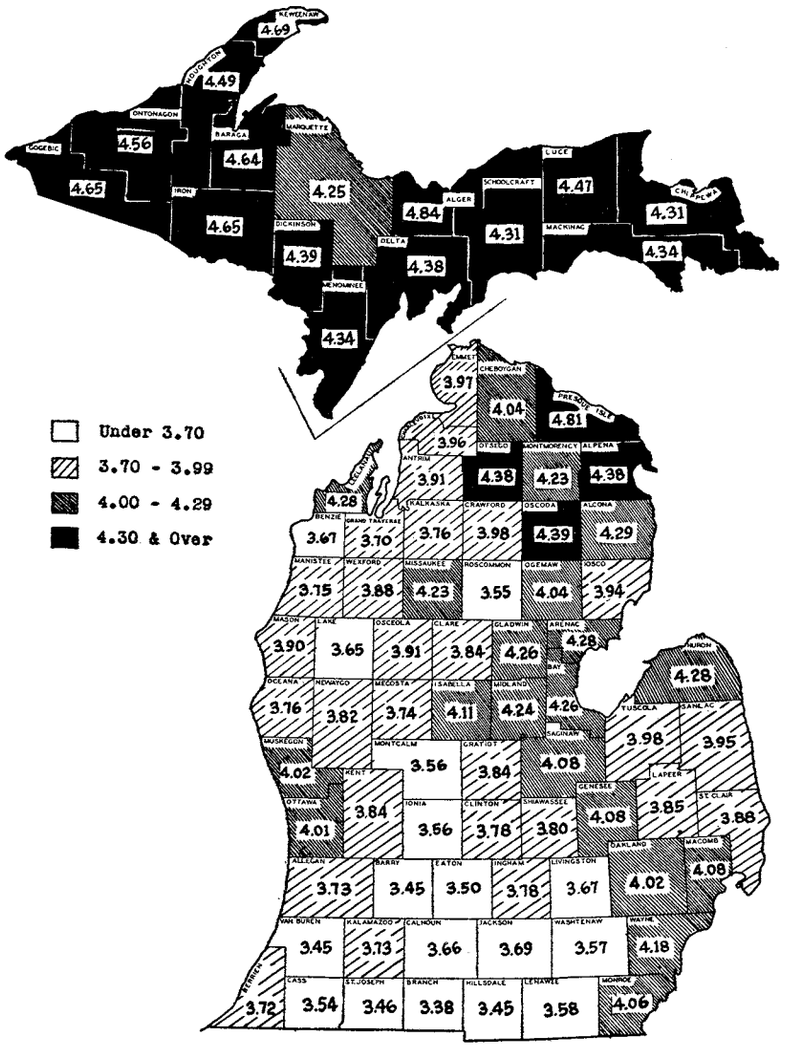


FIGURE 69. AVERAGE SIZE OF FAMILIES, 1930
(Institutional and other quasi-family groups not included)

Families in Northern Michigan, where there are many foreign born, are generally somewhat larger than those in Southern Michigan, 4.44 as compared with 3.99. Families in Alger County average 43 per cent larger in size than those of Branch, the average size in the former being 4.84 persons and in the latter 3.38. The variation in average size of families, by counties, is presented in *Figure 69*.

The state census of Michigan for 1884 and subsequent issues give the number of families, making it possible to determine by counties the extent of decline in the average size of families. A comparison of the average size family in 1884 with that of 1930 (institutional and other quasi-family groups included in both censuses) reveals that in every county except Oscoda, where families for some reason were abnormally small in 1884, in comparison with adjoining counties, families averaged larger in 1884 than in 1930.

TABLE 14.—Number of Families and Average Size, 1850–1930
(Source: Federal Census)

Year	Number of Families*	Average Size
1850	72,611	5.48
1860	146,290	5.17
1870	241,006	4.91
1880	336,973	4.86
1890	455,004	4.60
1900	548,094	4.42
1910	657,418	4.27
1920	862,745	4.25
1930	1,183,142	4.09

*Including quasi-family groups.

