THE "GREAT AMERICAN DESERT" AT THE EASTERN BASE OF THE ROCKIES: ORIGIN OF THE NOTION AND OCCUPATION OF ITS SUPPOSED AREA.

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Introduction

A factor which exerted a considerable influence upon the course of Western United States history was the notion of a great American desert. With the western portion of our country in its present state of development it is, of course, difficult to appreciate this old notion of a desert extending eastward from the Rocky Mountains into central Kansas and Nebraska. Nevertheless there is no doubt that such a notion of a desert did exert a considerable influence on the course of western history.¹

But the purpose of this study is not to examine the influence which the "Great American Desert" exerted upon the occupation and development of the West. It is, rather, to investigate the origin of the notion of this "desert", its location, the climatic basis for such a notion of a desert, and finally the occupation and development of this supposed desert. The last part of this work will consist of a study of the development of Weld County, Colorado, as illustrative of the development of the entire region once known as the "Great American Desert".

In this study the term, "Great American Desert", will be used in the sense of a name given to a more or less definite portion of what was once considered a vast western desert region. This region which shall be under consideration, and which shall constitute for us the "Great American Desert" will be limited to the territory lying between the Rockies and approximately the 100th meridian on the west and east respectively, and between Canada and Mexico on the north and south respectively. (See the accompanying map).

The Origin of the Notion of the "Great American Desert* and its Location.

In examining the origin of the notion of the "Great American Desert*, attention must be given to the work of the Spaniards who explored the western part of our West at an early date. For a quarter of a century following Columbus' discovery of America, the Spanish conquistadores seem to have been content with expounding the simple natives of what is now the southern part of our country. Little attention was paid to exploration to the north. In 1591 or 1592 Serrandika had been sent up the Pacific coast farther than Santiago, which has a latitude approximately that of Tampico. In 1531 the Spaniards extended their expeditions as far north as Culiacan under Ocampo. But Culiacan is nearly one degree of latitude south of the southwestmost point of Texas. It was the arrival of De Ulloa and his companions in New Spain in 1536 which was responsible for a development of interest in more extended northern exploration. These Spanish explorers visited several wonderful cities of which they heard, and some of these may have existed in New Spain, and some were sent to the north as the interest of the Spaniards again increased.

As a result of this new interest in northern exploration, Cortes set out in 1542 upon an expedition which was finally to take him into the central part of the present United States.
The Origin of the Notion of the "Great American Desert" and its Location.

In examining the origin of the notion of the "Great American Desert", attention must be given to the work of the Spaniards who explored a large part of our West at an early date. For a quarter of a century following Columbus' discovery of America, the Spanish conquistadores seem to have been content with exploiting the simple natives of what is now the southern part of Mexico and little attention was paid to exploration to the north. In 1527 Saavedera had been sent up the Pacific coast but he proceeded no farther than Santiago which has a latitude approximately that of Tampico. In 1531 the Spaniards extended their conquests as far north as Culiacan under Guzman. But Culican is nearly one degree of latitude south of the southernmost point of Texas. It was the arrival of De Vaca and his three companions in New Spain in 1536 which was responsible for a development of interest in more extended northern exploration. These four wanderers related stories of wonderful cities of which they had heard while wandering to the north of New Spain, and since these tended to verify rumors of the existence of seven rich cities somewhere to the north, the interest of the Spaniards was again intrigued.

As a result of this new interest in northern exploration, Coronado set out in 1541 upon an expedition which was finally to take him into the central part of the present United States.

He marched across the present state of New Mexico, the panhandle of Texas, the arm of Oklahoma, and probably into the south central part of Kansas. Thus Coronado was the first white man to visit and explore part of that region which was to become known as the "Great American Desert". From a letter which he wrote to his king October 20, 1541, we learn also that he was likewise the first to call attention to the desert like character of the country which he visited. Coronado complained in this letter of a lack of food and water which finally forced him to send back to New Spain all of his command save thirty horsemen with whom he proceeded. "After having journeyed across the deserts (for) several days," he stated, "I arrived at the province they call Quivira". Coronado must have thought this province hardly worth while to the Spaniards for he further stated in his letter that he had purposely been led into these "unhospitable wastes" by his guides so that he and his men would die of hunger and thirst.

