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Geographical Survey of Grant County, North Dakota

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A GEOGRAPHICAL SURVEY OF

GRANT COUNTY, NORTH DAKOTA

by

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This thesis submitted by Gary E. Johnson in partial fulfillment of the requirements for the Degree of Master of Science in the University of North Dakota is hereby approved by the Committee under whom the work has been done.

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PREFACE

This study is a result of the author's residence in Grant County for the early years of his life and his continued interest and association with the area up to the present time. Furthermore, it is his contention, based upon recent analyses of the area in question, that a complete geographically correlated study of Grant County is not available. In view of the fact that only a limited number of articles and publications are available which involve separate and varied aspects of county facts and conditions, this study is a presentation of a relatively complete geographic study of Grant County in the realms of physical, economic, and cultural geography.

It must be noted however, that this study is designed to encompass the entire county and in that regard no attempt has been made to explore in micro detail any one portion of the geographic attributes of the area.

The intention of the author is to present a basically complete geographic study of Grant County. In attaining this goal, the county will be examined from the standpoint of the three major realms of geography (physical, economic, and cultural), trends will be noted, comparisons will be made, conclusions will be drawn, and potentials for future development will be examined and explained.

The author wishes to express his deepest appreciation to the members of the examining committee for their suggestions and guidance. The committee mambers include Duane L. Younggren, Chairman, Dr. Bernt L. Wills, and Dr. Henry J. Tomasek.

Appreciation is also extended to the following people whose assistance made much of this thesis possible. Mr. Ralph Dietrich, Director Grant County Soil Conservation Service; Mr. Herman Haas, Office Manger, Grant County Agricultural Stabalization and Conservation Office; various county offices which provided valuable information and several state agencies including the Economic Development Commission and the State Climatologist for their valued assistance.

Sincerest appreciation is also extended to the author's wife, Diana, for her encouragement, patience, and many hours of typing in the preparation of this thesis.

Gary E. Johnson

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST OF TABLES

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS (Cont'd.)

ABSTRACT

The purpose of this study is to present a geographic survey of Grant County, North Dakota, in the areas of physical, economic, and cultural geography.

Procedures utilized involved a gathering of source material from libraries and various state and county officials. All gathered material was read and analyzed, a ground survey of the county was made, photographs were taken, and maps were compiled from gathered information.

Grant County is located in south-western North Dakota on the Missouri Plateau. The county is irregular in shape and has an area of 1,672 square miles. The area has a mid-continental, BSw climate. January temperatures average 12.2° and July averages 70.6°. Average annual precipitation is 16.46 inches.

The topography of the county exhibits great variation but may generally be classified as gently rolling. Morton and Bainville are the predominant soil types.

Water resources are limited to a few permanent rivers, one large lake, stock dams and intermittent streams.

The economy of Grant County is primarily agricultural. Livestock and cash-grain farms dominate. Mineral resources are limited with the exception of lignite.

The population of Grant County began to decline in 1930, a trend which still continues. The 1960 population of the county was 6,248. Permanent settlement in the area began about 1900 and began on a large

scale in 1910.

The county has an adequate transportation system, a reasonably well developed school system and limited but varied recreational facilities.

INTRODUCTION

The systematic approach to the study of regional geography is one of the most widely accepted methods utilized by geographers and members of associated sciences for presenting the geography of any area, large or small. Political units lend themselves well to the systematic regional approach of study and because of the acceptability of the method it will be followed throughout this thesis.

The thesis will show Grant County to be an area of contrast in nearly all facets of geographic comparison. For example, Grant County topography ranges from nearly level, fertile areas to practically worthless clay buttes that rise above the surrounding terrain. This thesis will also point out the role of agriculture in this typically rural county and the economic dependence of the entire area upon it.

Since a geographic survey of Grant County has never been attempted, to the best of the author's knowledge, the gathering of available data and research material began at a most elementary level. Libraries were investigated to locate any data pertaining to the county. County and state governmental agencies were contacted; a source providing considerable material pertaining to the area. Personal interviews were conducted with numerous state and county officials and many matters relating to the county and affecting the compilation of this study were clarified.

After available source material was collected, a ground survey of the county was conducted, photographs were taken, and all collected material was researched, correlated, and compiled into the following thesis.

CHAPTER I

PHYSICAL GEOGRAPHY OF GRANT COUNTY

Location, Size and Shape

Grant County is located in the southwestern quarter of North Dakota in the physiographic portion of the state known as the Missouri Plateau or Missouri Slope. Politically, the county shares borders with five additional counties; Morton County on the north and east, Sioux County on the south, and Adams, Hettinger, and Stark Counties on the west.[1]

Geographically the boundaries of Grant County include the Cedar and Cannonball Rivers on the south which separate Grant and Sioux Counties. The remaining boundaries are formed by parallels and meridians of the Congressional Township System. The maximum county extent ranges from 46° 03' to 46° 42' north latitude and from 101° 05' to 102° 00' west longitude.[2]

Grant County occupies an area of 1,672 square miles or slightly over one million acres (1,070,080 acres).[3] The maximum north-south distance in the county is 48.7 miles while the maximum east-west distance is 48.0 miles.[4] The county contains 50 Congressional Townships, two of

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[1]North Dakota, Official Highway Map, 1966.

[2]The Reader's Digest Association, Great World Atlas (Pleasantville, New York: The Reader's Digest Association, 1963), p. 58.

[3]U. S., Bureau of the Census, County and City Data Book, 1962, "A Statistical Abstract Supplement" (Washington: U. S. Government Printing Office, 1963), p. 272.

[4]Grant County Highway Map, 1962.

which are larger than the standard six mile square, 640 acre township and seven which are slightly smaller than 640 acres. An additional 41 townships conform to standard size.[5]

The preceeding discussion may lead the reader to envision a rectangular, compact county. This however, is not the case and any classification of the shape of the county must be categorized as irregular. While maximum distances from border to border are nearly equal, other distances vary from a minimum north-south extant of approximately one mile in the east to a minimum extent of six miles along one segment of the western border.[6] This marked degree of irregularity stems from two major factors. The first involves the fact that the southern boundary is composed of two meandering rivers which flow in an irregular northeast direction. The second cause of the obviously irregular shape may be attributed to the Continental Congress which authorized the Congressional Township System in 1785.[7] This system established governing lines (base lines) as reference lines to be extended into unsurveyed localities. From these base lines, a system of standard parallels (guide meridians) were established at practicable intervals (usually 24 miles) to facilitate further subdivision into townships and sections. In laying out townships, account was taken of the convergence of meridians towards the earths poles and correction lines were established at frequent intervals. This further accounts for the irregular shape of the county since some tiers of townships do not line up with the tier immediately above or below them.

A compact, rectangular county could have been created, as many of

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[5]Ibid.

[6]Ibid.

[7]H. Arnold Karo, "Surveying" Encyclopedia Americana, Volume 26 (1966), p. 96.

GRANT COUNTY

Scale 1:500,000

Fig. 1.--Location, size and shape of Grant County, North Dakota.

the 53 counties in the state are regular and compact. However, this study deals with the present situation and will not speculate on the rationalization of our forefathers.

Figure 1 indicates the location, size and shape of Grant County with respect to the state of North Dakota.

Climate

According to Koppen, the noted German biologist who developed the most widespread climatic classification now in use, Grant County has a humid continental, cool summer, type of climate.[8] Grant County is actually located in a transition zone between a BSw climatic type (semi-arid with a dry winter) and a Dfb climatic type (severe winter; moist all seasons; short, warm summer).[9] For the purposes of this thesis, the climatic classification of Grant County will be considered as a modified BSw type since available county weather data most nearly approaches the climatic values established for that type of climate. In this type of climate, the seasons are pronounced and rapid changes in daily weather patterns occur frequently. Also, in this climatic type, evaporation generally exceeds precipitation at all times throughout the year.[10] This further substantiates climatic categorization in the semi-arid type. Located in a mid-continental type of climate, extremes in all weather phenomina are not uncommon.

To the best knowledge of the author, the county seat of Carson

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[8]Howard J. Critchfield, General Climatology (Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1960), p. 174.

[9]Sverre Petterssen, Introduction to Meteorology (New York: McGraw-Hill Book Company, Inc., 1958), p. 169.

[10]Melvin E.Kazeck, North Dakota: A Human and Economic Geography (Fargo, The Lund Press, 1956), p. 126.

posesses the only recording weather station within the county. Because of its central location in Grant County, the data obtained from the "Carson Climatic Summary" will be considered as representative of county climatic conditions. This summary is based upon 53 years of station records.

Temperature

The temperature data for Grant County (Carson) is compiled in Table 1. It will be noted that the highest temperature ever recorded at the station was 116° in July of 1936 while the record low at Carson was -43° in February of the same year, 1936. From these two figures it will be noted that the greatest annual range in temperature, 159 degrees, occured in 1936. However, the normal average annual range in temperature is 58.4° which is the difference between the January monthly average of 12.2° and the July monthly average of 70.6°.

Another factor to consider, as pointed out in Table 1, is normal degree days. This quantity is computed by subtracting the mean temperature for each day from 65°.[11] For example, on a day when the mean temperature is 50°, the corresponding value is 15 degree days. If the mean temperature is 65° or greater, the number of degree days is zero. Since the consumption of heating fuel is closely related to this quantity, the figure is useful for estimating fuel consumption for each degree day unit.

Carson has an average of 27 days a year when the maximum temperature is over 90° and an average of 77 days when the maximum daily temperature is less than 32°. As far as minimum temperatures are concerned, there is an average of 190 days when the daily minimum temperature is below

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[11]James E. Miller, "Meteorology", Encyclopedia Americana, (1966), p. 721e.

TABLE 1

TEMPERATURE SUMMARY: CARSON, NORTH DAKOTA[a]

Month	Normal			Extreme			
	Daily Maximum	Daily Minimum	Monthly Average	Record Highest	Year	Record Lowest	Year
Jan.	22.3	2.1	12.2	68	1931	-40	1943
Feb.	26.2	4.1	15.2	68	1932	-43	1936
Mar.	36.8	14.7	25.8	83	1939	-32	1962
Apr.	55.2	29.4	42.3	93	1913	-5	1936
May	67.7	40.6	54.2	106	1934	14	1945
Jun.	76.2	50.1	63.2	108	1936	28	1919
Jul.	85.2	55.9	70.6	116	1936	29	1925
Aug.	83.9	53.6	68.8	109	1941	26	1914
Sep.	72.7	43.2	58.0	105	1948	10	1926
Oct.	59.8	32.1	46.0	98	1922	-16	1925
Nov.	41.2	18.1	29.7	75	1917	-24	1940
Dec.	27.3	6.2	16.8	68	1939	-38	1924
Yr.	54.5	29.2	41.9	116	1936	-43	1936

[a]Data from North Dakota State Climatologist, Municipal Airport, Bismarck, North Dakota.

TABLE 1--Continued

Normal Degree Days	Mean Number of Days			
	Maximum Temp.		Minimum Temp.	
	Over 90°	Under 32°	Under 32°	Under 0°
1659	0	21	31	16
1406	0	18	28	11
1228	0	11	29	5
675	0	1	19	0
357	1	0	5	0
138	3	0	0	0
31	11	0	0	0
40	9	0	0	0
225	3	0	3	0
580	0	1	16	0
1077	0	7	28	3
1426	0	18	31	10
8842	27	77	190	45

32° and 45 days when this minimum value is below 0°.

The temperatures of Grant County are among the warmest in the state as confirmed by the fact that the mean annual temperature is 41.9° as compared to a state mean annual temperature of 39°.[12] Summer temperatures average up to 70.6° in the warmest month of July and normally the summer temperatures are consistently high. Winter temperatures in the county are generally less severe than in many other portions of the state because many of the sharp outbreaks of cold air from the Arctic regions never reach the area.[13] Furthermore, warm southwesterly winds and westerly chinook winds often bring above freezing temperatures to the area while eastern portions of North Dakota are experiencing below zero weather.

Temperatures of above 90° and below -30° are not uncommon; they are, in fact, recorded nearly every year. These heat waves and cold spells, as compared to other sections of the upper midwest, are usually of short duration.[14]

Precipitation

Precipitation data for Grant County (Carson) is presented in Table 2. The average annual precipitation for the station is 16.46 inches with the maximum monthly amount of precipitation ever recorded at 13.28 inches in June of 1914. Minimum precipitation amounts have ranged from one half inch in June of 1936 down to no recorded precipitation for a complete month on several occasions (Table 2). The average annual snowfall at Carson is 30.6 inches and the maximum monthly total was 24.5 inches

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[12]Kazeck, loc. cit., p. 128.

[13]Ibid.

[14]Ibid.

TABLE 2

PRECIPITATION SUMMARY: CARSON, NORTH DAKOTA[a]

Month	Rain or Water Equalivent of Snow						
	Normal Total	Monthly Maximum	Year	Monthly Minimum	Year	Maximum 24 Hours	Year
Jan.	0.42	1.75	1949	0.00	1940	0.88	1949
Feb.	0.42	2.00	1922	0.00	1914	1.29	1951
Mar.	0.79	2.70	1942	T*	1957	1.10	1946
Apr.	1.45	5.02	1940	0.00	1952	1.70	1964
May	2.40	6.01	1962	0.25	1924	1.66	1912
Jun.	3.88	13.28	1914	0.50	1936	3.60	1964
Jul.	2.15	5.82	1923	0.33	1929	2.25	1923
Aug.	1.57	4.04	1951	0.10	1934	1.80	1945
Sep.	1.47	4.79	1923	0.00	1948	2.05	1941
Oct.	0.94	3.18	1946	0.00	1945	2.45	1915
Nov.	0.57	2.76	1944	0.00	1963	1.43	1956
Dec.	0.40	1.25	1918	T	1954	0.64	1922
Yr.	16.46	13.28	1914	--	--	3.60	1964

[a]Data from North Dakota State Climatologist, Municipal Airport Bismarck, North Dakota.

*Trace of precipitation.

TABLE 2--Continued

Snow and Sleet				
Mean Total	Monthly Maximum	Year	Maximum 24 Hours	Year
4.9	22.2	1949	7.0	1938
4.7	20.0	1922	12.0	1951
6.9	24.5	1950	13.2	1943
3.0	13.0	1947	6.0	1947
0.8	8.0	1950	6.0	1950
0.0	3.5	1943	3.5	1943
0.0	0.0	---	0.0	---
0.0	0.0	---	0.0	---
0.2	5.0	1934	5.0	1934
1.7	11.5	1946	7.0	1951
4.0	17.0	1958	11.0	1958
4.4	14.0	1927	8.0	1922
30.6	24.5	1950	13.2	1943

in 1950. Maximum precipitation data for 24 hours include 3.60 inches of rain in June of 1964 and 13.2 inches of snow in March of 1943.

In Grant County, as well as the entire state, precipitation is considered to be the most important climatic factor because of the dependence of the area upon rain at the proper time to support the agricultural economy. Most moisture in the county occurs as convective type, thunder shower, precipitation during the summer months.[15] Considerable summer rain as well as much of the winter snow is due to cyclonic activity (air mass weather which involves fronts and frontal activity producing precipitation).[16]

Approximately 77 percent of precipitation recieved in the county occurs during the six warmer months of the growing season (April through September).[17] Nearly one-half (49.7 percent) of the precipitation falls during May, June, and July. It is during these three important crop growing months that the rainfall is most needed and effective.

