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THE HUMAN ECOLOGY OF THE GREAT PLAINS AREA

CHAS. P. LOOMIS,

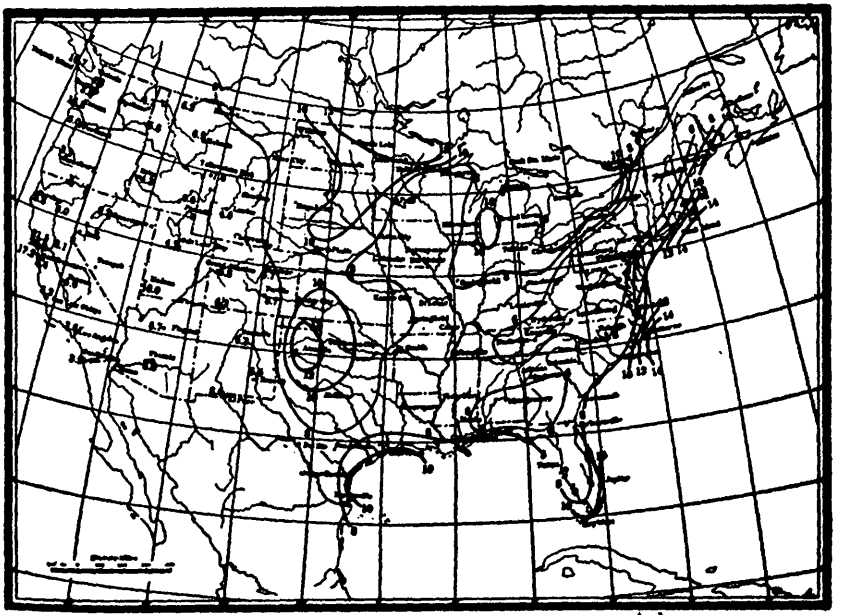
Senior Agricultural Economist, Bureau of Agricultural Economics, United States Department of Agriculture.

I. PHYSICAL CHARACTERISTICS OF THE GREAT PLAINS AREA.

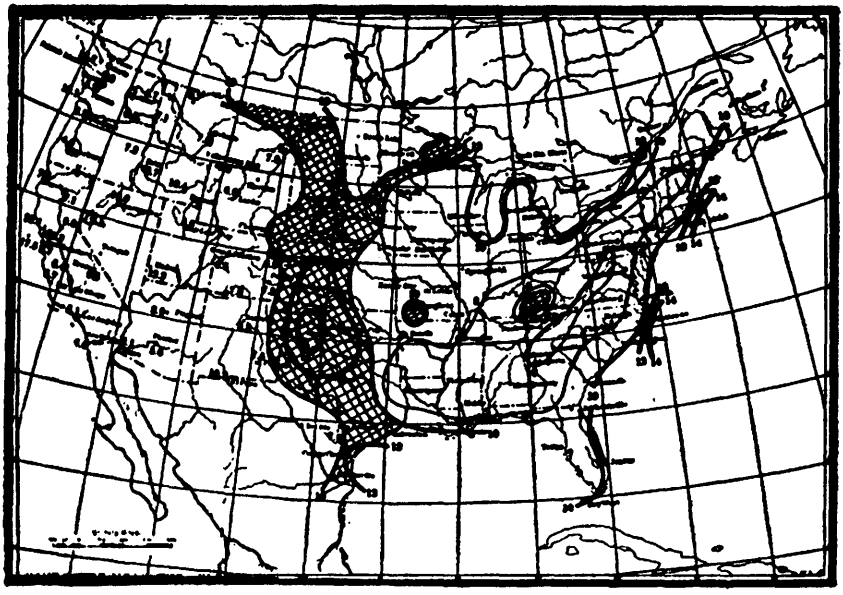
The Great Plains area has been delimited differently according to various criteria. It may be said to occupy approximately one-half of the area west of the Mississippi River. This area is about 1300 miles in length

extending from the Canadian border southward, and ranges from 200 to 700 miles in width from east to west. The region is bounded on the west by the first range of the Rocky Mountains and on the east and south by the boundary line designating the 20-inch rainfall zone. In order to use census and other data which have been collected for units larger than minor civil divisions, the following ten states have been designated as the Great Plains States: Montana, Colorado, Wyoming, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota and North Dakota.

The area is characterized by great variations in geographical and climatic conditions. In general it may be said that one finds darker soils as one travels from west to east and the lime carbonate accumulation drops farther and farther, finally disappearing altogether where humid conditions are associated with the leaching of the carbonate. The terrane slopes downward from west to east. The altitude on the west boundary ranges from 4500 to 6500 feet and the altitude on the east averages about 1000 feet. Precipitation in the Great Plains is low but there is great variation in both time and space. Kansas records show that since 1868 there have been three major drought periods. Tree rings and lake beds indicate that there had been three periodic droughts long before this date. With the exception of Coastal and Great Lake areas the region has the highest wind velocity of any large area in the United States. This is extremely important because if other areas in the Nation with greater precipitation were characterized by the high wind velocity of the Great Plains, other things being equal, their flora would differ greatly. The wind velocity chart when compared with other charts showing conditions in the area indicates