It was not until forty years later, 1581, that another exploration was undertaken by the Spaniards into the north. A Franciscan lay brother, Fra Augustin Rodriguez, organized this expedition, which marched from New Spain into the present United States as far as the vicinity of Albuquerque, New Mexico. From the Brief and True Account of the Expedition we read, "continuing our journey ... we ... travelled nineteen days with great hardships and disappointments and without being able to see any people or any living thing."
They were then fortunate enough to find a lonely Indian who directed them to a certain pueblo near the present site of Albuquerque, which they reached after another day's travel, and there obtained food.

In 1593-4 a couple of adventurers, Bonillia and Humana, led an unauthorized expedition through the southwestern part of the present United States to the vicinity of the present city of Wichita, Kansas. Although it is not definitely known, they may have gone as far north as the Platte river. Nearly all of the members of the expedition were killed by the Indians, but one survivor has left his story which affords practically all that is known of this expedition. According to this the party did not suffer because of the desert like character of the country. The vastness and regularity of the plains impressed them and they were interested in the grass houses of the Indian inhabitants, and the herds of buffalo.

New Mexico was formally conquered and organized as a province of New Spain by Juan de Onate in 1598. After completing the organization of New Mexico, Onate decided to make a tour of exploration to the north of his newly organized province. Accordingly in 1601 he set out for the north with a small but well equipped military force and chose a course almost identical with that which Coronado and Humana had used. It is believed that Onate reached the same Indian villages which the first two Spanish explorers visited. After having explored some

of the country in south central Kansas, Onate foolishly provoked the hostility of the Indians and was forced to return to New Mexico after a slight engagement with the inhabitants. Upon his return Onate spoke in glowing terms of the country through which his party had passed. He reported that the entire region was abundantly supplied with food and water; that there was considerable vegetation; and that the soil was quite fertile. This report of Onate's certainly does not check with that of Coronado who visited the same region sixty years before.

As an explanation of this situation of conflicting reports, it may be pointed out that in the region of light rainfall through which both of these parties were obliged to pass, the rainfall may be abnormally light for a period of years during which time vegetation almost disappears. Then there may follow a period of years during which the rainfall is abnormally heavy, and as a consequence the vegetation is profuse and luxuriant. It is possible that when Coronado visited this region it was during a cycle of light rainfall, and that when Onate visited it, the region was enjoying a cycle of heavier rainfall. Then it must be remembered that Onate had just organized one province and that he might have had a desire to organize also the elusive country of Quivira into a Spanish province. His enthusiasm for such a project might have led him to exaggerate the actual conditions as he found them.

There were numerous other expeditions undertaken by the

Spaniards before the opening of the seventeenth century which were confined to the territory lying in the present states of New Mexico, Texas, and Colorado, particularly in the first two. By 1601 the southern part of the "Great American Desert" had been explored to some extent, and something was known of it in a general way as far north as the present site of Wichita. It does not seem likely that the Spaniards believed this part of the "Great American Desert" to be more arable than desert-like for about their settlements at Santa Fe and Albuquerque the rainfall is lighter than in any other portion of the region under consideration.  

The first French to approach the "Great American Desert" so far as there is any record, visited the country about the mouth of the Osage river in 1688.2 There is a record of two French traders who were among the Missouri and Osage Indians in 1694 but whether they found evidence of a desert country in the territories of these Indians is not known.3 Later traders on the Missouri about 1704-05 have left no accounts of their observations so far as I have been able to find.4

By 1720 the French had become so active on the Missouri river that the Spaniards resolved to march overland from Santa Fe and drive them out. This task was undertaken by a Spanish force under Villazur, but it failed in its purpose, for in the country of the Missouri Indians it was almost totally destroyed by a combined party of these Indians and their French allies.5 There have been various conflicting stories of a party of colonists being attached to the Villazur expedition for the purpose of settling on the Platte or Missouri but these stories are now generally entire-

ly discredited. Since this expedition followed in a general way the routes taken by Coronado, Humana, and Onate, it would be interesting if some information were available to indicate the character of the country as this last expedition found it. It is not unreasonable to believe that by the middle of the eighteenth century the French traders had some knowledge of the country below the parallel of central Kansas far west as the edge of the "Great American Desert".