Grant County is more arid than precipitation figures may show because the dry summer air reduces the efficiency of rainfall due to the high rate of evaporation which occurs following most summer showers.[18] Furthermore, climatic statistics reveal that the less precipitation an area recieves, the greater will be the rainfall variation the area may expect from year to year. This is certainly the case in Grant County with recorded extremes of wet and dry years.

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[15]Ibid.

[16]Ibid.

[17]Rex Helfinstine and L. W. Schaffner, Irrigation and Dryland Farming Can Work Together on the Cannonball River (Fargo: North Dakota State University, 1953), p. 9.

[18]Kazeck, loc. cit., p. 126.

Other Climatic Features

There are additional climatic features which play an important role besides the elements of temperature and precipitation. These are the only weather elements observed and recorded at the Carson station so one must generalize to a degree, the climatic factors of the Missouri Slope area to obtain approximations for other climatic elements.

Relative Humidity

The importance of relative humidity lies in the realm of human comfort. In extremely hot or cold weather, a low percentage of relative humidity will make the extreme more bearable. The average relative humidity for the state as a whole is about 68 percent, slightly lower in the west than in the east.[19] One may assume that the approximate relative humidity for Grant County would average about 65 percent since variations across the state are not high.

Wind

The prevailing wind direction in North Dakota is from the northwest. Winds tend to be more southerly during the summer than during the winter and higher wind speeds are recorded in the spring with the lowest readings in late summer. The average annual wind speed for North Dakota as a whole is approximately 11 miles per hour.[20]

Frost Free Season

Grant County has a frost free or growing season of 119 days.[21]

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[19]N. D., Economic Development Commission, Here is the New North Dakota (Bismarck: North Dakota Economic Development Commission, 1966), p. 6.

[20]Ibid.

[21]U. S., Department of Agriculture, Climate and Man (Washington D. C.: U. S. Department of Agriculture, 1941), p. 1045.

The average date of the last killing frost in the spring is May 20 and the average date of the first killing frost in the fall occurs on September 16. In total days, this may seem like a short growing season, but the 15 hours of sunshine or more that occur on a clear day from the middle of May to the end of July make it possible to produce many crop varieties.[22]

In conclusion, it may be noted that the continental climate of Grant County, while tending towards extremes, is a climate which is invigorating and one which produces variety from day to day as well as from season to season.

Topography

Geologic History

The geologic history of Grant County, as well as all of North Dakota, has consisted of repeatedly transgressing and regressing seas which have deposited layer after layer of sediments within a progressively subsiding basin.[23] The deepest portion of this basin is the "Williston Basin" of which Grant County is a part.[24] During periods of submersion, layers of sandstone, shale, and limestone were deposited. The abundance of marine organisims in the layers developed into oil during the Paleozic era some 350 million years ago.[25] The successive submergence and uplift of North Dakota ended about the time of glaciation during the Pleistocene

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[22]N. D., Economic Development Commission, loc. cit.

[23]John L. Hainer, The Geology of North Dakota (Grand Forks: North Dakota Geological Survey, 1956), p. 21.

[24]Ibid.

[25]Bernt L. Wills, North Dakota, The Northern Prairie State (Grand Forks, North Dakota: Bernt L. Wills, 1963), p. 25.

GRANT COUNTY
GLACIAL FEATURES

Outwash Deposits

Ground Moraine Deposits

Unglaciated Area

Maximum Ice Advance

Scale: 1:500,000

Fig. 2

epoch of the Quarternary period, about one million years ago.[26]

The present topographic features of Grant County are a result of erosional features which started during the Tertiary erosion cycle and continued to the Pliestocene epoch.[27] This period covers about 59,990,000 years; it began approximately 60 million years ago and ended about 10,000 years ago. The Tertiary erosion cycle plus the post-Tertiary erosion and the absence of recent glaciation over most of the county are the major factors accounting for the present landscape of Grant County.

Glacial History

Grant County is located on the southern boundary line of the maximum advance of the glaciers during the Pliestocene epoch. During this epoch there were four major ages of glaciation; from the oldest to the youngest, they have been named the Nebraskan, Kansan, Illinoian, and Wisconsin.[28] The ground moraine deposits of Grant County are assumed to have been deposited by one of the older ice sheets of the epoch, possibly as early as Kansan glacial time.[29]

Figure 2 illustrates the glacial features of Grant County. The present topography of the unglaciated area is a result of the Tertiary erosion cycle as previously mentioned. The remaining topography of the county is mostly a result of the erosion cycle also, but it has been influenced to a degree by the glacial ice sheet. The ground moraine deposits (material deposited by a glacier) are often called drift or

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[26]Ibid.

[27]Kazeck, loc. cit., p. 123.

[28]Hainer, loc. cit.

[29]Kazeck, loc. cit., p. 27.

Fig. 3.--Heart River Hills.

Fig. 4.--Pretty Rock Butte.

Fig. 5.--Heart Butte.

Fig. 6.--Paradise Flat.

till. These deposits are hundreds of feet thick in portions of the state, but south and east of the Missouri River they taper off to a thin sheet of drift as the limit of glacial advancement is approached.[30] Thus, the ground moraine deposits of Grant County are comparatively thin in relation to deposits found to the east. The outwash deposits of Grant County were formed when the glacier began to melt and retreat. Large quantities of water were released from the glacier and they flowed down the major streams and rivers of the county carrying huge loads of outwash material in suspension. This material was deposited in the stream and river valleys of the area and built up multiple layers, primarily sand and gravel.

Present Topography

The present topography of Grant County is one of gently rolling hills, flat topped buttes, and steep, broad river valleys. There are also limited areas of nearly level land, locally referred to as "flats", which rise above the surrounding terrain. The elevation of the county averages about 2200 feet above sea level while the river valleys average 2000 feet above sea level and some of the buttes extend to over 2800 feet above sea level.[31] The highest point in the county is Pretty Rock Butte which rises to an elevation of 2823 feet.[32] The buttes of the county were formed as factors of erosion removed comparatively soft material from around the harder, rock capped areas. As erosion continued, the surrounding landscape was worn away, leaving the many buttes towering

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[30]Wills, loc. cit., p. 27.

[31]U. S. Air Force, USAF Operational Navigation Chart (St. Louis: Aeronautical Chart and Information Center, 1963).

[32]Ibid.

above the general level of the land.[33]

Soils

A complete soils map of Grant County has not been compiled, however, the soils of the county are reasonably well classified. The map on soils (Fig. 7) has been compiled from information obtained from the Grant County portion of the General Soil Map of North Dakota.

The soils of Grant County are all of the Chestnut family.[34] Chestnut soils are similiar to the rich Chernozem soils of eastern North Dakota but they contain less humus, tend to be lighter in color, are made up of a prismatic structure, and are less fertile than the Chernozem soils.[35] Chestnut soils are quite productive however, when adequate moisture is recieved.

It should be noted that the Chestnut soils of the county are made up of two major classifications, the dark brown soils of semiarid grasslands and the soils of hilly and steep lands. Grant County also has six major soil types and many subtypes which have been classified but have not been completely mapped.

The Morton and Bainville soil types are the major soils found on the semiarid grassland and hilly and steep lands respectively. Morton soils have about an 8 inch A horizon or dark brown surface soil, the B horizon generally gets lighter with depth, and the soil is usually friable (easily crumbled).[36] The soil is a silt loam and the C horizon is

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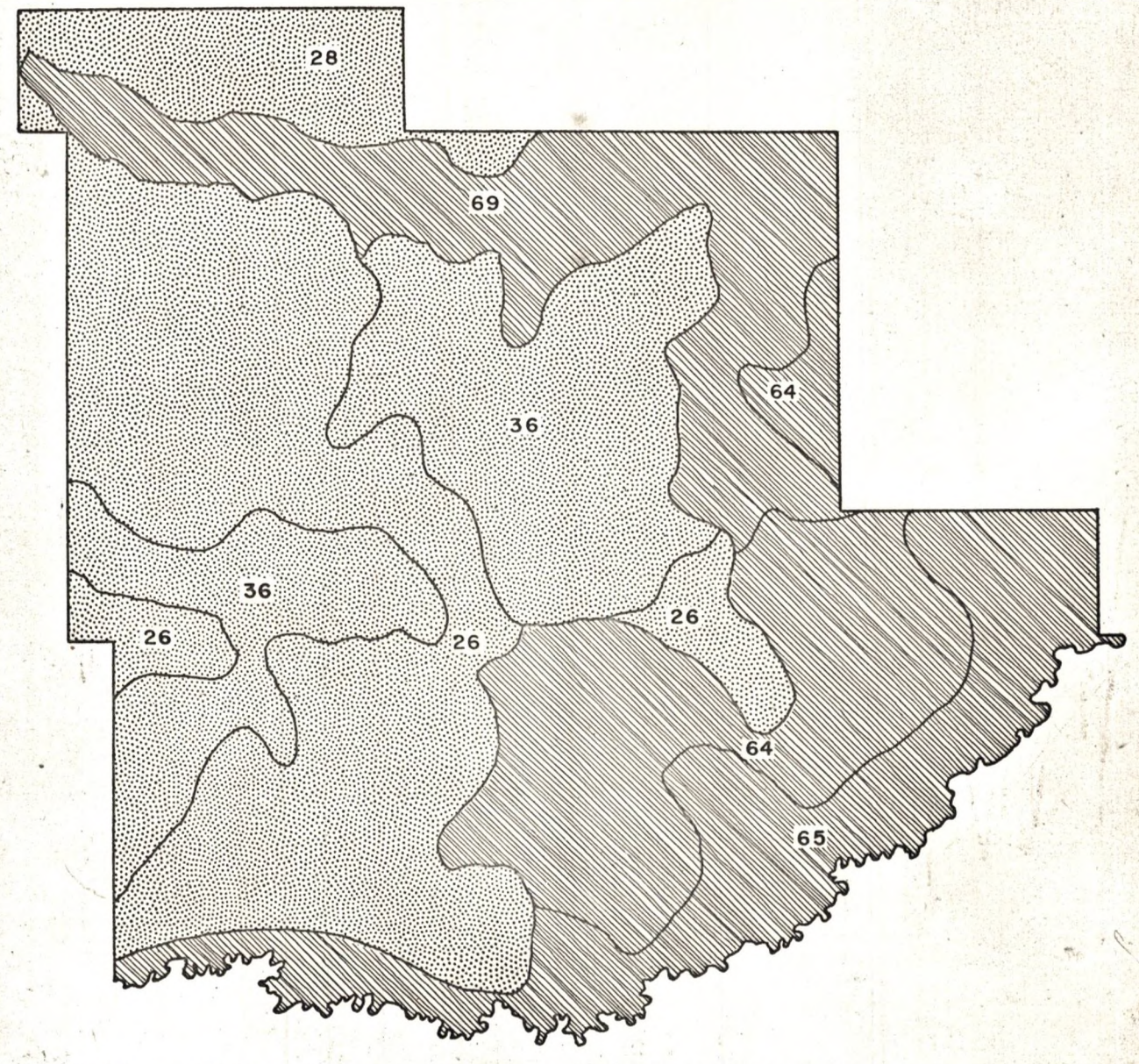
[33]Authur N. Strahler, Physical Geography (New York: John Wiley and Sons, Inc., 1961), p. 456.

[34]Wills, loc. cit., p. 52.

[35]Strahler, loc. cit., p. 252.

[36]Wills, loc. cit.

GRANT COUNTY
SOILS



Dark Brown Soils (Semiarid Grassland)

26 Morton
28 Morton-Rhoades
36 Vebar

Hilly and Steep Land

64 Bainville-Morton
65 Bainville-Rhoades
69 Flasher-Vebar

Scale: 1:500,000

Fig. 7

composed of sandstone or shale.[37] Bainville soils are also developed on sandstone or shale but the type is found principally on hilly or broken land; the horizons of the Bainville type tend to be thin and organic matter is often deficient.[38] The four additional soil types found in the county are basically combinations with the Morton or Bainville types which are silt loams. The remaining types are sandy and fine sandy loams.

In Grant County, typical of the slope area, nearly every hilltop, valley, and slope has its own soil sub-type, each with its certain crop potentials and limitations.[39]

General Land Resources

The land resource map is a generalized classification of the soils and land types of Grant County. The county is divided into four land types. Each area has a limited number of soils which predominate; other numerous soils classifications occur but are not extensive and are not important to a generalized classification.[40] However, these minor soils are important when considering the soil resources of an individual ranch or farm. Even though one soil type and land topography will predominate in an area, intermingled throughout the area will be smaller acreages of other soil types and land resources.

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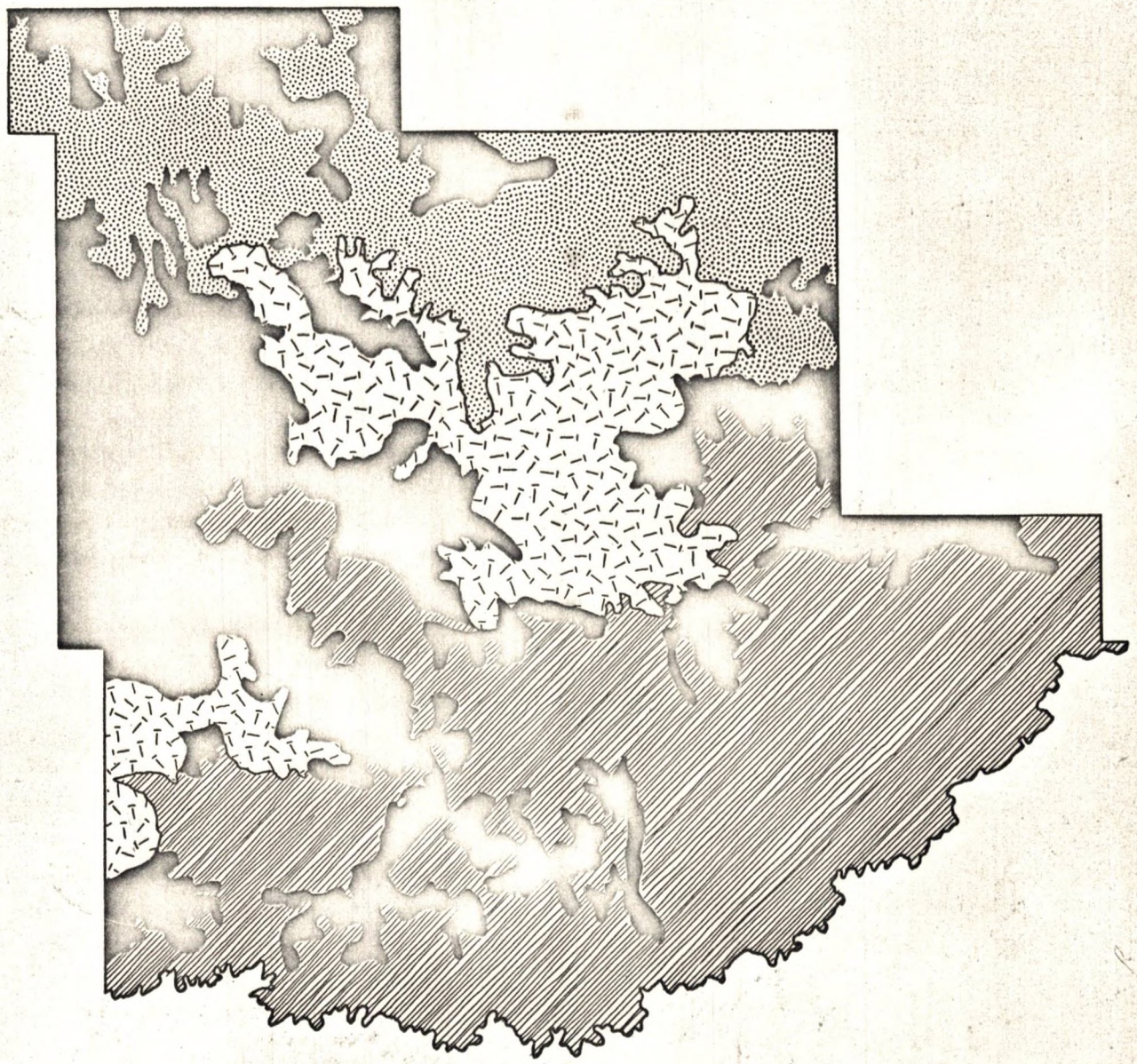
[37] Ibid.