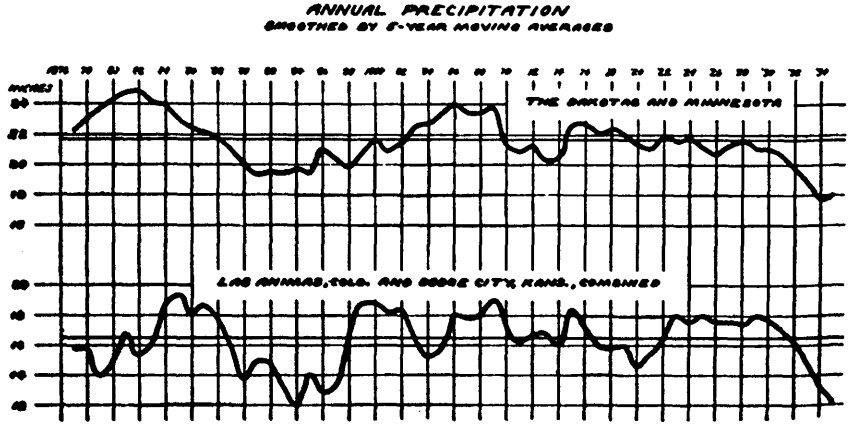


Average hourly velocity of the wind at 6 a. m., local standard time, the approximate hour of least wind movement. Estimated for elevation of 100 feet.

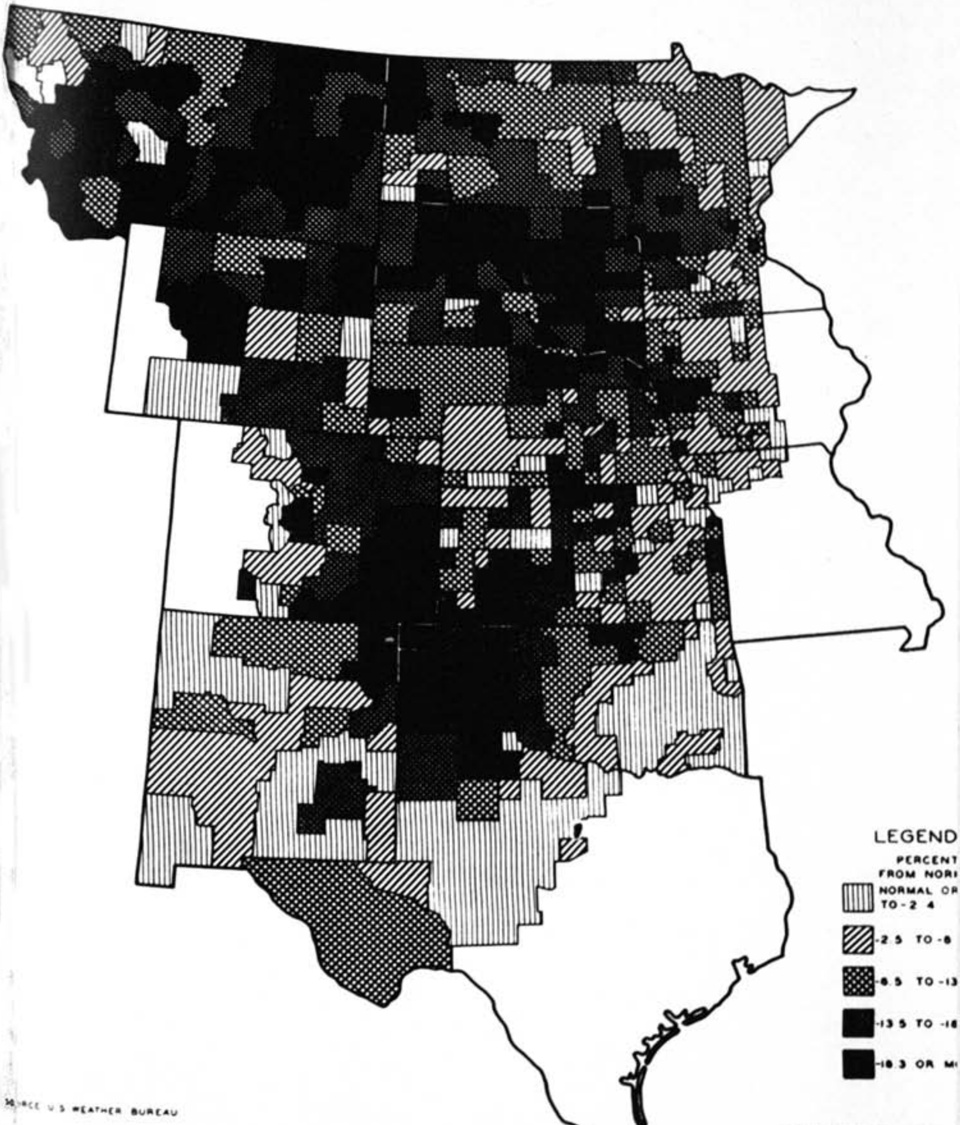


Average hourly velocity of the wind. Estimated for elevation of 100 feet.

that the areas of highest wind velocity most frequently are those where distress during the last drought period has been most acute. Likewise, the chart showing the departure from normal rainfall from 1930 to 1935 is also correlated with indices calculated to indicate the distress in the area during the drought.