Whereas 20 counties had fewer people in 1930 than in 1884, only 7 had fewer families. Numerous counties are decreasing in population yet increasing in number of families. Sanilac County, for example, decreased from a population of 29,583 in 1884 to 27,751 in 1930, a decrease of 6.2 per cent while the number of families increased during that period from 5,876 to 7,022, an increase of 19.5 per cent.

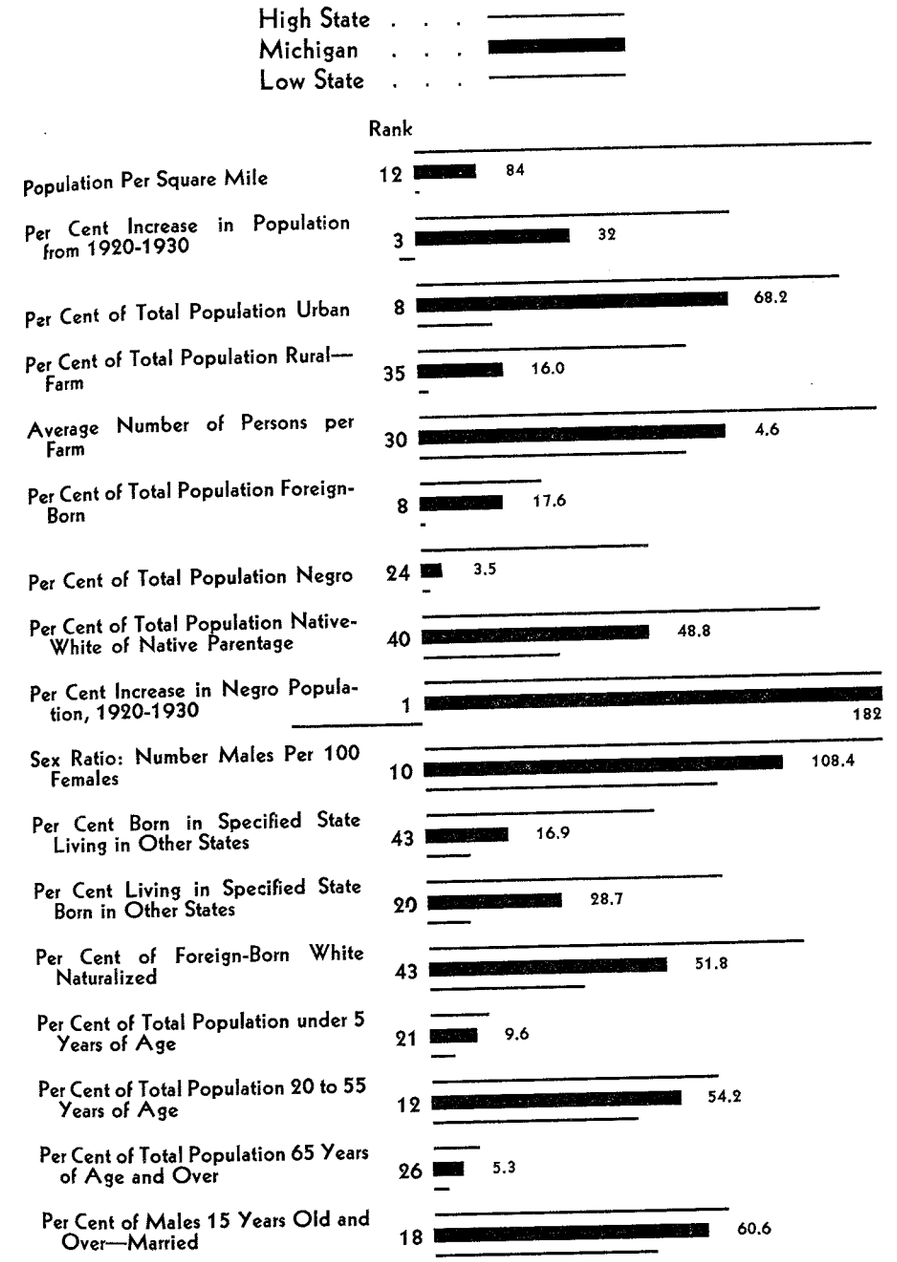
In 1884 the 1,853,658 persons in Michigan were grouped in 403,779 families. In 1930 the same number of persons grouped into families of the present size would comprise 453,217 families or 49,438 more families than in 1884. Or it can be said that in 1884, 218 average families comprised 1,000 persons; in 1930, 244 families comprised 1,000 persons. In other words, 1,000 persons today make up about 26 more families than in 1884.