[38] Ibid.

[39] Kazeck, loc. cit., p. 131.

[40] All specific information presented in regard to land resources was obtained from the Grant County Soil Conservation Service, Carson, North Dakota.

GRANT COUNTY
GENERAL LAND RESOURCES



Sandy Lands

Silty Plains

Cannonball Hills

Heart River Hills

Scale: 1:500,000

Fig. 8

Silty Plains

This area includes nearly level to gently rolling areas of loamy and clay loam soils of the uplands. These soils have been subjected to slight to moderate erosion. Water erosion is a problem on the steeper slopes or long slopes of the nearly level land. Morton silt loam, Morton clay loam, and Williams loam soils occupy the greater part of the area. Soils of lesser acreage include some steeply sloping soils, soils with claypan spots and some sandy soils.

Heart River Hills

This area includes the steeply sloping land and rough breaks adjacent to the Heart River. Much of the area is occupied by thin medium textured or loamy soils and sandy soils too steep for cultivation. Some of the very steep, sandstone capped hills and buttes are subject to severe erosion hazards if grazing is not carefully managed. The greater part of the area includes Bainville and Flasher soils. The less extensive soils are loamy soils such as Morton loam and sandy soils such as Vebar fine sandy loam which are suitable for cultivation.

Sandy Lands

The two areas shown as sandy lands are predominately soils with a fine sandy loam to loamy sand texture on level to gently rolling slopes. The soils are more conducive to crops than loamy soils. The fine sandy loam soils are well adapted to small grains and corn if erosion control practices are used. The loamy sands are very susceptible to wind erosion and are best used for grass production or occasional cropping. Other soils found in these areas include gently rolling medium textured soils and some steeply sloping sandy and medium textured soils.

Fig. 9.---Silty Plains.

Fig. 10.---Heart River Hills.

Fig. 11.--Sandy Lands.

Fig. 12.--Cannonball Hills.

Cannonball Hills

This area includes steeply sloping and very steep medium textured and sandy soils. Generally speaking, this area is not as steep as the Heart Butte Hills area. Much of this land is not suitable for cultivation. Some of the rough broken land requires careful management of grazing practices to control erosion. The most extensive soils are the Bainville and Flasher soils. Less extensive soils include medium textured upland soils, some claypan or "scabby" soils and complexes or mixtures of "scabby" soils with normal upland soils.

Water Features

In a dry climate area such as Grant County, evaporation exceeds precipitation throughout the year. As a result of this water deficiency, a water surplus with which to maintain a constant ground water supply is not readily available. Thus, permanent streams have difficulties originating in such areas.[41]

Most of the streams of Grant County are not permanent, but are classified as intermittent and flow only during the wet seasons. The only relatively permanent creeks and rivers of Grant County include the Antelope Creek, Cedar River, Heart River and Cannonball River (Fig. 13). Antelope Creek is a small water body which generally flows all year long. It enters the county from the west and joins the Heart River below Heart Butte Dam. The creek flows along for somewhat over 35 miles in the county. The Cedar River forms part of the southern boundary of Grant

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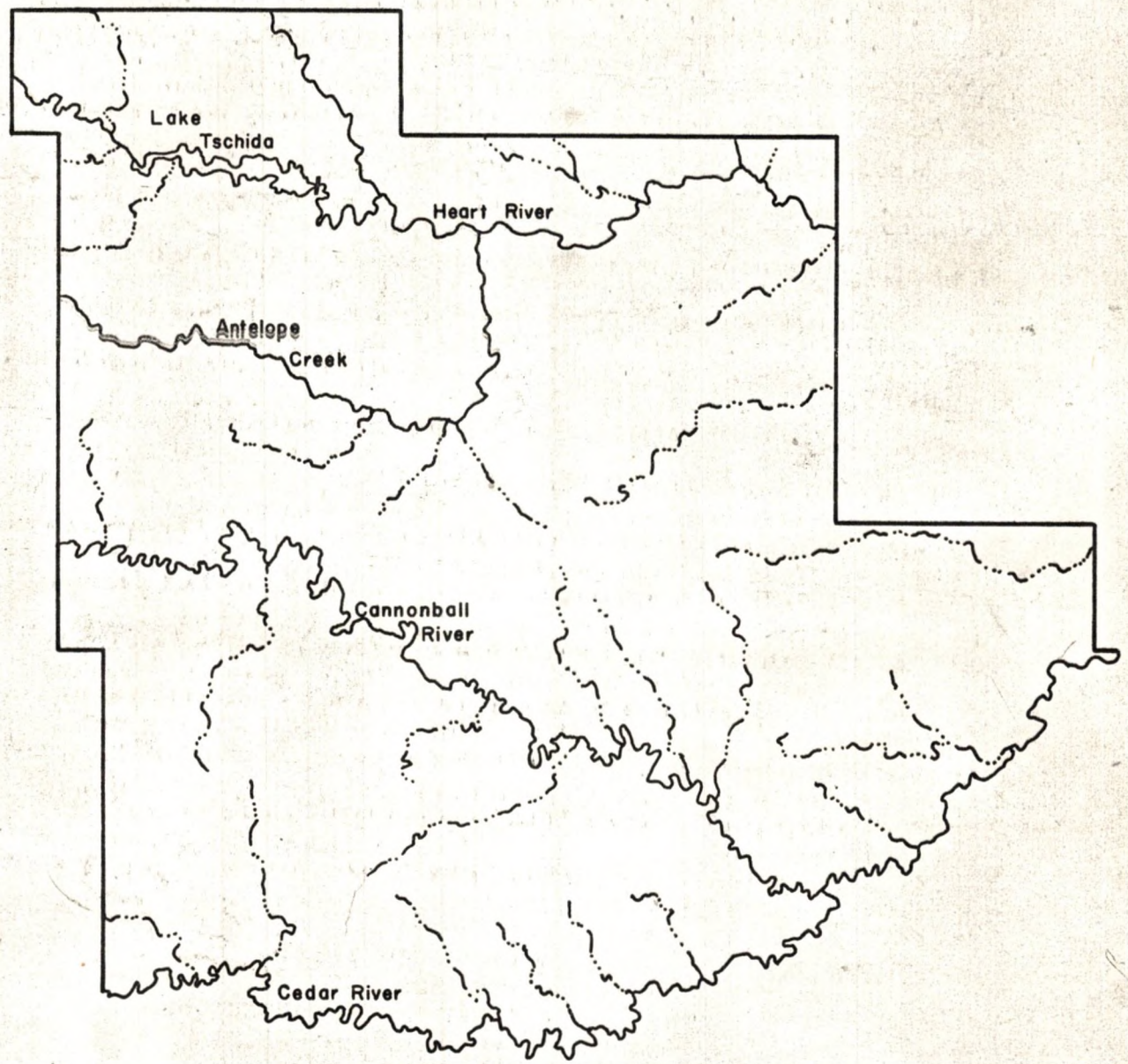
[41] Vernon C. Finch, Glenn T. Trewartha, Arthur H. Robinson, and Edwin H. Hammond, Elements of Physical Geography (New York: McGraw-Hill Book Company, Inc., 1957), p. 141.

GRANT COUNTY
WATER RESOURCES



Scale: 1:500,000

Fig. 13

County until it joins the Cannonball River. The Cedar meanders through the Cannonball Hills land resource area for approximately 70 miles. It is flanked on either side by land ranging from flat grazing and farm land to bare clay buttes which support no vegetation.

The Cannonball River is the largest river of Grant County in terms of length. It is interesting to note that the rivers name was come by quite naturally. Early explorers, buffalo hunters, and military expeditions found round sandstone formations along the river course.[42] These round "cannonballs" varied from several inches in diameter to over 18 inches across. The writer can recall seeing several of these "cannonballs" being used as rock garden decorations in the county. The Cannonball flows through the Cannonball Hills land resource area, lending its name to the area. Spring floods occasionally occur on the river and several proposals to construct a dam on the river in the county have been offered. To date however, there seems to be no evidence that a dam will be constructed on the river in the near future. The Cannonball enters Grant County on the western border and flows southwest to its junction with the Cedar. From the junction the river flows northeast forming a segment of the southern boundary of the county.

The Heart River is the second largest river of the county but may be considered the most important because of the construction of Heart Butte Dam in the western portion of the county. The Heart River meanders through the Heart River Hills land resource area. The Heart flows through areas with extremely steep slopes to areas of level land along the rivers edge which are being developed for irrigation. The river

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[42]Helfinstine and Schaffner, loc. cit., p. 34.

Fig. 14.--Cedar River.

Fig. 15.--Cannonball River.

drains an area of 1,760 square miles, not all of which is Grant County.[43]

Other Water Features

Additional water features in Grant County include Heart Butte Dam, numerous stock ponds, and ground water resources.

Heart Butte Dam

Heart Butte Dam was constructed on the Heart River 15 miles north of Elgin late in 1949.[44] The dam was constructed for irrigation, flood control, recreation, and fish and wildlife preservation. The reservoir created by the dam is known as Lake Tschida and is the largest water body in Grant County. The reservoir area is 11,000 acres with a total capacity of 225,500 acre-feet (equavilent to an acre covered by one foot of water) at an elevation of 2118.2 feet above sea level.[45] Of the reservoirs total capacity, 150,000 acre-feet of water have been designated for flood control and 68,700 acre-feet for irrigation.[46] The dam itself is a rolled earth fill structure rising 124 feet above the streambed with a length of 1,850 feet at the crest.[47] Since it was first put into operation in 1950, Heart Butte Dam has earned flood control benefits estimated at over 5 million dollars.[48]

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[43]U. S. Department of the Interior, Heart Butte Dam, Technical Record of Design and Construction (Washington: Bureau of Reclamation, 1952), p. 1.

[44]Ibid.

[45]Ibid.

[46]U. S. Army Corps of Engineers, Water Resource Development, North Dakota (Omaha: Missouri River U. S. Army Engineer Division, 1963), p. 18.

[47]Ibid.

[48]Ibid.

Fig. 16.--Heart River.

Fig. 17.--Heart Butte Dam and intake structure.

Fig. 18.--Heart Butte Dam and tail race outlet area.

Fig. 19.--Lake Tschida.

Fig. 20.--Private stockpond on the Silty Plains.

Stock Ponds

Another important source of water in Grant County is dams constructed to create stock ponds. Local farmers and ranchers usually construct these on a cost sharing plan with the government whereby the government pays a percentage of the cost of construction because of its importance to water conservation. It is estimated that there are approximately 700 private stock dams in Grant County.[49]

Ground Water

A water resource of the county which should not be overlooked is ground water. In fact, all of the towns and villages of the county obtain their primary water supplies from ground water sources. In Grant

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[49]Interview with Ralph Dietrich, Director, Grant County Soil Conservation Service, July 6, 1966.

County, ground water is located in the residual soils covering the unglaciated area and more abundant supplies are found in the sandstone and lignites of the bedrock formations.[50] Most, if not all, of the farm residents of Grant County obtain their water supply from ground water wells drilled on their property. These wells are also drilled in pastures to provide water for livestock when ponds or other water sources are not available.

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[50]Howard E. Simpson, The Ground Waters of North Dakota (Grand Forks: North Dakota Geological Survey, 1932), p. 15.

CHAPTER II

ECONOMIC GEOGRAPHY OF GRANT COUNTY

Agriculture

The economy of North Dakota is based upon agriculture and the economy of Grant County is dependent upon agriculture to an even greater degree than is the state as a whole. In 1964, for example, Grant County farms occupied 99.7 percent of the 1,064,960 acres of land area in the county.[1]

Employment figures also illustrate the dominant role of agriculture in the counties economy. Of 1794 males employed in the county in 1960, 1295 or 72.1 percent were directly employed in agriculture.[2] This proportion decreases to 66.2 percent when the entire labor force (men, women, and elegible youngsters) is included in the calculations.[3] However, it should be kept in mind that women and children over 14 years of age are generally employed in off the farm occupations for lower wages than the male farm worker generally recieves.

One notable factor, as pointed out in Table 3, is the fact that

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[1]U. S., Bureau of the Census, United States Census of Agriculture: 1964, Grant County, North Dakota (Washington: U. S. Government Printing Office, 1966), p. 2.

[2]N. D., State Outdoor Recreation Agency, North Dakota State Outdoor Recreation Plan, Demographic Data for North Dakota by County (Bismarck: State Outdoor Recreation Agency, 1965), p. 7.

[3]U. S., Bureau of the Census, County and City Data Book, 1962, "A Statistical Abstract Supplement" (Washington: U. S. Government Printing Office, 1963), p. 280.

the number of farms has steadily decreased over the years whereas the average farm size has gradually increased. This trend is generally considered a healthy sign in terms of economical management of larger farm units, however, problems do present themselves regarding the employment and welfare of the people who have left the farm.

TABLE 3

GRANT COUNTY FARM STATISTICS[a]

Item	1954	1959	1964
Land area, acres	1,064,960	1,064,960	1,046,960
Percentage land area in farms	--	99.5	99.7
Number of farms	1,018	961	888
Acres in farms	1,036,498	1,059,874	1,062,050
Average farm size, acres	1,018.2	1,102.9	1,196.0
Value of land and buildings per farm	$22,863	$35,619	$52,795
Value of land and buildings per acre	$21.69	$32.24	$43.82

[a]Calculated from: U. S. Census of Agriculture, Grant County North Dakota: 1964 (Washington: U. S. Government Printing Office), p. 2.

There are 888 farms in Grant County at present, the average size being 1196 acres.[4] Additional figures indicate that the average value of the farm buildings and land has steadily increased from 21 dollars per acre in 1954 to 43 dollars per acre in 1964.[5] It is apparent that the farm of today is more costly to own and operate than was the farm of

[4]U. S., Census of Agriculture, loc. cit.

[5]Ibid.

several years ago.