PERCENT DEPARTURE FROM NORMAL RAINFALL IN GREAT PLAINS DROUGHT AREA 1930 – 1935



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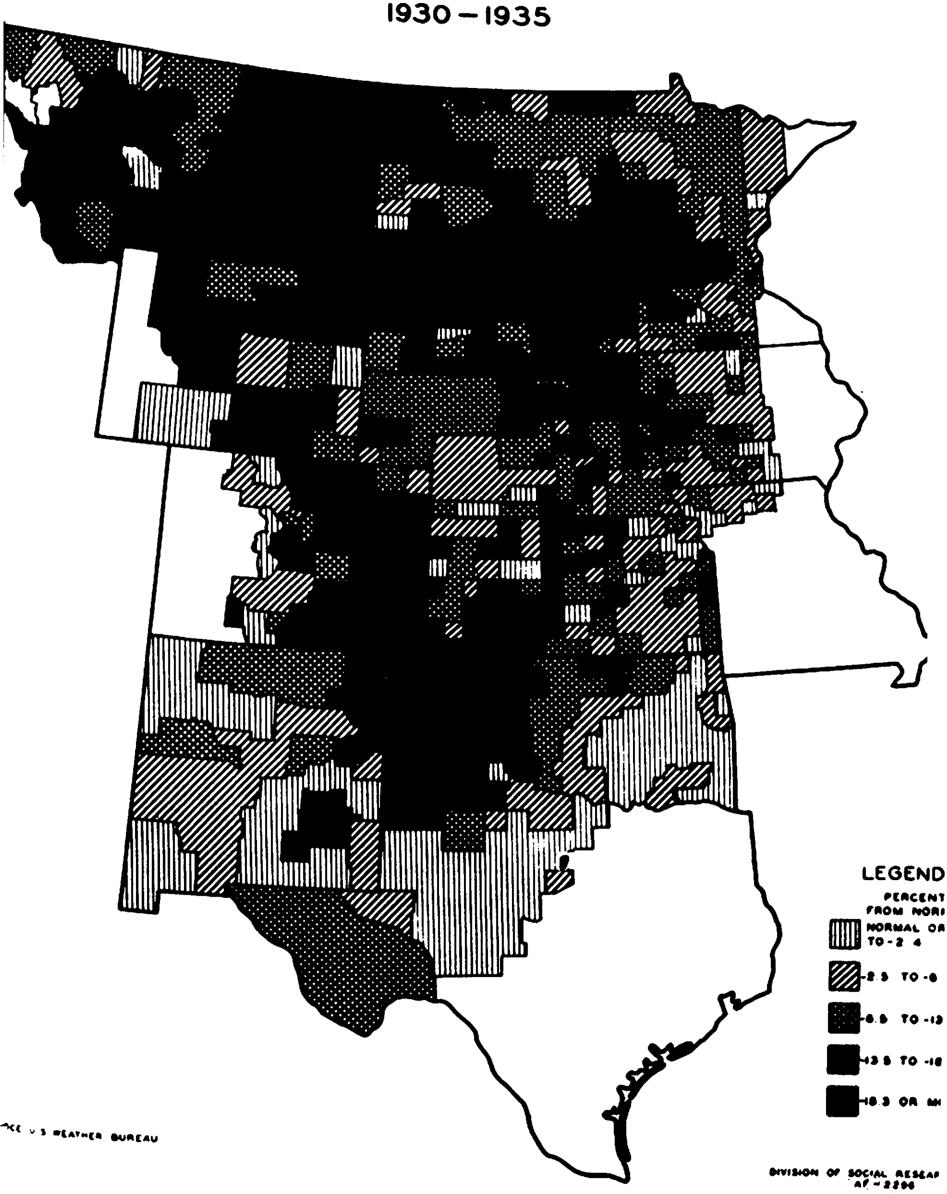
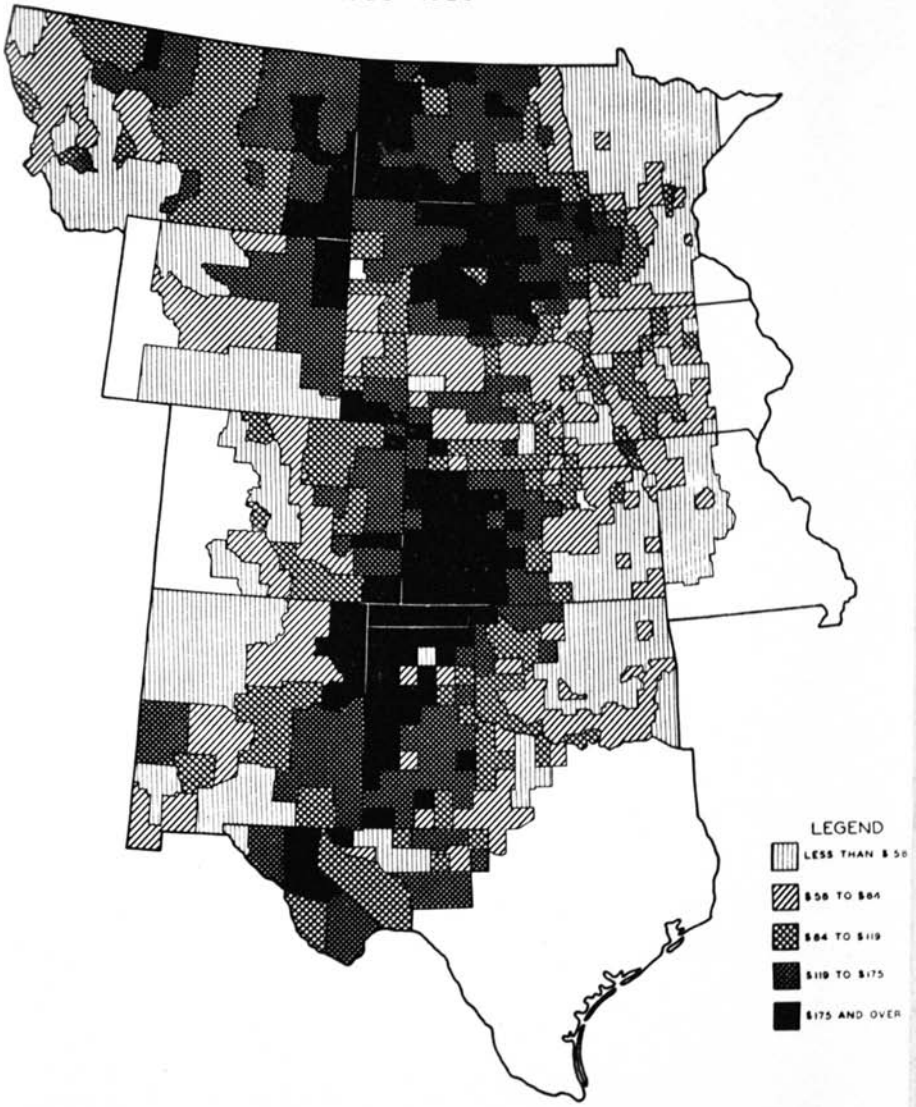