While the French traders were active in the lower Missouri valley between 1688 and 1750, a French trader by the name of La Verendrye became interested in the exploration of the country to the west of the Great Lakes. After numerous disappointments this remarkable Frenchman succeeded in reaching the Mandan Indian country in the general vicinity of the present site of Bismarck, North Dakota. He accomplished this feat during the winter of 1738-39 and thus antedated Lewis and Clark, who passed through this region, by more than sixty years. The only reference in La Verendrye's journal to indicate any desert-like characteristics of the Mandan country are found in his remarks about the regular topography of the country, the lack of wood, the brakish water, and the barren aspect of the region.

Equally as significant as the work of La Verendrye was the work of his son, Chevalier de la Verendrye, who, with a brother and two other men, crossed the "Great American Desert" from the Mandan villages to the Medicine Bow range of the Rockies in 1742-43. While in the Medicine Bow region, "we continued our march"

saying Verendrye, "sometimes southwest and then northwest." Parkman observes that this changing of their course was necessary because of the natural difficulties encountered in traversing this region. From his own observations made in 1846, Parkman describes the country through which Verendrye passed as being a rolling plain, well covered, for the most part, with grass, and watered with small alkaline streams. Verendrye's observations as to the character of this country are, unfortunately, not available. At the same time that the elder Verendrye was visiting the Mandan villages on the upper Missouri, two of his countrymen known as the Mallet brothers were en route across the "Great American Desert." Desiring to go to Santa Fe, they set out from the French settlements on the Mississippi and passed up the Missouri and the Platte. Realizing their error, they left the Platte and set off across the plains for Santa Fe which they reached in July 1739. In 1750 another French trader visited the Mandan villages. His visit is significant only in that the reports he gave of the hardships he underwent in reaching his destination may have tended to some extent to retard exploration in that quarter.

By 1750 the "Great American Desert" had been crossed in both its northern and southern parts. The activities of the Spanish had made at least a part of it familiar ground, but they were more or less familiar with its entire southern half. It is possible that they knew something of its northern extent for they
sooner or later must have heard of the work of the La Verendryes. Then the journey of the Mallet brothers would give them some idea of the northern extent of this territory lying to the north of New Mexico. Through the explorations of the Spanish gold seekers along the eastern base of the Rockies they would have still additional means of learning something of the extent of the region which later became the "Great American Desert". The French, too, had a general knowledge of the extent of the territory lying west of the Missouri river as far as the Rockies. It is reasonable to believe that they were rather familiar with the eastern edge of the "Great American Desert". They knew in a general way how wide the country was that lay between the bend of the Missouri and the Western mountains. The work of the younger La Verendrye had given the French some idea of the northern portion of the "Great American Desert", although a very indefinite one, and in a general way they knew the location of the Spanish settlements and posts which marked the south limits of this doubtful and vaguely known region.

It was not until after the opening of the nineteenth century that the Americans took any part in the exploration of the "Great American Desert". The vast territory lying beyond the Mississippi was virtually a terra incognita to the Americans in 1803 when Jefferson first suggested its investigation to Congress in a communication of January 18. Speaking of such a possible exploration Jefferson stated that "an intelligent officer, with ten or twelve chosen men, fit for the enterprise and willing to undertake it, taken from our posts where they may be spared without inconvenience, might explore the whole line even to the Western Ocean, having conferences with the natives ...
and return with the information acquired in two summers.¹

When we consider that the United States at this time was not even thinking of purchasing more of Louisiana than the island of New Orleans and a small hinterland about the city,² that the Treaty of Paris had not yet been signed ten years, and that Ohio had been a state less than a year, we can appreciate the magnitude of the undertaking the President was proposing. But the President carried his proposal through Congress and on February 28, 1803, An Act for Extending the Commerce of the United States was passed which appropriated $2500 for an exploration of the trans-Mississippi West.³

Meriwether Lewis, Jefferson's private secretary, and William Clark, younger brother of George Rogers, were selected by the President to lead the proposed expedition. A force of men were chosen and enrolled in the United States Army for performing this particular piece of work. After a rather thorough training the members of the expedition were sent to St. Louis where they spent the winter and the early spring before setting out on their tour of exploration.