The most numerous type of farm in Grant County is the livestock farm which accounts for 381 of the 888 total farms. A livestock farm is one which recieves 50 percent or more of its income from sales of livestock or livestock products (cattle, calves, hogs, sheep, wool, and/or mohair). Exclusions to this include dairy products, poultry, and poultry products.[6] Cash-grain farms are second in numbers in the county with a total of 134 farms. A cash-grain farm is one that derives 50 percent or more of its income from corn, sorghum, small grains, and field vegetables. In descending order, the remaining farm types in the county are general farms, numbering 134 (cash income from three or more sources); 77 dairy farms, 45 miscellaneous or unclassified farms, (nursery farms, horse or colt farms, and institutional or Indian reservation farms); and 2 poultry farms.[7] These facts are further illustrated in figures pertaining to the value of farm products sold. Of the 7 million dollars worth of county farm products in 1964, livestock and livestock products including dairy and poultry products accounted for nearly four and one half million dollars and all crops accounted for about two and one half million dollars.[8]

The average Grant County farm sold 8,209 dollars worth of products in 1964 and the majority of the county farms are classified as commercial (5,000 to 9,999 dollars worth of farm products sold annually).[9]

Livestock

It has already been noted that the most popular type of farm in

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[6]Ibid.

[7]Ibid.

[8]Ibid.

[9]Ibid.

Grant County is the livestock farm. Grant County livestock farms are basically diversified farms. While they account for 50 percent or more of their gross sales from livestock of one or more types, corn and/or feed grains generally make up a portion of the farms products. These may or may not be consumed entirely by the livestock on the farm. In fact, it is the contention of the author that the majority of farms classified as livestock farms, do in fact participate to some extent in cash-cropping practices.

Cattle

Beef cattle are the predominant livestock type of Grant County. In 1965, Grant County accounted for 62,000 head of cattle, 7,800 of which were milk cows.[10] Thus, some 54,200 cattle were classified as non-dairy animals. This would logically include calves and dairy bulls, but it is readily discernable that the greater portion of the counties cattle population is composed of beef cattle. In the county, as in the state as a whole, the leading beef cattle breeds are Angus, Hereford, and Shorthorn.[11] One of the predominant breeds of beef cattle in the county is the Aberdeen Angus breed. Dairy cattle run a poor second to beef cattle in total production but dairy cattle and dairy products have a definite role in the county economy. A cheese plant recently began operations in Selfridge, North Dakota which is located to the south east in Sioux County. This plant now offers bulk milk pick-up service to Grant County producers. The company places a bulk milk cooler on the farm and a

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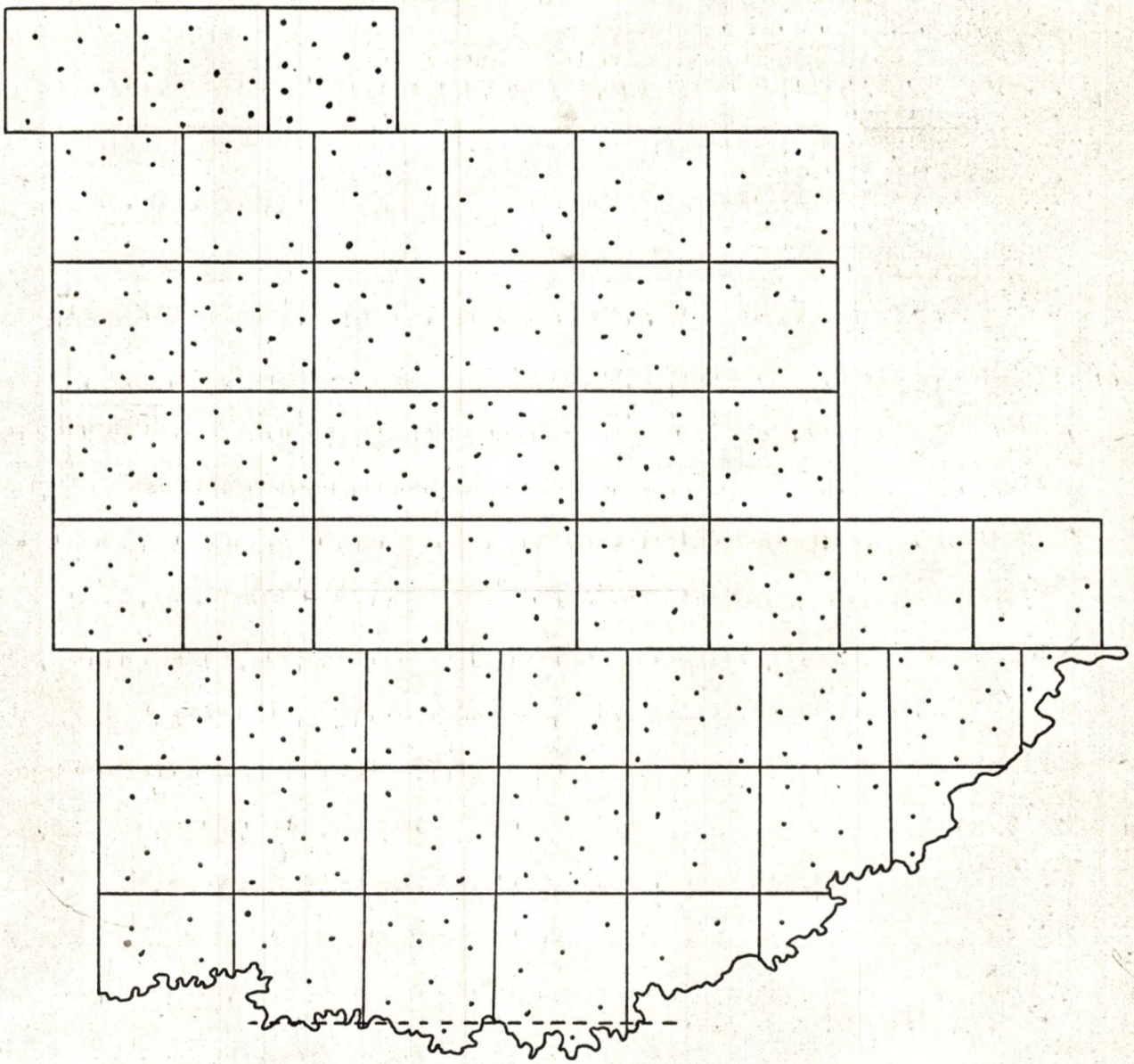
[10]N. D., Crop and Livestock Reporting Service, North Dakota Crop and Livestock Statistics (Fargo: North Dakota Crop and Livestock Reporting Service, 1965), p. 32.

[11]Bernt L. Wills, North Dakota, The Northern Prairie State (Ann Arbor, Michigan: Edwards Brothers, Inc. 1963), p. 171.

GRANT COUNTY
CATTLE



One Dot = 50 Head

Scale 1:500,000

Fig. 21

Fig. 22.--Small Holstein dairy herd.

certain amount is withheld from each milk check until the cooler is paid for and becomes the property of the farmer. Thus, much of the county milk production is now marketed as whole milk rather than separated cream. In 1964, 68 farms sold 7,780,691 pounds of whole milk. Also in 1964, 32,026 head of cattle and calves were marketed from county farms.[12]

Figure 21 illustrates the distribution of all types of cattle in Grant County. It will be noted that the distribution is quite uniform with the northern Silty Plains area possessing a slight increase in comparison to the remainder of the county.

Hogs

Hogs are second to cattle in total numbers but are greater in

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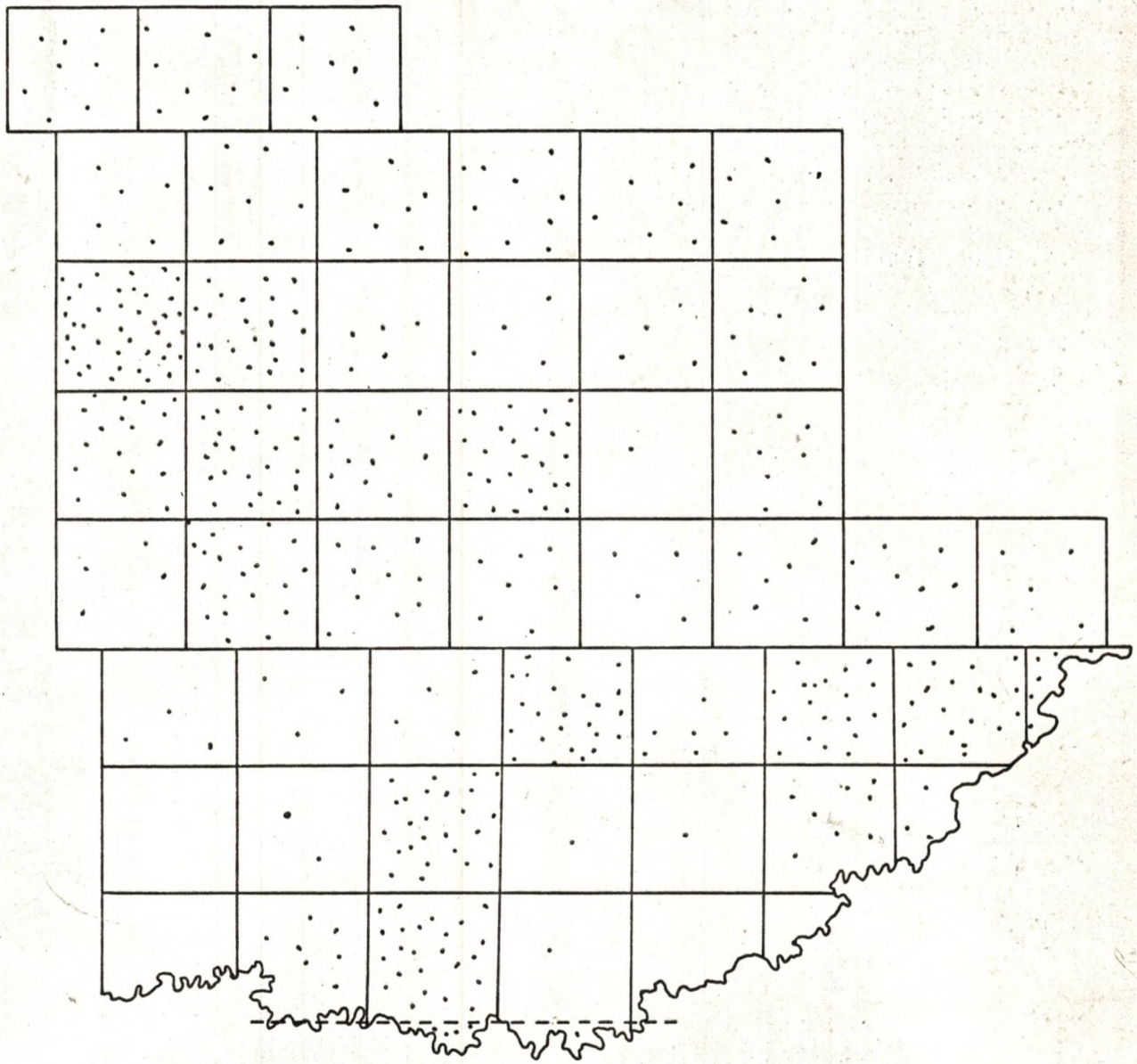
[12]U. S., Census of Agriculture, loc. cit., p. 4.

GRANT COUNTY
HOGS



One Dot = 5 Hogs

Scale 1:500,000

Fig. 23

numbers than dairy cattle. In 1965 Grant County had 10,000 hogs, an increase of 500 over the preceeding year.[13] Figure 23 shows the distribution of hogs in Grant County. Again, the northern Silty Plains lead in hog production with the south central and south east areas of the county also being important producers.

Sheep

Sheep are generally found throughout the county, but there are several townships which report no sheep at all. Sheep numbers, unlike hogs, decreased by approximately 2,000 head from 8,500 in 1964 to 6,500 in 1965.[14] It will be noted from the distribution map of sheep that the distribution is quite uneven. Most of the sheep are located in the rougher land areas where soils are generally of lower quality than those areas where sheep are not located.

Chickens

Chicken numbers decreased only slightly from 1964 to 1965. The present number of chickens in the county is approximately 43,000.[15] Since the price the producer recieves for his eggs is quite low, the number of chickens may continue to decline if egg prices do not increase.

Horses

Horses are quite well distributed throughout the county. In 1965 Grant County had 1,197 head of horses of all types. Horses in the county

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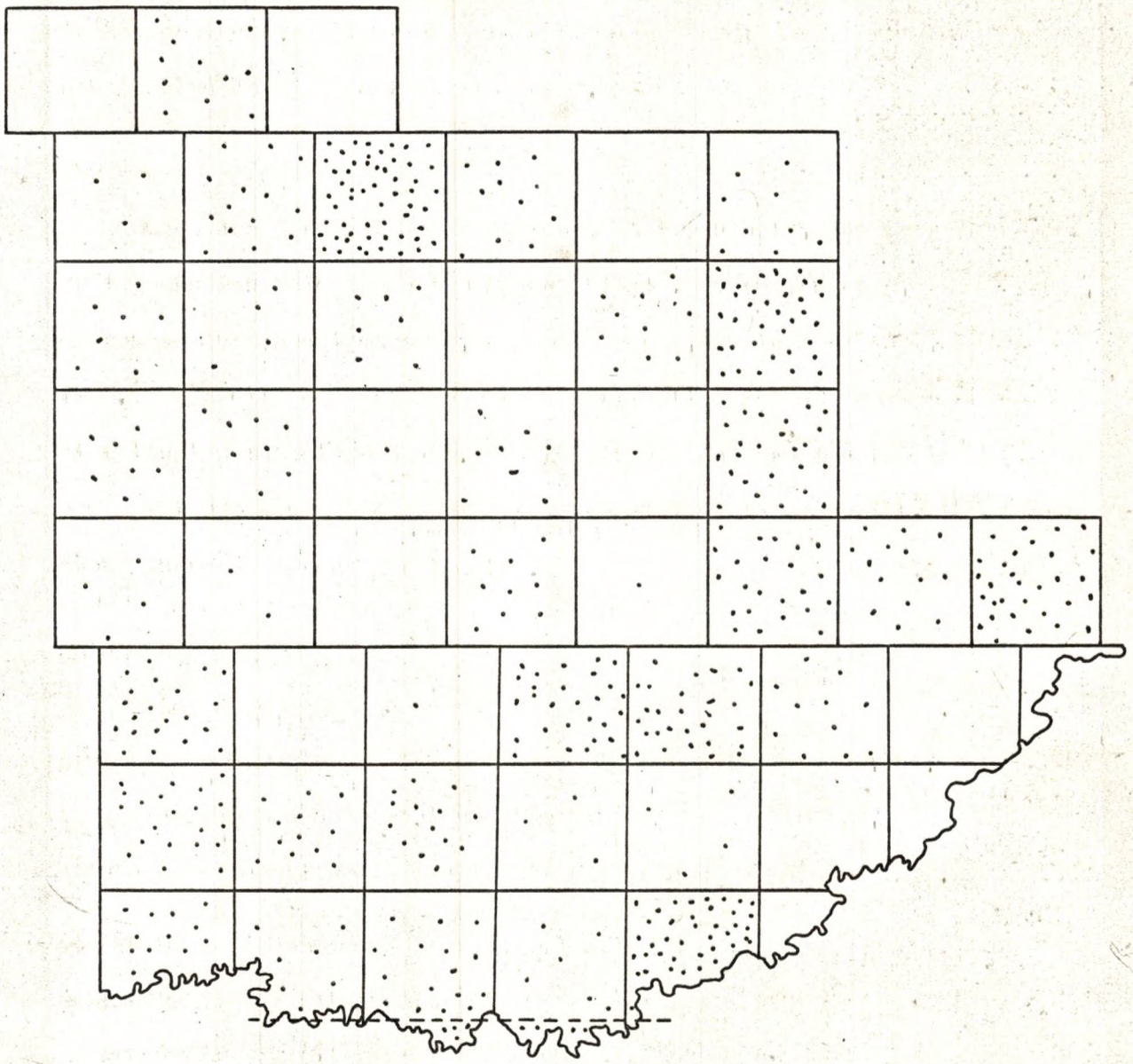
[13]N. D., Crop and Livestock Statistics, loc. cit.