INTENSITY OF FEDERAL AID PER CAPITA IN GREAT PLAINS DROUGHT AREA 1933 - 1936



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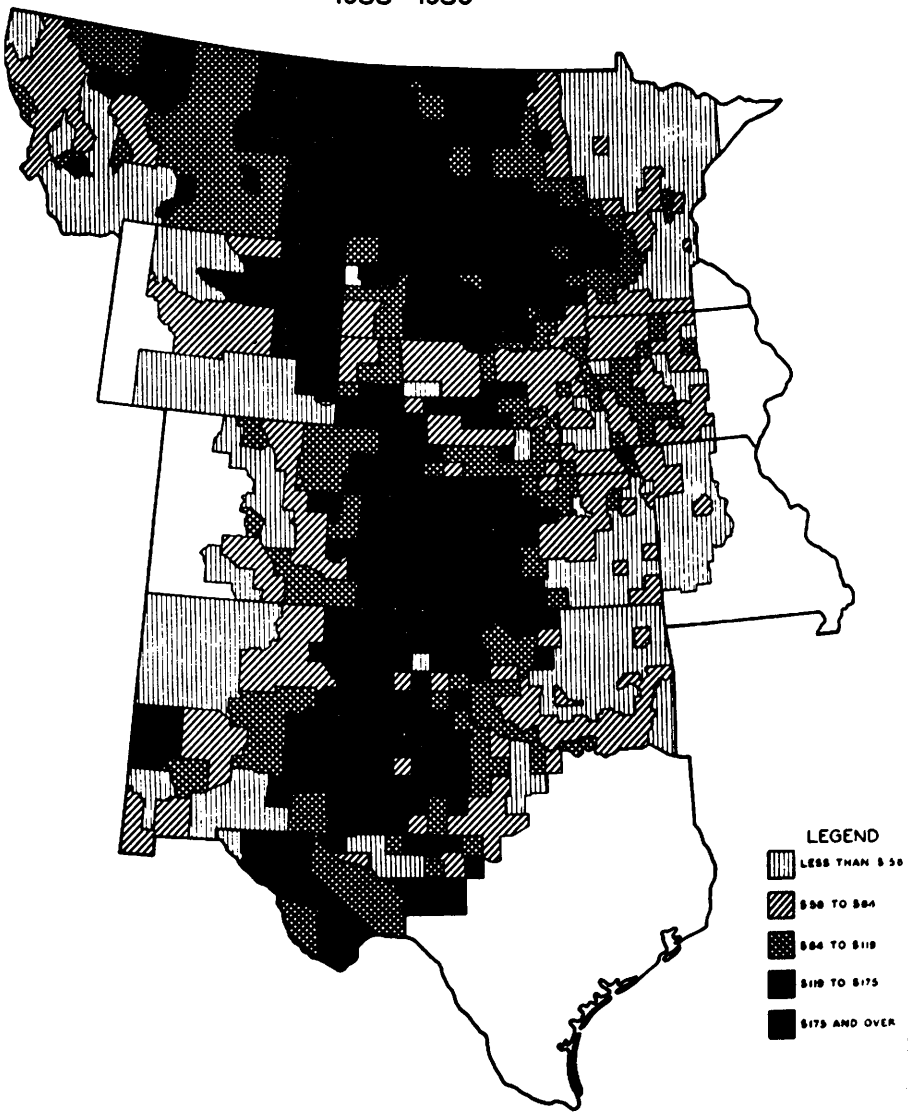