In the meantime Louisiana had been purchased from Napoleon when that opportunist decided to give up his plan of a colonial American empire. Whether or not "in taking Louisiana we were the accomplices of the greatest highwayman in modern history"⁴ is not a part of this study. At any rate, on December 17, 1803, William C.C. Claiborne, acting for the United States,

¹ House Misc. Docs. 53rd Cong. 2nd Sess. XXXVII, 353. ² Annals of Congress, 7th Cong. 2nd Sess. 1566. ³ The first proposal that the United States purchase all of Louisiana was made by Talleyrand to Livingston on April 11, 1803. ⁴ Channing, The Jeffersonian System, 79.
received from the representative of France the province of Lower Louisiana. Upper Louisiana was not formally surrendered to the United States until March 9, of the following year. With this final transaction the major part of the "Great American Desert" became United States territory. As a result the proposed western expedition assumed new significance.

On May 15, 1804, Lewis and Clark set out on their long journey to the Western Ocean. Their instructions were long and varied. They were to pass up the Missouri river as far as its headwaters, then find a practicable pass through the mountains, and after finding some westward flowing stream, proceed down it to the ocean. Careful observations were to be made of the face and soil of the country, its vegetation, products, animal life, and climate. Journals were to be kept by each member of the expedition and the greatest caution observed for their safety.

Throughout the entire journey of the first year, 1804, which carried the explorers as far as the Mandan villages, near the present site of Bismarck, they found nothing but beautiful virgin land, covered with grass, upon which a large number of animals grazed. The only remarks in their journals which might lead one to think that the country through which they passed even resembled a desert are found in occasional references to the lack of timber, the impregnated condition of some of the springs, and the heat. As a matter of fact, both Lewis and Clark seem to have been very enthusiastic over the country which they saw between St. Louis and the Mandan country.

After wintering among the Mandan Indians, the expedition again resumed its western journey of exploration. The country through which they passed after resuming their advance seems, however, to have been much different in character from that which they had seen during the previous year. That lying immediately beyond the Mandan villages is described as "hilly and irregular with the appearances of glauber salts and carbonated wood, the low grounds smooth, sandy, and covered with cottonwood and small ash". The plains lying beyond the river are described as extensive, "of good soil but without timber or water".\(^1\) Three days later under entry of April 15, Clark observes, after having gone back some nine miles from the river, that the character of the country remains unchanged from that of the region lately traversed.\(^2\) From the same entry we learn that "like all the rivulets of this neighborhood, these drains are so strongly impregnated with mineral salts that they are not fit to drink".

"We passed three streams on the south, the first at a distance of a mile and a half from our camp was about twenty-five yards wide, but although it contains some water in standing pools it discharges none. This we called Little Dry river. About eight miles beyond, which is Big Dry creek, fifty yards wide, without any water; the third is six miles further, and has the bed of a large river two hundred yards wide yet without a drop of water."\(^3\) Such were the dry rivers that the party saw on May 6. It should be remembered that in the upper Missouri valley the months of April, May, and June are usually those of the greatest precipitation.\(^4\)

\(^1\) McMaster, ed., Lewis and Clark Journals, 1, 249.\(^2\) Ibid 253.\(^3\) Ibid 278.\(^4\) Monthly Weather Review 1924, tables of climatological data.
Under the entry of May 9, mention is made of an extraordinary river, also from the south, having a bed a half mile wide, or practically of the same width as that of the Missouri, but which discharged no water and contained nothing but a few standing pools. This river passed through a wide valley without timber, the surrounding country of which consisted of waving low hills interspersed with broad level plains. Beyond this large dry river the explorers found another smaller stream which was also perfectly dry. The soil of this region of dry rivers is described as a rich black loam near the bases of the hills, but in the hills proper as light brown in color, poor and sterile, and intermixed with coarse white sand. "Another small stream to the south, which contains a small amount of running water of brakish taste" is reported in the entry for May 17th. The next day another dry creek is reported which enters from the north. In the same entry we learn that the willows in a large measure have disappeared and even that the cottonwood is growing scarce. The game no longer is in abundance and the fish in the river are growing fewer. More dry creeks are mentioned in the entry for May 23. Commenting on the number of dry creeks the leaders observed that the water of these creeks must be absorbed by the thirsty soil long before reaching the main streams.