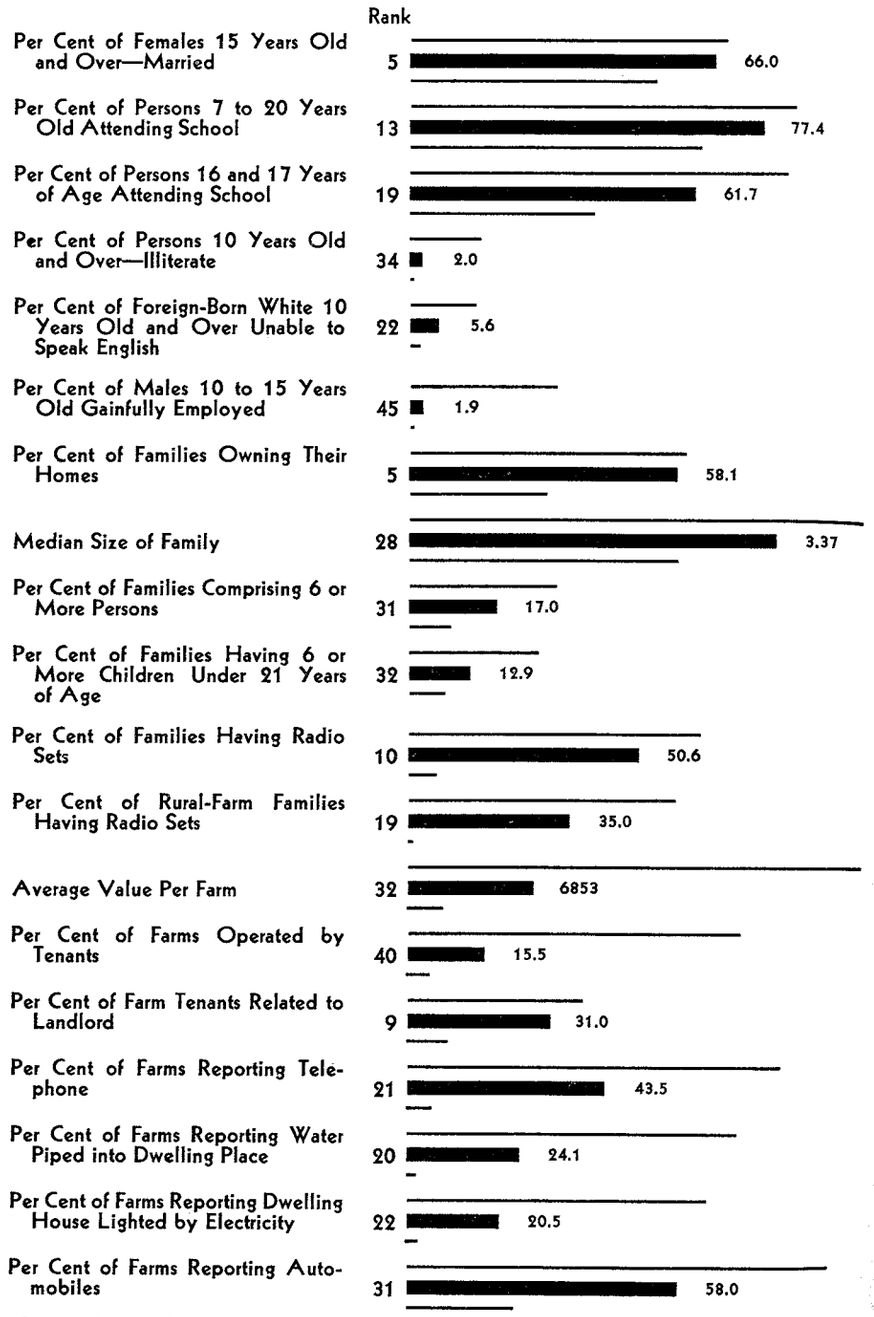
These 14 tables and 7 figures of various aspects of population and population changes and the brief description and interpretation of

some of them will serve to indicate that we are living in a social world different from that of our parents and that our children will live in a still different one. The changes in population in Michigan during the next 50 years may be as great as they have been during the past 50 years.