II. EXTENT OF THE DISTRESS RESULTING FROM THE PRESENT DROUGHT.

From March 4, 1933, to June 30, 1936, Federal aid in the form of grants, allotments and payments which were furnished the inhabitants of the 10 Great Plains States amounted to $1,951,912,599, while the Federal loans of this same period amounted to $1,538,024,118. The actual grants, allotments and payments for the three-year period amounted to about one-third the total sale value of the dry-land farms of the area. Loans, grants, allotments and payments taken together amounted to about two-thirds of the value of the land in dry-land farms. During the three-year period enough Federal money was paid into the area to give every man, woman and child $126 in grants, allotments and payments, and a loan of $99. Since 1929 more money has entered some counties of the area in the form of relief and grants than the total value of the dry-farming land. The 10 Great Plains States during the period from March 4, 1933, to June 30, 1936, received 17.1 per cent of all Federal grants, allotments and payments, and 16 per cent of all loans made by the Federal Government went to the Great Plains States. The distress present in the area is evident when it is realized that only 12.1 per cent of the population of the country lives here. The present general drought is cumulative, having begun in 1931 or before in the northern portion of the area.

Although there have been other droughts in the region, none has been more serious in its general disastrous effects on the soil. It has been estimated by the Federal Soil Conservation Service that 65 per cent of the total area in the Great Plains has been damaged by wind erosion. Of this, 15 per cent has been seriously damaged and 1 per cent utterly destroyed. Soil has blown hundreds of miles. In some instances all soil turned from the "plow sole" to the surface has been blown from a field in the course of only a few days.

This area is surpassed only by the Cotton Belt as being predominantly agricultural as determined by the proportion of the total population which is rural, lives on farms and is gainfully employed in agriculture. Any consideration of the social and economic influence of the drought must, therefore, consider changes in farm population. On January 1, 1935, the number of people on farms in the 10 Great Plains States was almost the same as five years previous. During 1931 and 1932 there were slight increases in all states. However, during 1933 the farm population of North Dakota, South Dakota, Montana, Colorado, Oklahoma, and Texas declined. In all ten states there was a decrease in farm population in 1934 and, with the exception of Nebraska, again in 1935.

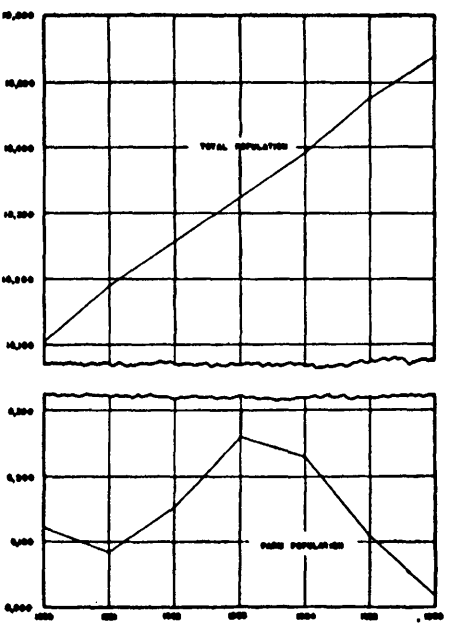
During the five-year period from 1930 to 1935 there has been witnessed a striking arrest of growth of the population in these states. According to estimates of the Bureau of the Census, five of the states—South Dakota, Nebraska, Kansas, Montana and New Mexico — lost population between 1930 and 1935. Each of the other ten states, except Colorado and Oklahoma, lost more persons to other states than entered from other states, but excess of births over deaths was still great enough to provide a continued increase.

III. THE SETTLEMENT OF THE GREAT PLAINS AND ACCOMPANYING PROBLEMS.

The exploitation of the natural resources of the Great Plains which began with the wasteful slaughter of the millions of buffaloes which roamed the plains and finally culminated in the present conditions has been one of the most disastrous, yet romantic, chapters in our national history. In the early days the cattle country lay in the Southwest where a Spanish-Indian-American culture had developed which was well adapted to the

unique geographical characteristics of the area. The cattle shortage caused by the Civil War led to a great expansion in the cattle business in the whole Great Plains area. Ranges were soon overstocked and meat prices fell. At the present time overstocking of the ranges is a serious factor in the destruction of the ranges. The Secretary of Agriculture has estimated that the cattle ranges are now carrying 60 per cent more livestock than they should for their most efficient use. However, although overgrazing has since that time been an important factor in erosion, it is doubtful if the present dire conditions would ever have developed had it not been for the coming of the plow.