[14]Ibid.

[15]Ibid.

[16]Personal interview with Mr. Oscar Heupel, Grant County Auditor, July 7, 1966.

GRANT COUNTY
SHEEP



One Dot = 10 Sheep

Scale 1:500,000

Fig. 24

are principally riding horses but there are still teams of work horses which are used on occasion. Some of the counties horses are raised as roedeo stock and are sold or used in rodeos throughout the area.

As previously noted, the livestock of Grant County account for approximately two-thirds of the value of all farm products sold. Livestock play an important role in the economy of the county, not only on livestock farms, but also on farms of other types which draw less than 50 percent of their product sales from livestock. The milk cow or two, several hogs, and a flock of chickens keep many of the farm families of the county in fresh milk, meat, and eggs which would otherwise be purchased at a considerably higher cost if the individual farmer did not take the time and effort to maintain the animals.

Crops

Crops make up over one-third of the value of all agricultural products sold in Grant County. Table 4 indicates the acreage devoted to the major crop types of Grant County and also indicates the average yield of these crops for 1964. It will be noted that the crops of Grant County exhibit a variety typical of an area dependent upon cash-cropping as well as upon the feed grains for livestock consumption and production.

Wheat is the dominant crop of Grant County; it is found to some degree in all areas of the county, but concentrations are found on the Silty Plains and Sandy Lands (Fig. 26). The majority of the wheat found in the county is spring wheat. Average wheat yields in Grant County are among the lowest in the state. Averages in 1964 were about 16 bushels per acre while the state average was near 24 bushels per acre.[17] Winter

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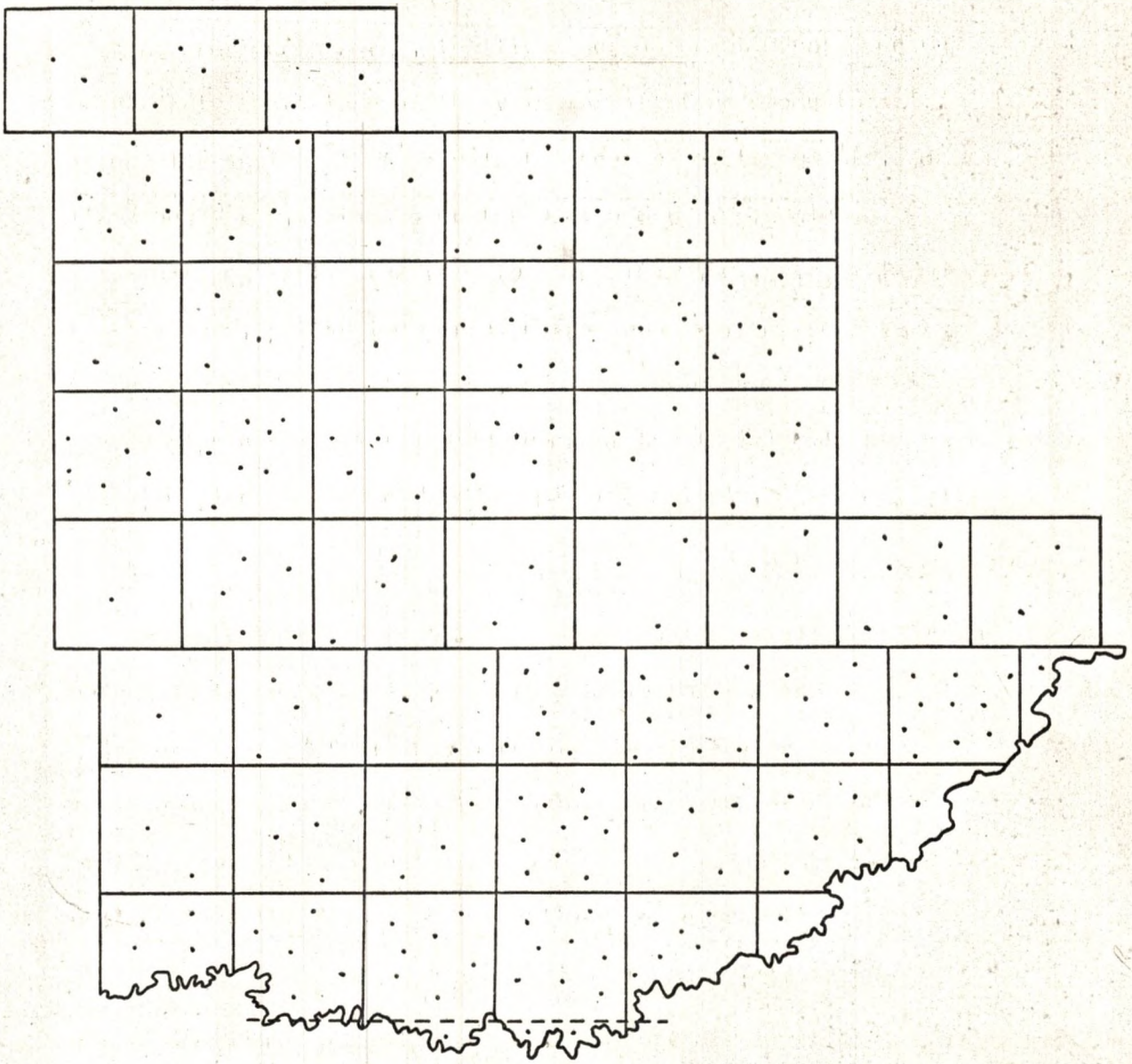
[17]Ibid. p. 10.

GRANT COUNTY
HORSES



One Dot = 5 Horses

Scale 1:500,000

Fig. 25

TABLE 4

CROPS OF GRANT COUNTY, 1964[a]

Crop	Farms Reporting Acreage	Acreage Reported	Yield
All wheat	775	108,201	16.1 bu./ac.
Spring wheat	773	107,811	9.1 bu./ac.
Oats	689	39,347	38.0 bu./ac.
Corn (for all purposes)	544	36,500	--
Barley	381	16,006	26.0 bu./ac.
Rye	106	6,568	20.0 bu./ac.
Flax	87	3,585	8.5 bu./ac.
Corn (for grain)	40	2,200	15.0 bu./ac.
Millet	10	108	10.4 bu./ac.
Durum wheat	9	515	22.0 bu./ac.
Safflower	6	139	423.3 lbs./ac.
Winter wheat	3	390	9.1 bu./ac.

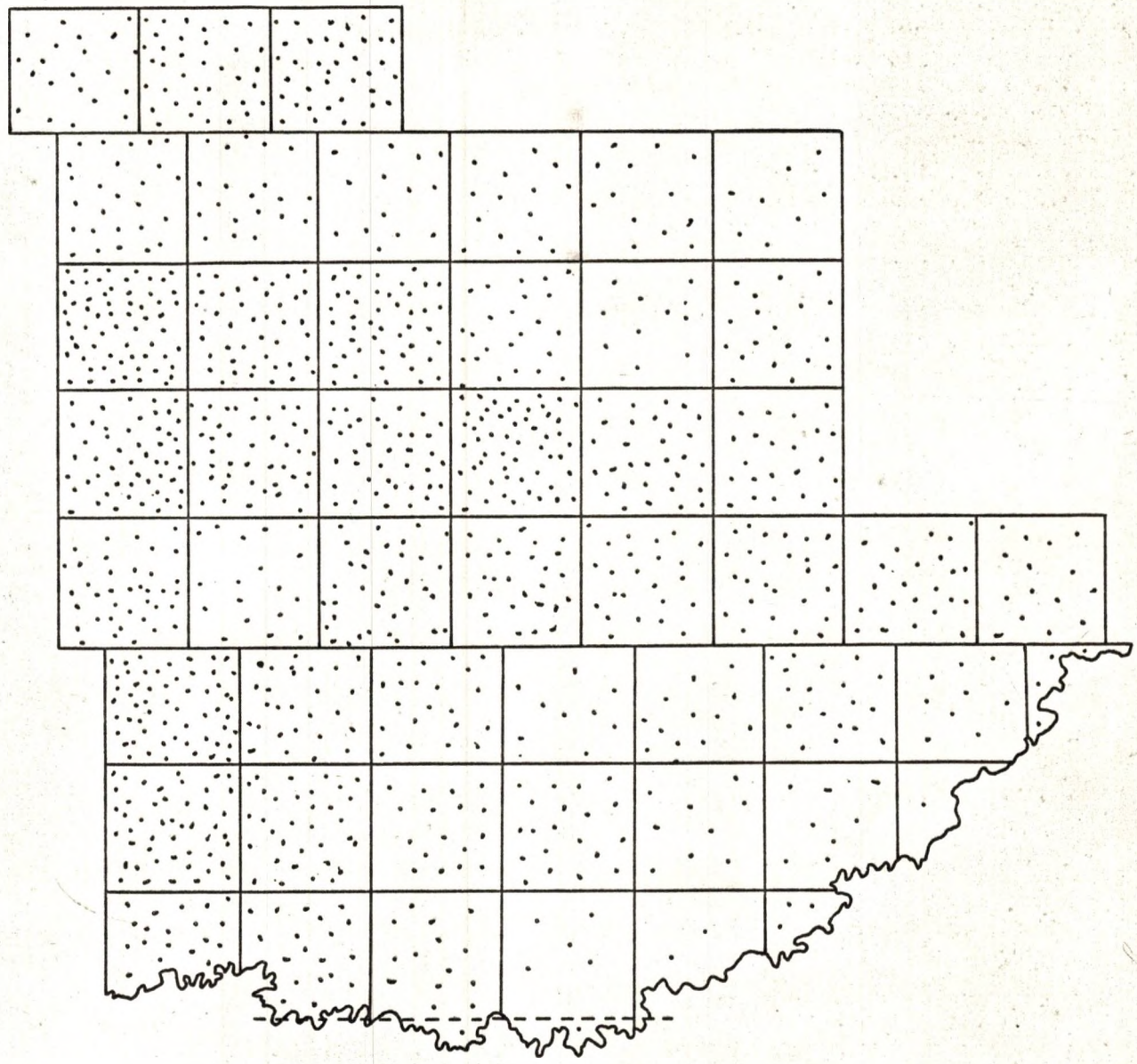
[a]Calculated from: U. S. Census of Agriculture, Grant County North Dakota: 1964 (Washington: U. S. Government Printing Office), and North Dakota, Crop and Livestock Statistics (Fargo: North Dakota Crop and Livestock Reporting Service, 1965).

wheat and durum wheat are also grown in the county but only 12 farms reported 905 acres of these two types together. Wheat accounts for three times the acreage of the next largest crop, oats.

Oats occupies over 39 thousand acres and average yields of about 38 bushels per acre are near the state average of 40 bushels per acre recieved in 1964.[18] Unlike wheat, oats and barley are not grown as a

[18]Ibid. p. 20.

GRANT COUNTY
WHEAT



One Dot = 100 Acres

Scale 1:500,000

Fig. 26

cash crop to the extent that wheat is. Ground oats and pelleted barley are popular livestock feeds and much of the countys oats and barley production is directly consumed on the farm unit on which it was grown. Barley acreage in the county amounts to 16 thousand acres and average yields are 26 bushels per acre as compared with a statewide average of 33.5 bushels per acre.[19] County corn acreage amounts to over 36 thousand acres, 2,200 of which are classified as corn for grain purposes.[20] Corn is used mainly as a livestock feed with large amounts being chopped and converted to silage and some being picked and fed to livestock as is. Additional crops of consequence found in the county are rye, safflower, and millet. Table 4 indicates the particulars on the remaining crops of Grant County. Hay is an important crop in Grant County due to the dependence of the area upon the livestock economy. In 1964 Grant County accounted for 101,000 acres of hay at an average of 1.19 tons per acre for a total production of 120,300 tons.[21] This included alfalfa hay, other tame hays, and wild hay that was cut for livestock feed.

Additional factors which should be noted in an agricultural economy that is crop oriented is the degree of mechanization of the area and the extent of approved conservation practices carried out by the farmers of the county. The farms of Grant County are well mechanized as illustrated by numbers of mechanical equipment in the county. Grant County has 869 farms with one or more tractors and a total of 2,301 tractors, an average of 2.5 tractors per farm. The distribution of tractors in the county is shown in Figure 27.[22] Additional statistics indicate

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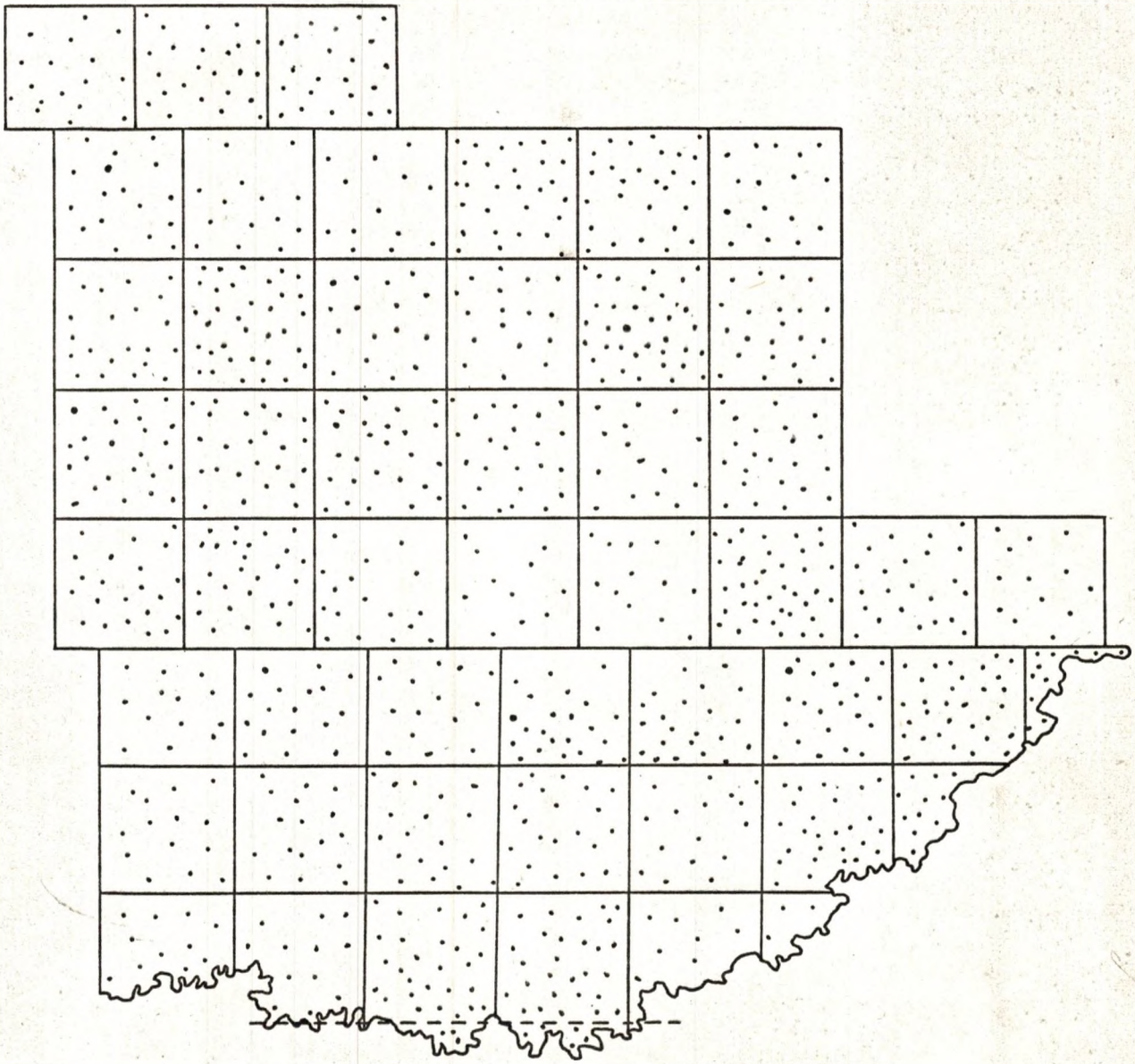
[19]Ibid. p. 18.