Educators who appreciate the significance of these population trends will seek to interpret their implications for needful revisions of the curriculum as well as for additions to or consolidation of the school plant.

FIGURE 70. MICHIGAN'S RANKING AMONG THE STATES*





*Source: United States Census, 1930.

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CHAPTER SIX

THE FAMILY

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Family Performs Basic Functions

The family is considered as a basic social institution because its role in modern life is so important. Not only does it provide the accepted pattern for the regulation and expression of sex instincts and regeneration of the human race, but in a very real sense it is a microcosm of human society. Influences of the family affect every aspect of civilization and in turn each major change in civilization has its effect on the family. Throughout the centuries the family as a social institution has existed in various forms and has undergone many changes, but always its basic functions—sex regulation, procreation, rearing and training the future generation, providing security and psychic satisfactions for its individual members—have remained. Despite divorce statistics and sensational headlines the family will not pass away. Its role in modern life is too important for that. There is no substitute for family life.

Modern Conditions Affect Family Life

The family, however, cannot remain immune, nor is it desirable that it should, from the various social changes that occur. As a matter of fact, changes in the last half century have profoundly affected the family. Previous to the time of widespread industrialization the family was to a very great extent a self-sufficing unit. It provided itself with the necessities of food and clothing and gave maintenance to aged or incapacitated members as a matter of course. Socially, too, it was largely self-sufficing as it was the center for many educational, religious, and recreational activities. But social changes have had their effect and the old basis for family life in a measure has disappeared. Certainly the family has declined in importance as a producing unit. Many articles of food and clothing are no longer made by the family. Some persons have interpreted this shift of manufacturing from the home to the factory as being an indication that family life will eventually disappear. Such a conclusion, however, presupposes the assumption that the only basis for family life is the economic one and that if this disappears the family goes also.

This assumption overlooks two important points: (1) the family still performs, with wide variations as to limits and type, many activities of an economic nature such as providing food, shelter, clothing, and such comforts as its circumstances will allow; (2) the family provides numerous services which are ordinarily not considered as being economic but which, nevertheless, are indispensable. These services consist of influences which contribute to personality development. The individual is subjected to circumstances and stimuli of all kinds. Somewhere and somehow these must be interpreted and integrated into a consistent pattern of life. The family environment helps both child and adult to do this. No other agency, not even the school, performs this function so well, if at all. So it is not incorrect to state that while the economic services of the family have decreased, relatively speaking, the services of the family to personality development and social control have increased.

Study of Family Necessary

The implication of this change in the role of the family from the standpoint of education and research means that its function and value should be interpreted anew. There is much need for an understanding of the family in its so-called normal aspects in order that its role may be performed with the least possible difficulty. So much attention has been given to the disorganizing aspects of family life, like divorce and desertion, that its constructive role is sometimes overlooked. It would be good social policy to emphasize the way normal families behave, not overlooking the effect of social problems like unemployment and housing which vitally affect the success of family life.

Median Size of Michigan Families

In the State of Michigan there were in 1930 according to the Fifteenth Census[1] of the United States 1,180,554 families in the entire state. 800,241 of this total resided in urban territory, that is, in incorporated places having a population of more than 2,500. The remainder, 380,313 were classified as rural. This number is further subdivided into rural-farm families and rural non-farm families. There were 183,018 in the former group and 197,295 in the latter. The median size of the rural-farm family in Michigan reported in the Fifteenth Census was 3.66 while the corresponding figure for the urban family was 3.36. The figure for the rural non-farm family was 3.17. The median, of course, is a statistical concept and represents the mid-value in a series. In other words, there were as many fam-

ilies smaller than the median as there were families larger than the median. These differences between urban and rural families are made clearer perhaps when the data for size of family in the various classifications are tabulated by number of persons in the family as in *Table 15*.