TOTAL AND FARM POPULATION IN THE TEN GREAT PLAINS STATES, 1880-1930



During and after the Civil War the plow culture of the East began to spread West bringing with it sod houses, drilled wells and windmills. Streams of settlers poured into the area after 1890 and by 1910 the movement had reached its peak. In 1860 the Census reported only one million persons in these states. Between 1900 and 1910 the population increased by three million and during the next two decades, 1910 to 1920, and 1920 to 1930, at the rate of two million persons per 10-year period.

The drought in the nineties served only as a temporary check. The increase from 1920 to 1930 was 1,991,861. From 1930 to 1936 the increase as estimated by the Census Bureau is 466,400.

Governmental encouragement and series of good crop years and high wheat prices had kept the streams of migrants pouring into an area of relatively frequent droughts, grasshopper plagues and blizzards. A unique culture sprang quickly into being.

IV. ORIGIN OF THE SETTLERS. ITS INFLUENCE UPON AGRICULTURE.

In order to understand the culture of the area one must study the background of the settlers. In 1910, 23.4 per cent; in 1920, 18.2 per cent; and in 1930, 15.0 per cent of the residents in the Great Plains States, excluding Texas, were from the five states, Missouri, Illinois, Iowa, Ohio and Indiana. In 1910 over one-fourth of the population residing in Kansas was from these five states. These migrants and those from Europe and the South knew only the intensive moldboard plow culture. To them a man who did not turn his soil completely over and pulverize it was slothful. To allow stubble to protrude as it does after the soil is partially turned with the disk-harrow or plow was to demonstrate one's laziness. Wheat seed beds were made as gardens had been made in the state or county of original residence. There were no experiment stations to determine better methods. Professor Malin's historical study of adaptation of agricultural methods records a group discussion in which persons advocated the use of the check row planter as ardently as their opponents argued for the lister. In short, the good farmers of the humid areas often made the poorest farmers in the Great Plains as far as the practice of soil conservation is concerned. To make matters worse, the homesteading laws forced the 160-acre unit upon settlers. It required them to break the sod when often the soil should never have been turned and where the units should have been much larger and devoted to grazing. Cattle raising was impossible under homestead regulations except where "dummy" entries were made.

The difficulties encountered by these farmers who came from the humid regions are eloquently expressed in the many failures and the great mobility. It is estimated that prior to 1916 only about 60 per cent of the original homestead entries were completed. Since that time only 45 per cent of all entries have been perfected. Of course, many farmers failed even after having proved on their homesteads.

In a few decades a vast area of land covered with a thick tough layer of grass roots which would have furnished forage for millions of sheep and cattle, has been plowed under. Tons of this soil have been blown away leaving in some places a worthless desert. Much of the damage is irreparable. Droughts and dust storms will probably always continue to visit the area since high winds and periodic low precipitation are characteristic. To save the area will require a type of agriculture which can support only part of the present residents.

V. CHARACTERISTICS OF THE POPULATION.

The characteristics of the Great Plains farmer and his society are to be found in very few agricultural regions in the world. After visiting the area Sir Horace Plunkett, the great reformer of Irish rural life, states that he was in a country where "the rolling stone gathers most moss." Further, he describes our farmers as people who became land poor and who, "in order to meet the installments of purchase and high interest on their mortgages, invented a system of farming unprecedented in wastefulness. The farm was treated as a mine. . . ."

Population migration has characterized the area; the rural inhabitants of the Great Plains have been rolling stones, but much of the moss gathered has been invested in more land or other property which lost all value or was greatly depreciated during drought and depression periods. A recent study in western Kansas revealed the fact that of farmers who were there in 1895, two-thirds had left within ten years and that only one-tenth were living in the same areas in 1935. Of all farmers in 1905 in the area studied, two-fifths remained at the end of ten years. Relatively about the same number disappeared from the areas during the following ten-year period. Dr. Taeuber, of the Bureau of Agricultural Economics, has estimated that from 1930 to 1935, the number of persons changing residence from towns and cities to farms made 1,570,000 moves. This number of moves is 25.7 per cent of 6,111,836, the total farm population of 1935. The number of persons who changed their residence from farms to towns and cities made 1,953,000 moves, or 32.0 per cent of the 6,111,836 persons living on farms in 1935. In addition, the net number of persons who left farms in this area to go to farms elsewhere was 60,000. The 1935 Census shows 356,327 persons on farms who were not there in 1930. Most of the dry-land farming counties from the Oklahoma Panhandle north to the Canadian line showed from 200 to 500 persons per county on farms who were not there five years previous. And all this migration has resulted in no significant change in the total farm population.

When confronted with such data indicating the high mobility of the people of these Great Plains, one might become mystical and say that it is unnatural for soil, snow or man to stay put here. However, one need not be mystical in order to find cause for the great mobility of the people of the plains. From the period of first settlement to the present there have been few elements in the culture which were conducive to stability and permanence of residence. Tenancy has increased in the ten states from 15.5 per cent of all farmers in 1880, to 41.0 per cent in 1935, and tenants are more mobile than owners. This is adequately demonstrated by Census data which show that 10 per cent of the owners in the area have lived on the farms they now operate for one year or less as compared with two-fifths of the tenants. Most all studies in which the mobility of owners and tenants is compared indicate higher mobility on the part of tenants.