[20]Ibid. p. 9.

[21]Ibid. p. 27.

[22]U. S., Census of Agriculture, loc. cit., p. 3.

GRANT COUNTY
TRACTORS



One Dot = 5 Tractors

Scale 1:500,000

Fig. 27

that 631 farms have 690 combines and 848 farms account for 1372 trucks and pickups.[23] Additional figures, plus knowledge of the author, confirm the fact that Grant County is adequately supplied with modern mechanized equipment to meet the demands of county agriculture.

Figures relating to conservation practices in Grant County indicate that approximately 4,000 acres are classified as irrigated farmland.[24] Of this amount, 2,400 acres are located in the bottom lands of the Heart River (Fig. 16, p. 32); 600 acres on the Cannonball River; and approximately 1,000 acres of waterspreading or flooding from an available stream are carried on at various locations throughout the county. Furthermore, 240,000 acres of county farmland are devoted to strip cropping practices and 25,000 acres are in contour farming. Farmstead and feedlot windbreaks account for 2,000 acres and there are 250,000 feet of field windbreaks in the county. While these figures do not account for a majority of the possible areas of conservation, it is worthy of note that steps in this direction are being taken and that the role of conservation is being stressed.

Mineral Resources

Some of the mineral deposits of Grant County are of considerable extent, but very little economic return is derived by the county from mineral resources. In 1960, 11 people in Grant County were employed in mining.[25] This stresses the fact that minerals have little bearing

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[23]Ibid.

[24]Interview with Ralph Dietrich, Director, Grant County Soil Conservation Service, July 6, 1966.

[25]N. D., North Dakota State Outdoor Recreation Plan, Demographic Data for North Dakota by County, loc. cit., p. 7.

on the overall economy of the county.

Lignite

Lignite coal deposits of over four feet in thickness are located in the western half of Grant County and deposits of less thickness are located in various other locations through the county.[26] At one time Grant County had 16 lignite mines in various stages of operation, but this number has since been reduced with the closure of some of the coal mines.[27] Some of the mines were underground mines, but today only a few of the strip mines remain. The largest mines in the county are the Davenport Mine located one mile north-west of New Liepzig and the Coffin Butte Mine located 11 miles south of New Liepizg. Facilities of the Davenport Mine are shown in Figures 28 and 29. Lignite is of little importance to the county today but the potential for future use of the resource is great. A part of this potential is indicated by the construction of lignite generators at locations throughout western North Dakota.

Additional Mineral Resources

Further mineral resources of Grant County include sand and gravel, sandstone, quartzite, scoria, and possible oil reserves.[28] Sand and gravel materials are found in the outwash areas of glacial features (Fig. 2, p. 15). Deposits are generally thin, patchy, and not of high quality. The material is suitable for road graveling and general purpose construction

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[26]Wills, loc. cit., p. 207.

[27]Adeylnn M. Magnusson, North Dakota Lignite Analyses (Grand Forks: College of Engineering, University of North Dakota, 1960).

[28]N. D., Economic Development Commission, Here is the New North Dakota (Bismarck: North Dakota Economic Development Commission, 1966), p. 11.

Fig. 28.--Strip mining operations at the Davenport Mine.

Fig. 29.--Loading and weighing facilities at Davenport Mine.

Fig. 30.--Worked out gravel pit near New Liepzig, N. D.

work but not suitable for high quality construction work unless it is washed and sorted. Figure 30 shows a gravel pit which has been worked out; it is located south of New Liepzig, one mile north of the Cannonball River. Grant County also has sandstone suitable for concrete aggregate, riprap, and building purposes. Quartzite suitable for building purposes and riprap is also located within the county and scattered deposits of scoria are found throughout the county. Scoria has no major utilization but is often used as a gravel for private roads and driveways.

Since Grant County lies within the Williston Basin, the possibilities for oil have not been overlooked. Several test wells have been drilled throughout the county and plans are scheduled for the drilling of three more test wells in the Cannonball River area of Grant and Sioux Counties.[29]

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[29]The Carson Press, June 22, 1966.

Thus far however, oil has not been located in Grant County but several wildcat wells in nearby counties have recorded minor "shows" of oil on occasion.

Business Economy

Remaining facets of the Grant County economy include the salaried workers and various business establishments which cater to the agricultural population of the county. Table 5 indicates the number of employees in specific occupations outside the agricultural and mining occupations.

TABLE 5

NUMBER OF EMPLOYEES IN SPECIFIED OCCUPATIONS, 1962[a]

Occupation	Number of Employees
Wholesale and retail trade	243
Public administration	109
Education	108
Transportation, communication, and public utilities	68
Construction	52
Finance, insurance, and real estate	30
Manufacturing	10
Entertainment and recreation services	4

[a]Calculated from: U. S. Bureau of the Census, County and City Data Book, 1962 (Washington: U. S. Government Printing Office, 1963), p. 274.

Trade establishments lead the list of employees. Public administration and education share a position of equality in numbers of employees. Remaining occupations are of comparatively minor consequence in the total

TABLE 6

TRADE AND SERVICE INDUSTRY ESTABLISHMENTS, 1963[a]

Business Type	Number of Establishments	Sales
Retail Trade		
Lumber, hardware, and farm equipment dealers	7	
General merchandise	2	
Food stores	7	
Automotive dealers	4	
Gasoline service stations	3	
Eating and drinking places	14	
Drug stores	2	
Nonstore retailers	2	
Total retail trade	41	$3,328,000
Wholesale Trade		
Merchant wholesalers	2	
Other operating types	18	
Total wholesale trade	20	$3,362,000
Selected Services		
Hotels and motels	3	
Personal services	5	
Miscellaneous repair services	9	
Amusement and recreation services	1	
Total selected services	18	$117,000

[a]Calculated from: U. S., Department of Commerce, Bureau of the Census, 1963 Census of Business (Washington: U. S. Government Printing Office, 1965).

economy of Grant County. Table 6 lists the type of establishments that make up the trade and service economy of the county and the total sales of each for 1963. Previously unmentioned white collar professions account for 17.0 percent of the civilian labor force.[30] This includes people engaged in professional services, managerical positions, and clerical and sales work.

Another indication of the economy of Grant County may be found in the area income figures for 1960. The median income for county families in 1960 was 3,177 dollars with 47.2 percent of the families earning less than 3,000 dollars annually and 5.9 percent of the counties families recieving over 10,000 dollars of average annual income.[31]

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[30] U. S., County and City Data Book, loc. cit., p. 274.

[31] Ibid. p. 273.

CHAPTER III

CULTURAL GEOGRAPHY OF GRANT COUNTY

History

The area presently known as Grant County became a portion of the United States with the Louisiana Purchase of 1803.[1] The area including Grant County experienced a number of name changes from 1803 to 1916. In 1804 the area was redesignated the District of Louisiana but this was again changed in 1805 to Louisiana Territory.[2] In 1812 the name of the area was changed to Missouri Territory, remaining as such until 1834 when it was re-named Indian County. In 1854, the area was included in the Nebraska Territory and held that designation until March 2, 1861, when President Buchanan signed the bill which created Dakota Territory.

The laws of the Legislative Assembly of 1872-73 provided that most of the area of North Dakota be divided into counties. At that time the northern portion of present day Grant County was organized as Morton County and the southern portion was organized as Boreman County. Boreman County extended into present day South Dakota. The Legislative Assembly of 1879 provided for several changes in county boundaries, among them a change in the Morton County boundary. Morton County was established to include all of present day Grant and Morton Counties. Boreman County

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[1] O. G. Libby, Editor, Collections of the State Historical Society (Grand Forks, Normanden Publishing Co., 1923) Vol. V, p. 170.

[2] Additional facts on Grant County history taken from the same source as footnote 1.

became the Big Sioux Reservation, which later became a part of the Standing Rock Indian Reservation of North and South Dakota. Thus, present Grant County was still organized as Morton County when on November 2, 1889, President Harrison proclaimed North Dakota a state of the Union. At the time North Dakota became a state, there were 53 counties, the same number as there are today. However, after 1889, there were considerable changes in the county structure and the numbers fluctuated until 1916 when Grant County became the 53rd and last county to be created in North Dakota. Grant County was separated from Morton at the general election held on November 7, 1916. At the election, 3,136 votes were cast in favor of the separation and 1,718 against it. Grant County was formally organized on November 25, 1916.

Early settlement

The Grant County area was first opened to white settlement in 1859 by the federal government. Cattlemen were the first to arrive and settle in the area but their dominance was short lived as homesteaders began to invade the prairie after the passage of the Homestead Act of 1862. However, it was not until the late 1800's that people came in numbers.[3] Shortly after the turn of the century, towns were established to meet the needs of the homesteaders. Previously, goods and services were obtained from towns along the main route of the Northern Pacific Railroad, some 30 miles north of central Grant County.

In 1910, two railroads came into Grant County. The Northern Pacific built a line from Mandan through Grant County and the Chicago, Milwaukee, St. Paul and Pacific constructed a line from Mobridge, South Dakota,

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[3]All data relating to county settlement taken from 50th Anniversary Books of Carson and Elgin, North Dakota; printed in 1960 (no longer published).

through the county, to New England, North Dakota.

Following the advent of the railroad, towns sprang up along the route and business men began to serve the needs of the new communities. At one time there were in excess of 25 villages in Grant County. However, over half of these were rural post-offices and several were railroad stations which never achieved the status of a town. Over the years these village sites have been removed and only the larger towns remain. Thus, settlement of Grant County began on a small scale after 1859 and increased by the turn of the century with the greatest population increase coming with the railroads in 1910.

In 1916, the county commissioners selected Carson as the temporary county seat and at the election of 1918, Carson was selected as the permanent county seat. Since 1918 there have been no significant changes in the history of Grant County. The county, along with the state and nation, experienced the depression of the 1930's and has had a number of good and bad years since.

Population

The population of Grant County increased from a total of 9,553 in 1920 to a high of 10,134 in 1930. Since the 1930 census, the population of Grant County has gradually decreased to an estimated 5,800 in 1965 (Fig. 31).[4]

The 1960 census accounted for 6,248 people in the county.[5] Of these

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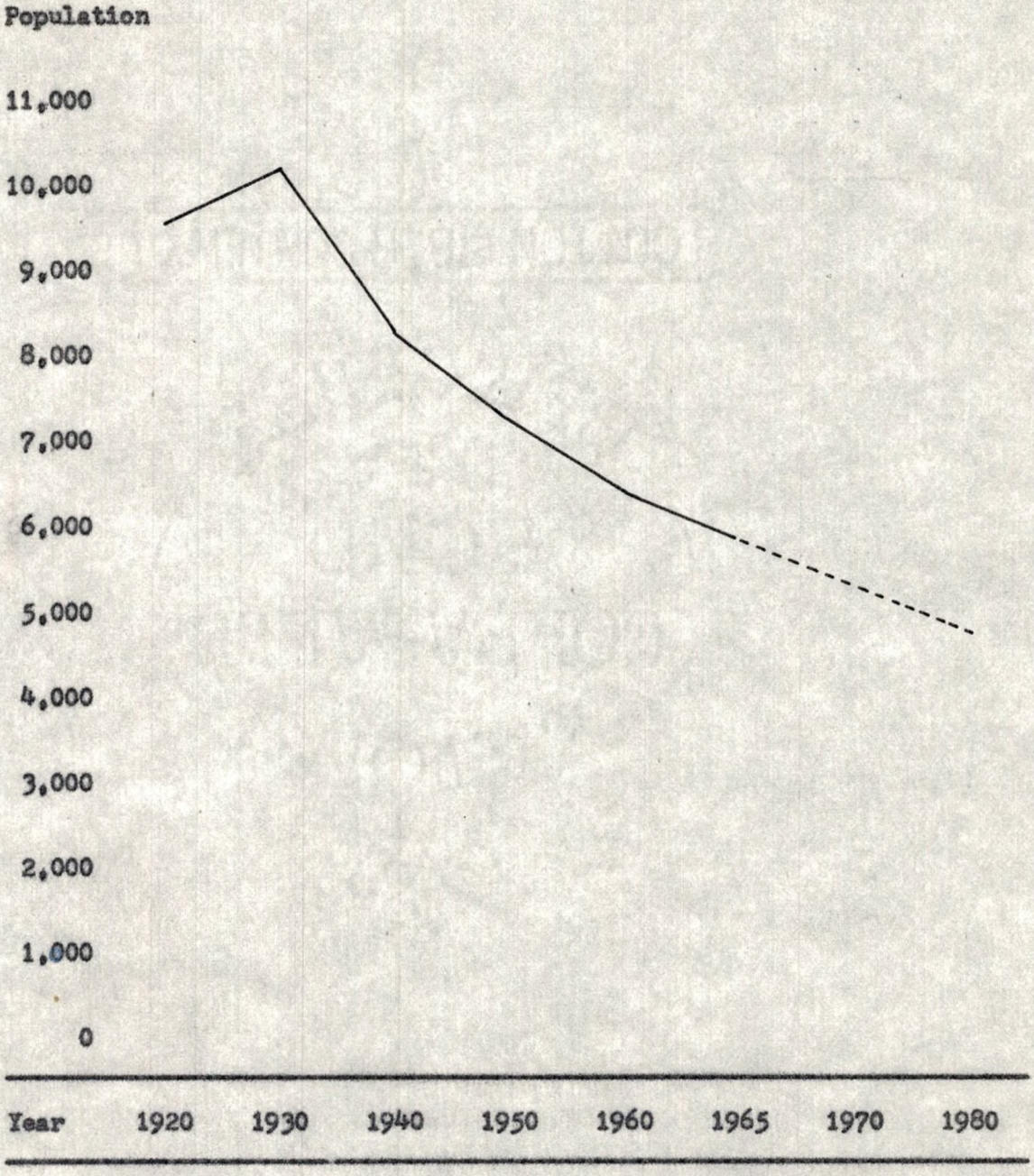
[4]N. D., Economic Development Commission, North Dakota Growth Indicators, 1966-67 (Bismarck: North Dakota Economic Development Commission, 1966) p. 9.