TABLE 15.—Size of Families in Rural and Urban Groups*

Size of Family	State		Urban		Rural—Farm		Rural—Non-Farm	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1 person†	82,544	7.0	48,679	6.1	12,758	7.0	21,107	10.7
2 persons	287,845	24.4	197,281	24.7	39,765	21.7	50,799	25.7
3 persons	252,485	21.4	178,695	22.3	34,096	18.6	39,694	20.1
4 persons	212,901	18.0	150,461	18.8	29,948	18.4	32,492	16.5
5 persons	144,049	12.2	98,900	12.4	23,124	12.6	22,025	11.2
6 persons	88,376	7.5	58,143	7.3	16,454	9.0	13,779	7.0
7 persons	50,945	4.3	32,183	4.0	10,813	5.9	7,949	4.0
8 persons	29,281	2.5	17,685	2.2	6,992	3.8	4,604	2.3
9 persons	16,083	1.4	9,376	1.2	4,219	2.3	2,488	1.3
10 persons	8,500	.07	4,753	.6	2,499	1.4	1,248	.6
11 persons	4,168	.04	2,249	.3	1,299	.7	642	.3
12 or more	3,377	.03	1,836	.2	1,073	.6	468	.2

*Source of data: Fifteenth Census, Population Bulletin, Families.
†Persons living alone were counted as a family in the Census.

It is evident that the percentages for the rural-farm group are higher than either those of the rural-non-farm or urban group for all families having five or more persons. The highest percentages for three or four persons per family are in the urban group while a one-person or two-person family occurs most frequently in the rural non-farm group. It is beyond the scope of the census report to suggest reasons for these differences. However, a few circumstances that seemingly are important in this connection may be mentioned. It often happens that relatives in addition to the immediate family consisting of husband, wife, and children will live with the farm family. They may be the aged parents of the husband or wife, or, as is frequently true, other relatives may stay with the family receiving in addition to board and lodging some remuneration for the work which they do. These additions plus the fact that the farm family has as many or more children than a majority of urban families would partially account for the occurrence of larger families in the rural farm group. The comparatively high percentage of one-person and two-person families in the rural non-farm population is not surprising. It has been generally recognized for a long time that a relatively high proportion of persons over 65 years of age and incomplete families of various kinds reside in small towns.[4]

Number of Children in Rural Farm Families

Table 16 supplies data regarding the number of children in families in these population groups. There is ample evidence in the figures of this table to support the generalization that farm families as a group have more children than either the urban or the rural non-farm group. Eleven and six-tenths per cent of the farm families have five or more children under 21 years of age, whereas the corresponding figure for the urban family is 5.8 per cent and for the rural non-farm family, 7.1. On the other hand, the percentage of rural-farm families having no children is lower than for the rural non-farm group and is approximately equal to the percentage for urban families. About one-half (50.6 per cent) of the rural-farm families have from one to four children. This fact should correct any impression that the rural farm family is always a large family.

TABLE 16.—Percentage of Families Having Designated Number of Children under 21 Years of Age in the Rural and Urban Population of Michigan*

Number of Children	State 1,180,554 Families	Urban 800,241 Families	Rural Farm 183,018 Families	Rural Non-Farm 197,295 Families
No children under 21	38.6	38.0	37.8	41.9
1 child under 21	21.6	22.6	17.5	19.5
2 children under 21	16.8	17.6	14.9	15.5
3 children under 21	10.3	10.3	10.7	9.9
4 children under 21	6.0	5.6	7.5	6.0
5 children under 21	3.3	3.0	4.8	3.4
6 to 8 children under 21	3.3	2.6	6.0	3.4
9 or more children under 21	.3	.2	.8	.3

*Source of data: Fifteenth Census, Population Bulletin, Families.

Population Trends Summarized

In 1930, 96.5 per cent of all families in Michigan were classified in the census as white. Three and one-tenth per cent, or a total of 36,500, were Negro families. 28.8 per cent were foreign-born. In 1900, 99 per cent of the families were white, and 0.7 per cent, or 3,706 families, were Negro. In that year 38.6 per cent were foreign-born. It is thus evident that the proportion of foreign-born families is decreasing and that the number of Negro families has increased. Undoubtedly industrial development of the state in recent decades has caused the increase in the Negro population.

Adequate Housing a Serious Problem for Many Families

Certain social problems affecting family life have been mentioned in a preceding paragraph. One of these is housing. This problem is serious, especially in rural areas, where there is need for more