Had there been no migration to or from farms in these states the total farm population would have increased 100,000 each year during the five-year period from 1930 to 1935. The birth rates of the farm population of the Great Plains States are among the highest of the Nation. Since the number of persons on farms in the area remained almost unchanged between 1910 and 1935, the farms furnished at least two and one-half million persons to the nearby towns and cities and to rural areas and cities of other states. Dr. Taeuber of the Division of Farm Population and Rural Life, United States Department of Agriculture, estimates that nearly one-half million more persons moved from farms than moved to farms in this region during the five years between 1930 and 1935. This was 100,000 less than one-half as many as moved away from farms in the preceding ten years of urban prosperity, 1920 to 1930. During this decade the net movement from farms amounted to 1,200,000.

The people in the Great Plains are still rolling stones. Also they are still as enthusiastic gamblers and speculators as when Plunkett saw them mining the soil to pay high interest rates for land bought at speculative prices. Even though the homestead law went into effect in 1862, there was little curtailment of land speculation. Land companies and

speculators were still making huge profits from sales to hopeful settlers as late as 1920. The land for this speculation was purchased from the Government, railroads, or other settlers. Reports have shown that in the most drought-stricken, dust-blown counties a few rains have been sufficient to bring back many migrants ready to try for another crop. Their very life has been one of gambling against nature and the market and the odds have been extreme. Since the advent of tractors, combines, disk plows and power drills, the whole work on a large tract — both harvesting and planting — can be accomplished in six weeks. Under these conditions suit-case farming flourishes. There is no longer any necessity for living on the land. This generation of Great Plains farmers probably never had its parallel in previous history. Increase in the number of establishments retailing these farm machines in some of this area and in bordering areas of distress is sufficient evidence to prove that the drought has only temporarily arrested the extension and perpetuation of the "dust bowl."

VI. SUMMARY AND SUGGESTIONS.

After three-quarters of a century of faulty land settlement practices, the Federal Government finds itself pouring millions of dollars into the area in the form of grants, allotments, payments and loans. This is, of course, only an insignificant portion of the cost of lack of foresight. To reclaim the lands which have been partially destroyed will involve great expenditures. But the greatest penalty paid for the policy of attempting to force an agricultural pattern suitable to humid regions lying to the east has been registered in human failures and disappointments.

It has been estimated that there are 900,000 people living in the 10 Great Plains States, or 210,000 more families than a stable well-adapted agriculture calculated to at least partially reclaim the areas can support.* Other reports estimate the excessive number of inhabitants as being greater. What is to be done with these people? We must admit there is no immediate solution of this problem.

Although the natural increase in population in this area as in all other areas in the United States is falling off, under normal conditions it will be many years before there is no excess of births over deaths. It has been estimated that if there were no net migration from farms, the population of North Dakota would increase 60 per cent by 1960.** Under normal conditions migration to cities within, and cities and rural areas outside the area must continue. There is, however, no basis for estimating the number of individuals which the cities of the nation can absorb in the future. However, the surplus population now living in the Great Plains will not in the near future be lessened by the decrease in the excess of births over deaths because the inhabitants are relatively young and fertile.

It would be the most flagrant of follies to assume that the future conservation of the areas could be left entirely to individual initiative. The lessons of the last few years must teach us this. When farmers have no equipment for listing and otherwise protecting the soil, they cannot be expected to practice soil conservation without assistance. In addition, much of the land must be resodded and individual enterprise will seldom find this process profitable. Even were some individual farmers willing to practice soil conservation methods, they could not be certain that their strips of grass lands might not be covered by drifts from neighbors' farms if conservation were to be carried on under *laissez faire*.

*Goodrich, Carter - et al. Migration and Economic Opportunity - P. 243.

**O. E. Baker, using Thompson's and Whelpton's estimates.

Although some lands may be made available for settlement by reclamation, the past has proved that few such lands can be farmed on a basis which will pay project first costs and upkeep. This does not mean, however, that many such lands should not be reclaimed by irrigation and drainage when such reclamation does not seriously conflict with national plans for agriculture. The cost of maintaining stranded populations will be great whether they be on relief or settled upon irrigated land. The latter possibility would to a considerable extent prevent further exploitation of drought lands and might make possible their reclamation.

Because of a combination of factors, including destructive farm practices resulting from faulty settlement methods on the part of the government and lack of knowledge of how to adjust in an arid region on the part of the farmers, the over-extension of tilled crops with the destructive practices attending this expansion, the over-grazing of range lands, and the immediate condition of insufficient precipitation, the following conditions have resulted: (1) Billions of dollars of Federal funds have been poured into the area in the form of grants, allotments, payments and loans. (2) Much land which would have been useful for either grazing or dry-land farming purposes has been utterly "wrecked." Thousands of acres of land (it is estimated as being 65 per cent of the soil in the Great Plains States) have been damaged by wind erosion. (3) Mobility of the farm population has been extreme and would be even greater if Federal aid had not been made available during distress periods. (4) The size of holdings has not been adjusted to the natural soil and climatic conditions which prevail in the area. (5) Land speculation has been extreme and has resulted in excessive indebtedness. (6) The proportion of farms operated by tenants has more than doubled in the last fifty-five years.