On May 24 the soil is described as being generally poor and productive of little grass. Game is actually growing scarce.

The climax seems to be reached when we read in the entry for May 26 that "The country has now become desert and barren ...
there is no timber except the thinly scattered pines and spruce ... The only animals we have observed are the elk, the bighorn, and the hare". From the leaders comes this statement of the desert like character of the country. Their enthusiasm for the Missouri valley earlier in the journey seems to have disappeared. The fine soil of the well-watered and luxuriant prairies has now given away to the poor sterile soil of the dry barren plains. At the time that this was written the expedition was perhaps twenty or thirty miles above the Musselshell river. Among the first Americans, then, to contribute to the notion of the "Great American Desert" were Lewis and Clark. Their published journals containing the description of the country between the Mandan villages and the Rocky Mountains from which we have just drawn, could only have impressed their readers with the fact that at least this part of the West which Lewis and Clark visited was probably a desert. In the same year that Lewis and Clark were returning from their exploring trip through the Missouri and Columbia valleys, a second expedition into the West was getting under way. In a communication of June 24, 1806, General Wilkinson notified the impetuous young Lieutenant Zebulon Montgomery Pike of his selection as commander of an expedition which he was about to send into the Missouri country. The ostensible purpose of this expedition seems to have been threefold: (1) to convey a party of Osage Indians from St. Louis to their homes; (2) to effect a per-

manent peace between the Kansas and Osage nations; and (3) to establish friendly relations between the Yanctons and the Comanches of the Southwest. It is generally believed that Pike also had secret instructions from Wilkinson; but the nature of these is largely a matter of conjecture.\(^1\) Pike was also to make observations of the geographical structure of the country through which he passed and to make a collection of botanical specimens. Instruments were provided for taking celestial observations so that the latitude and longitude of important points might be fixed.\(^2\)

Pike started from St. Louis on his expedition July 15, 1806, accompanied with a small force of twenty-three men. Attached to the party were a few Pawnee and Osage chiefs who were returning from a visit to Washington; there were also the Indian women and children who were being returned to their homes on the Osage. Pike followed the Missouri only as far as the mouth of the Osage, up which stream he proceeded to its headwaters. From the headwaters of the Osage he passed along the divide between the Kansas and Arkansas to the Smoky Hill river. From the Smoky Hill river he proceeded northwestward until he struck the Republican and then turned directly south to the Arkansas valley.\(^3\) While crossing the present Coffey County, Kansas, Pike wrote in his journal for September 8 of his party suffering from thirst.\(^4\) From September 8 to September 23 the party found the country through which they were passing, while enroute

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to the Solomon river, to be a dreary level plain, treeless and
with little water. 1 September 23 they encamped at sundown
near the Solomon after having "had great difficulty to find
water". 2 The next week Pike spent among the Pawnees 3 , and
likewise the first week of October. 4

The march was again resumed on October 9. On the 10th
the party had become separated while crossing the divide be­tween the Solomon and the Saline rivers. That night one party
"found water and wood but had nothing to eat", while the other
encamped on the prairie without food or water". 5 On the follow­
ing day Pike was informed by some wandering Indians that some
Spanish troops which had lately passed through the country had
been obliged to eat some of their horses for meat. 6 October 12
Pike writes in his journal of his mortification at losing the
trail of the Spanish troops which had lately passed through the
same country in which he found himself because "we had occasion
to believe that they had good guides, and were on the best
route for food and water". 7 On October 18 the party reached
the Arkansas near the present city of Great Bend, Kansas. 8 Lieu­
tenant Wilkinson who was with Pike had preceded him to the Ark­
ansas and had arrived there two days before. The water in the
Arkansas at the time of his arrival was only six inches deep
but because of rain which fell on the 16th and 17th the river
had raised somewhat. 9 Thus while Pike firmly believed that the
country was a desert, he was not unfamiliar with the fact that