[5]Remaining facts on Grant County Population taken from: North Dakota State Outdoor Recreation Plan, Demographic Data for North Dakota by County (Bismarck: State Outdoor Recreation Agency, 1965).

Fig. 31

GRANT COUNTY POPULATION TRENDS[a]



[a]N. D., Economic Development Commission, North Dakota Growth Indicators, 1966-67 (Bismarck: North Dakota Economic Development Commission, 1966).

3298 were males and 2950 were females, a ratio of 1.12 to 1.0. The 1960 census indicated that there were 1591 households in the county with an average size of 3.91 persons per household.

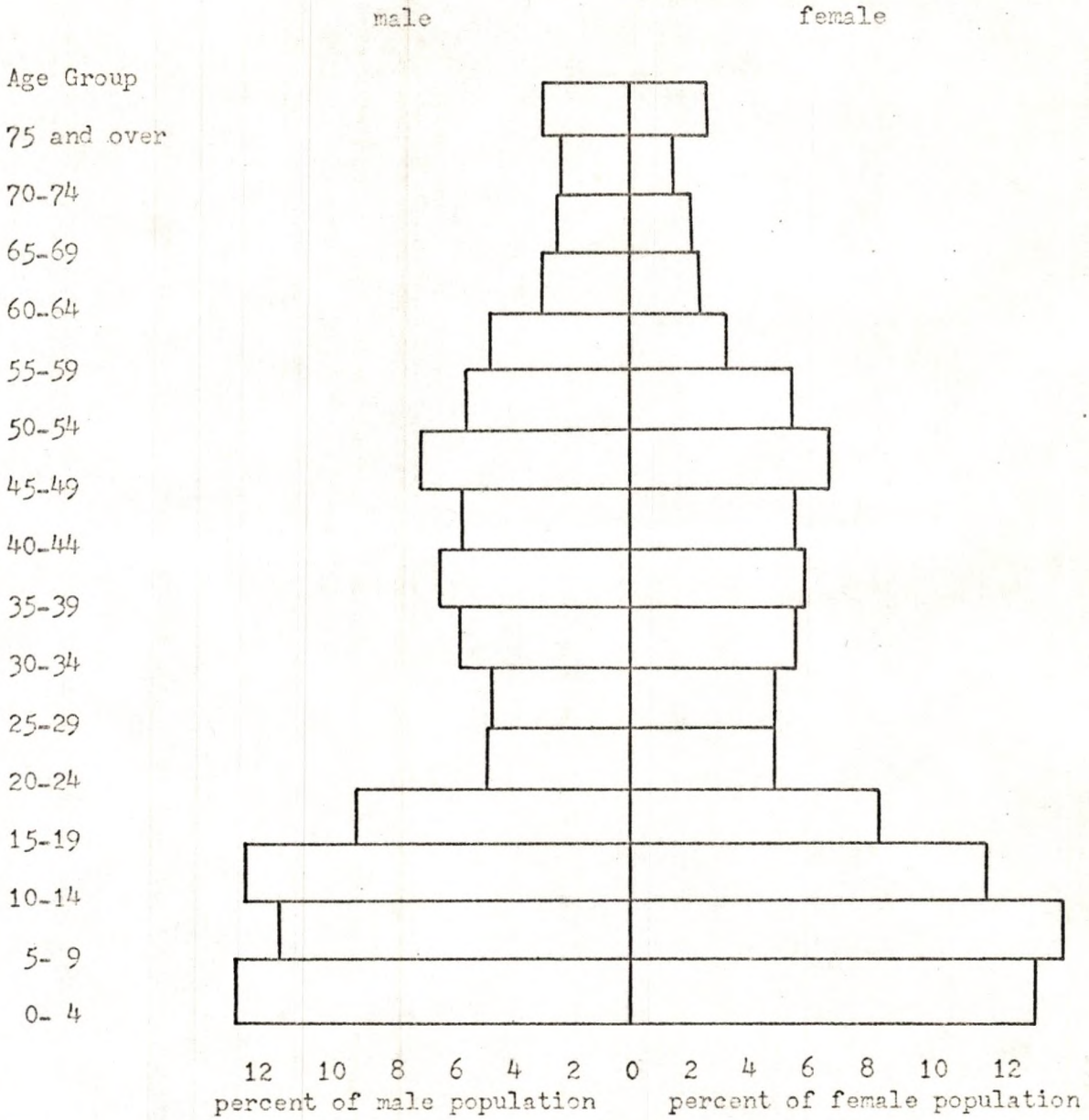
The entire population of the county is classified as rural since no town records a population of over 1,000 people. Of the total population, 4142 are classified as rural farm population and 2106 are classified as rural non-farm population. In 1960 there were only 14 people in the county classified as non-white. These are, primarily, of Indian descent. Figure 31 illustrates the age-sex pyramid for Grant County. It will be noted that the largest age group of males is under 5 years, whereas the smallest age group is 70 to 74 years. The largest age group of females is 5 to 9 years while the smallest age group is again the 70 to 74 years group. The median age of all males is 24.1 years, whereas the median age group for the females is 23.2 years.

Today Grant County has 11 towns serving commercial purposes. They range from a cattle shipping point at Brisbane to the center of county government at Carson (Fig. 34). The villages of Pretty Rock and Paradise no longer exist (Fig. 33). These two villages were rural post-offices in the early days of the county. The largest town of the county is Elgin with a population of 944. Elgin is followed by Carson, population 501; New Liepzig, population 390 and Leith, with a population of 100. The remaining towns of the county all have fewer than 100 people.

Population projections for Grant County indicate a continued decline of population over the next 15 years (Fig. 31). Grant County had an out-migration rate of 13 percent between 1960 and 1965 (a total of 867 people left the county). Most of these people are leaving the county because of lack of available employment within the county and because of a promise of greater economic opportunity elsewhere.

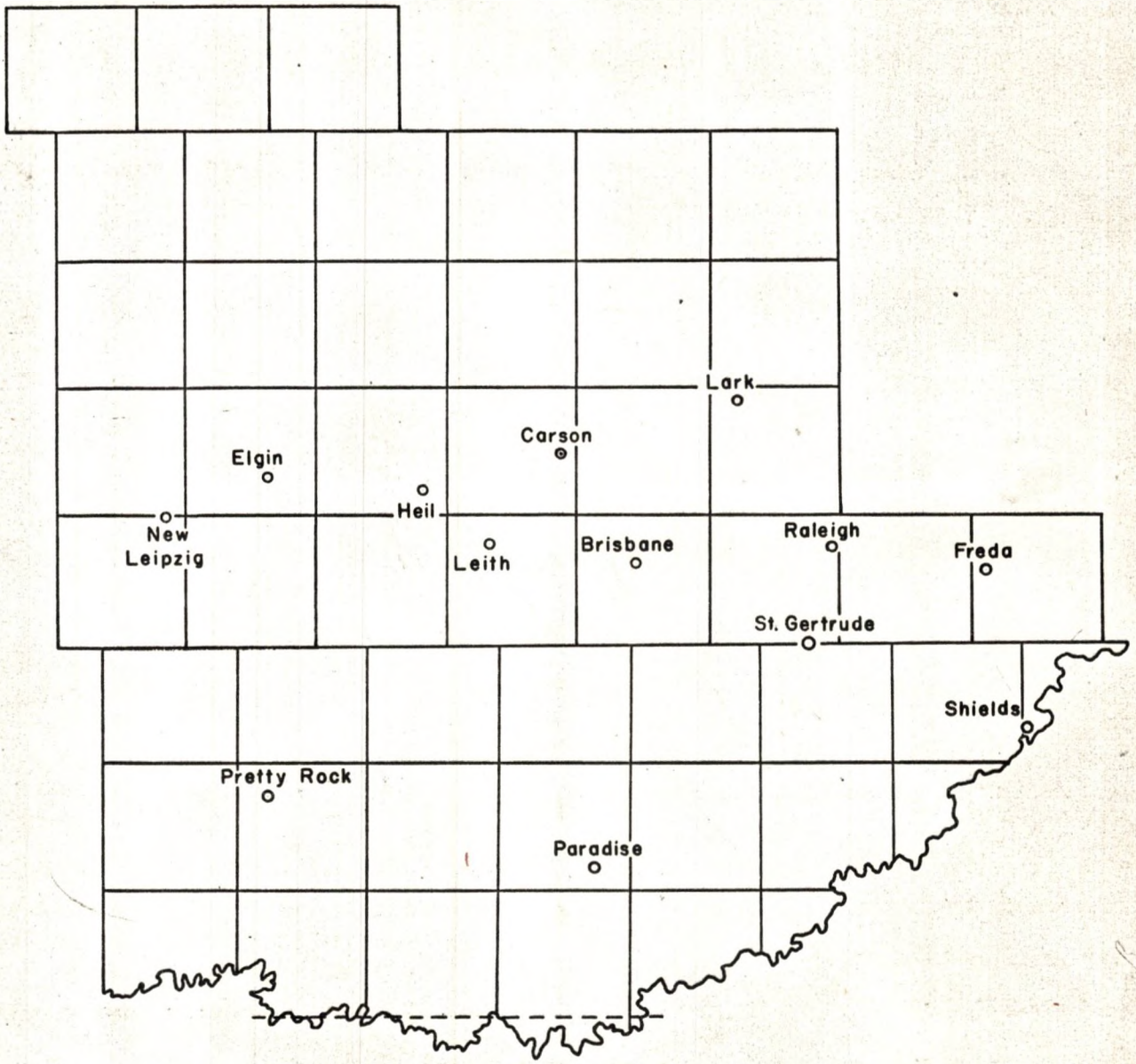
Fig. 32

GRANT COUNTY: AGE-SEX PYRAMID, 1960[a]



[a]Data calculated from: N. D., State Outdoor Recreation Agency, North Dakota State Outdoor Recreation Plan, Demographic Data for North Dakota by County (Bismarck: State Outdoor Recreation Agency, 1965).

GRANT COUNTY
TOWNS AND VILLAGES



Scale: 1:500,000

Fig. 33

Fig. 34.--Carson, N. D. : County Seat of Grant County.

Government

The governmental functions of Grant County are administrated from the county court house in Carson (Fig. 35). The county offices consist of a county auditor, a states attorney, a clerk of court, a county judge, a sheriff, a county treasurer, a register of deeds, a county superintendent of schools, a county coroner, and three county commissioners. County commissioners are elected by 4 year terms and the remainder of the county officials serve 2 year terms.[6]

Grant County also has 21 organized townships. The unorganized townships are under the jurisdiction of the county commissioners. The organized townships of Grant County include all of those named in figure 36, with the exception of Carl, Carson, Valley View, Janesburg, and Cannonball

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[6] N. D., Economic Development Commission, Here is the New North Dakota (Bismarck: North Dakota Economic Development Commission, 1966) p. 72.

Fig. 35.--Grant County Court House.

Townships. Those which are not named are also unorganized.[7]

Transportation

Grant County has a good transportation system with ready access to highway, railroad, and air transportation service.

Portions of three state highways pass through the county; North Dakota 21, 49, and 31. Highway 21 provides the major east-west transportation artery across the county while N. D. 49 is the major north-south highway of the county. Of the three state highways, only N. D. 21 is entirely paved. There are approximately 70 miles of paved state highway in Grant County and about 33 miles of gravel state highway.[8] The county has a fairly good network of county highways, nearly all of which

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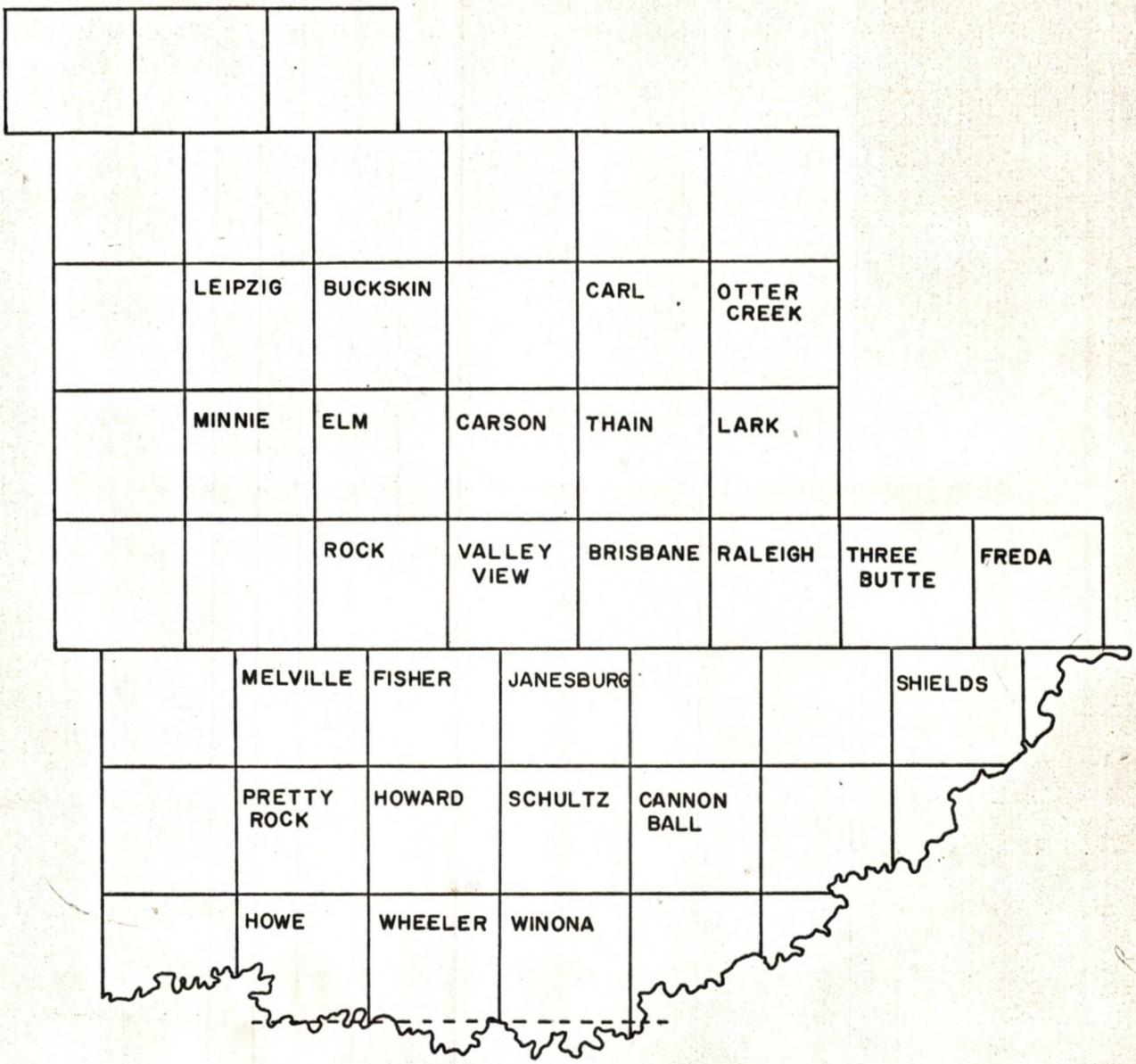
[7]Interview with the Grant County Auditor, July 7, 1966.