In short, agriculture has expanded in the area on the basis of experience and patterns established in other regions where humid climatic conditions prevail. Series of years during which the annual precipitation was relatively great and grain prices high, led to over-expansion of the tilled acreage often on a speculative basis. Few of the elements necessary for a stable family type of agriculture have been present. The high rate of migration; the rapidly changing type and size of farm; extreme and irregular variations in climatic conditions; great variations in prices received for farm products, as well as the pevailing speculative attitudes of farmers in the region, have contributed to an extremely unstable type of rural society. During periods of prosperity expenditures for institutional facilities have been excessive and have led to public indebtedness which cannot be liquidated. The total social and cultural pattern is not in harmony with the natural elements existing in the area.

In order to establish a stable, well-adjusted agricultural society in this area many adjustments must be made. Soil conservation on the scale required by the prevailing conditions and adaptation of the farm practices and general culture of the area cannot be accomplished by private initiative. Much must be accomplished through present governmental institutions and agencies which have been established to cope with the problem. Until an agriculture can be developed on a stable basis it is doubtful if programs of soil conservation can be effectively administered. Furthermore, it is doubtful if periodic expenditures of federal funds for aid can be obviated unless a family type of agriculture be established which is in harmony with the soil and climatic conditions of the area. The following recommendations have been calculated to contribute to the establishment of such a stable self-supporting rural economy: (1) Lands which have been so seriously damaged that there can be no hope of their redemption through private initiative should be

acquired by the Federal Government. Such lands should constitute a national domain, the use of which will be rigidly controlled. The utilization of this domain should not only lead to its reclamation and conservation but should serve as a lever for forcing adjustments in privately owned enterprises. The land in the domain thus established could be made available to only such persons whose utilization of privately owned land was in harmony with recommended practices. Conservation projects on these and also private domains would also serve as a means to educate inhabitants in the area in the best land use practices. (2) Grants, allotments and payments to individuals should be made only when and under conditions calculated to lead to satisfactory use of the soil. (3) Other funds expended in the area should be used to conserve water supply and reclaim land where practical. Additional legislation will be required in order that agencies now existing may better accomplish the adjustments necessary. However, regardless of the extent and character of the legislation enacted, the necessary long-time adjustments in the area must be accomplished to a considerable degree by educational techniques. Most of the misuse of natural resources has been the result of farming methods which were not suitable for the region. As has been emphasized above the type of agricultural system which prevails was founded upon basic habits and attitudes inimical to conservation policies. These habits and attributes must be changed. The farm operators of the area as well as all inhabitants must be made "conservative-minded." A widespread and profound educational program must be launched at the earliest possible moment. Already through the three-phase program—research, extension and resident teaching — the Land Grant Colleges are attempting to bring about adjustments. For instance, in these states there are 835 county agents and 446 home demonstration agents at work. In the experiment stations research is being conducted and in the colleges conservation practices and techniques are being taught students who will become future extension specialists, teachers, farmers and members of other professions in the area. Other educational institutions in the area may be used as instruments for the propagation of information which will lead to the establishment of correct soil conservation practices and attitudes. Likewise, the Resettlement Administration is not only purchasing land which should be retired from its present use, and resettling families, but, through its rehabilitation program it is attempting to establish farm practices which will be in harmony with the conditions prevailing in the area. The Federal Department of Agriculture through its Bureaus of Agricultural Economics, Biological Survey, Plant, and Animal Industry, Agricultural Engineering, and its Forest Service and Agricultural Adjustment Administration, is engaged in an action as well as an educational program which should materialize in the establishment of conservation practices. Also its Soil Conservation Service with its demonstration areas is attempting to carry on an educational and action program. Many other agencies such as State Planning Boards, State Departments of Agriculture and State Departments of Conservation and Education, are still attempting to assist in carrying on a conservation program. In addition, there are many private and non-Governmental organizations which are attempting to promulgate conservation. Such organizations as the National Wildlife Association, the National Forestry Association, the National Association of Audubon Societies, the Izaak Walton League and the Junior Waltonians, the National Recreation Association and similar units are also engaged in conservation programs.

If there is to be a long-time conservation program, it must rely to considerable extent upon a program of education. The country is badly in need of a coordinating agency which will promote an educational program

designed to inculcate conservation practices through the existing agencies. Such an educational program should be developed by an agency which would coordinate the activities of all existing institutions and agencies.

In conclusion, it may be stated that the development of a culture which will, because of the character of its own institutions and because of the mores and attitudes of the people, be stable through periods of drought and depression as well as periods of abundant precipitation and prosperity, is not beyond the realm of possibility. One need only mention the many pastoral peoples which exist as relatively stable societies based upon the family type of agriculture. As a goal we should strive toward a resident family ownership economy. It is true much of the land should be owned by the Government and leased to individuals, but where private ownership is in accord with the interests of conservation individuals should own the land. However, individual ownership should not mean that land should necessarily be as it has in the United States — a free good to be held and disposed of by speculators at excessive prices. The agricultural society which would come into being in these areas should eliminate high family mobility, land speculation, foreclosures and tenancy. A people with a high standard of living — both material and non-material — should perpetuate this culture to future generations.

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