[8]Grant County Highway Map, 1962.

GRANT COUNTY
TOWNSHIPS



Scale 1:500,000

Fig. 36

are graded and graveled. The county is served by one bus line which provides daily service on highway 21. There are also several private trucking concerns in the county which provide delivery and marketing service on such items as cream, sand and gravel, and livestock.

The county is also served by two rail lines. The Northern Pacific and the Milwaukee Road offer rail service to all of the present towns of Grant County with the exception of St. Gertrude. St. Gertrude was originally established as a Catholic Church but has since added a parochial school and several business concerns in recent years. The transportation map of Grant County illustrates the relationship of highway and rail facilities in the county (Fig. 37). It will be noted that the east-west arteries dominate the transportation scene.

Air transportation in Grant County is extremely limited. There is only one airport in the county, located at Elgin. It is only a sod landing strip with hanger facilities but provides no scheduled transportation service. Several ranchers and farmers also have private planes and their own landing strips located throughout the county. Air transportation plays an insignificant role in the overall transportation system of the county.

Education

Education is a vital function of any political unit. Grant County includes all or part of 16 school districts (Fig. 38).[9] Of these 16 districts, 5 are included in the school districts of Morton County, 4 are Grant County districts including 3 public schools and one parochial school, and 7 are rural independent schools which still operate from a

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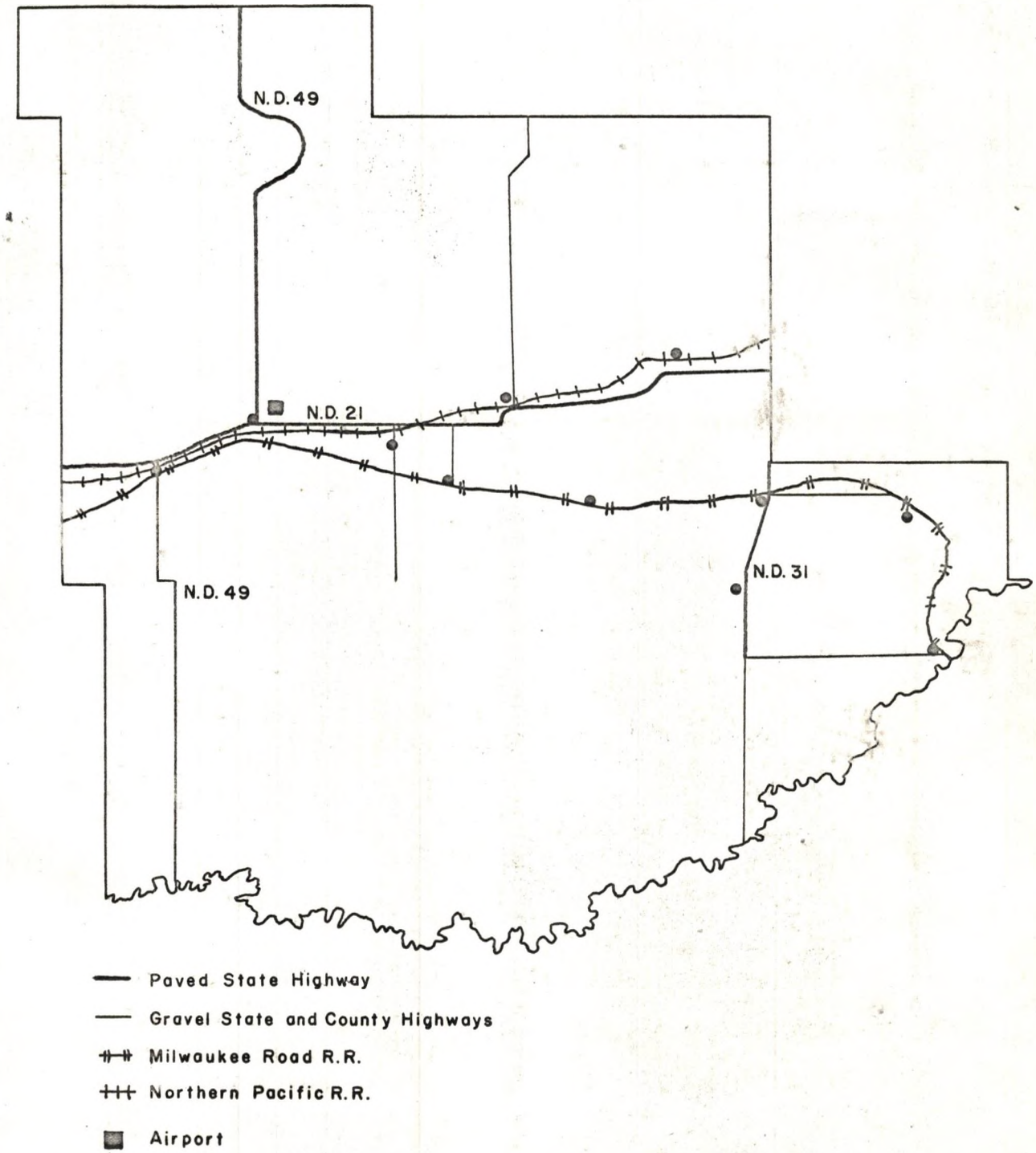
[9]Interview with Quentin Michaelson, Grant County Superintendent of Schools, July 7, 1966.

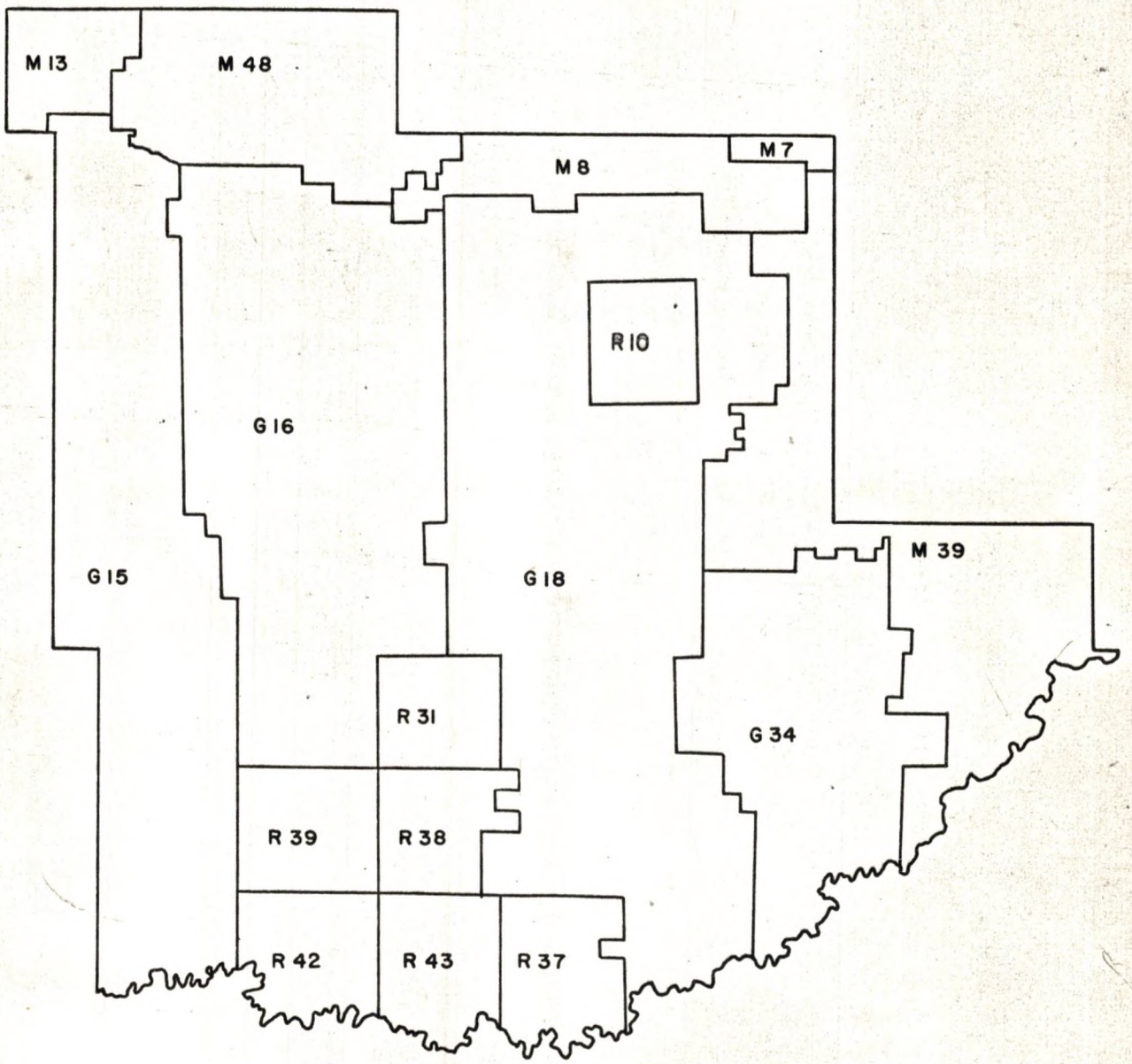
GRANT COUNTY
TRANSPORTATION



Scale 1:500,000

Fig. 37

GRANT COUNTY
SCHOOL DISTRICTS, 1966



G- Grant County Districts

M- Morton County Districts

R- Rural Independent Districts

Scale 1:500,000

Fig. 38

Fig. 39.--Carson High School.

Fig. 40.--A typical rural one-room school.

TABLE 7

EDUCATIONAL CHARACTERISTICS OF GRANT COUNTY, 1966[a]

District	Grade Pupils	High School Pupils	Total
G 15	177	78	255
G 16	273	159	432
G 18	179	125	304
G 34	166	75*	241
R 10	13	--	13
R 31	15	--	15
R 37	9	--	9
R 38	10	--	10
R 39	11	--	11
R 42	9	--	9
R 43	18	--	18

[a]Data obtained from a personal interview with Quentin Michaelson, County Superintendent of Schools, July 7, 1966.

*Parochial, Catholic high school.

one room school house (Fig. 40).

It will be noted from Table 7 that the Elgin district, G 16, educates the largest number of children in the county. The 7 rural districts accounted for only 75 of the 1307 students educated in Grant County in 1966.

Religion

Shortly after the settlers began to arrive in Grant County, a need for churches was realized. At the present time Grant County has a total

Fig. 41.--Catholic Church, Carson.

Fig. 42.--A rural Lutheran Church.

TABLE 8

CHURCH DENOMINATIONS OF GRANT COUNTY[a]

Denomination	Number of Churches
Lutheran	13
Catholic	9
Congregational	5
Presbyterian	4
United Church of Christ	2
Evangelical United Bretheran	2
Assembly of God	1
Methodist	1
Reformed	1
Baptist	1

[a]Calculated from: Thomas O. Nelson Co., Atlas of Grant County, North Dakota (Fergus Falls, Minnesota: Thomas O. Nelson Co., 1964).

of 39 churches, ranging from large, impressive structures to small rural chruches scattered throughout the county.[10] In the county, as in the state, the dominant religion is Lutheran. In total number of county churches, the Lutheran Church leads with 13 churches, followed by the Catholic Church with 9. Table 8 points out the number of churches, by denomination, in Grant County.

Recreation

According to Webster, recreation is a refreshment of strength and

[10]Thomas O. Nelson Co., Atlas of Grant County, North Dakota (Fergus Falls, Minnesota: Thomas O. Nelson Co., 1964).

Fig. 43.---Public Beach at Lake Tschida.

Fig. 44.---Pretty Rock National Wildlife Refuge.

spirits after toil. Recreational activities in Grant County are limited but varied. The leading recreational spot of the county is Lake Tschida. The lake is used for all types of water sports and camping in the summer months and recreational fishing takes place year around. Grant County has a variety of wild game and hunting is a popular sport nearly all year around. Deer, antelope, fox, jack rabbits, game birds, and waterfowl are all found in the county. The county has one wildlife refuge designed to protect and preserve the county wildlife. This is the Pretty Rock National Wildlife Refuge located 10 miles south of New Liepzig.

Additional recreational activities include the annual Grant County Fair held at Carson, numerous rodeos throughout the county during the summer months, organized baseball and softball leagues, various dances, parties, and other sponsored social events throughout the year.

CHAPTER IV

CONCLUSIONS

Area Problems

Problems of Grant County are not pressing at the moment, but in time, some of the present minor problems of the area could develop into problems of a serious nature. The climate of the county does not generally pose a threat, but because of its continental nature, extremes of all climatic phenomina are possible. Severe blizzards, lack of rain at the proper time, hail, and frost all present a threat to the basic economy of the county. The soils and land resources of the county are generally of good quality. However, areas do exist which are barely adequate to support even small numbers of livestock, let alone cash crops. These areas of rugged topography and poor soil are of little use to the area at the present. A dependable water supply also presents a problem and the vast majority of county farmers are primarily dependent upon rainfall for their moisture requirements. The area has only a few permanent streams; the rest are intermittent. Irrigation is practiced where practicable, but the area is naturally limited by the physical aspects of the region.

A problem of the county which could expand to serious proportions is the over-dependence of the area upon agriculture. If agriculture should decline or fail for some reason, the economy of the entire county would suffer. The economy of the county is dependent upon agriculture and has no other industrial base to "back it up".

The cultural realm of Grant County geography presents only one major problem. That is the problem of population loss or out-migration. From 1960 to 1965, Grant County had an out-migration rate of 13 percent. This means that over a period of 5 years, the county could not absorb 867 people into the economy. It is indeed a problem when the economy of the county can not absorb the natural population increase. However, it is a typical problem of rural areas dependent on agriculture. The state has much the same problem concerning population as the county, only to a lesser degree.

Future Potential

The potential of Grant County lies in the same general areas as the problems that face the county. The greatest potential for future county development lies in the possibility of a diversified economy and in the comparative availability of population numbers. Grant County has vast lignite beds which are a possible asset to the future economy. Several lignite generating plants are being established in the state and if this method of electrical generation proves practical, the lignite supplies of Grant County could turn into a major economic asset. Also, the potential for oil discovery can not be overlooked. Because of the counties location, the potential for oil discovery does exist and test wells are being drilled at the present time. These factors all lead to the potential for a diversified economy; one which is not overly dependent upon agriculture for an existance.

Another asset of the county is the available labor supply. It has been noted that Grant County is presently turning away people. Should an integrated economy come to the county, a potential labor supply would be available and the out-migration rate may be eliminated or reduced.

Grant County does have problems, but potentials are also there. Only the future will dictate which, the problems or the potentials, will encompass the future development of Grant County.

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