1. Coues ed., The Expeditions of Zebulon Pike 399-409. 2. Ibid., 408
3. Ibid., 409-416. 4. Ibid., 417-420. 5. Ibid., 422. 6. Ibid., 423.
7. Ibid., 423. 8. Ibid., 427. 9. Ibid., 428.
rain sometimes feel on it. Describing the country about Great Bend to the south of the Arkansas, Pike refers to it as "a sandy sterile desert at a small distance". From October 18 to October 29 the party remained encamped near the site of Great Bend, Kansas. On the 28th Lieutenant Wilkinson with five other members of the party embarked in some rude boats which they built and began their descent of the Arkansas. The following day the rest of the party set out for the mountains following the course of the Arkansas.

No further reference to the country through which he was passing is found in Pike's journals until the entry for November 10 when the party was in the vicinity of Syracuse, Hamilton County, Kansas. On this day Pike wrote, "The hills increased; the banks of the river covered with ... cottonwood; the river itself much narrower and crooked. Our horses growing weak; two gave out; bring them along empty; cut down trees at night for them to browse on. Killed one buffalo". The next day Pike records in his journal his belief that the country lying further west will be almost devoid of buffalo upon which his party has been subsisting. He also states that he will accomplish every object of his expedition "even should it oblige me to spend (the) winter in the desert". "Nov. 12th. Was obliged to leave two horses, which entirely gave out". By November 21 Pike was in the eastern part of Pueblo County, Colorado. Here he observed that the Arkansas was as large, if not more so, "than some hundred miles below". This curious feature he attributed to "its flow-
ing through a long course of sandy soil, which must absorb much of (its) water". On November 24 the party was in the vicinity of the present site of Pueblo, Colorado. Here the explorers were "obliged to take up our nights lodging under a single cedar which we found in the prairie, without water, and extremely cold". For this study it will not be necessary to follow Pike through the mountains and his forced sojourn through Mexico.

Upon his return to the United States Pike published an account of his observations and his journal in a small volume which appeared in 1810. It is in this account that we find the best description of the trans-Missouri country as Pike saw it. In speaking of "these vast plains of the Western hemisphere," Pike draws upon his fancy when he observes "that they may become in time as celebrated as the sandy deserts of Africa". But when he states that he saw on his route in various places vast tracts "where the wind had thrown up the sand in all the fanciful forms of the ocean's rolling wave, and on which not a speck of vegetable matter existed", he was dealing with actual facts, in which he is substantiated by the observations and accounts of later explorers and travellers. We must smile at Pike's fanciful observation that a great good might arise out of this vast region of desert-like land, in that it would restrict population "to certain limits" and thereby insure a "continuation of the Union". But in a more significant observation Pike

states "that from the Missouri to the head of the (Little) Osage river, a distance in a straight line of probably 300 miles, the country will admit of a numerous, extensive, and compact population". Beyond this point, however, i.e. in the "Great American Desert", it appeared to him "to be only possible to introduce a limited population". In justice to Pike and to the region he was apparently condemning we must mention a further conviction of this explorer. This limited population of the desert, said Pike, will find it most to their advantage to pay attention "to the multiplication of cattle, horses, sheep, and goats, all of which they can raise in abundance, the earth producing spontaneously sufficient for their support both winter and summer". Whether in recommending grazing to those who might chance to settle in the "Great American Desert" Pike was drawing upon his knowledge of the Arabian and Sahara deserts is perhaps significant. At any rate no one can deny that this observation was other than a rational one.

 Probably the next visitor to the "Great American Desert" of some distinction was the English naturalist, John Bradbury, who accompanied Hunt's party of Astorians which left St. Louis for the mouth of the Columbia in March, 1811. When the expedition reached the present site of Omaha, Bradbury with two companions left the river and travelled overland to the mouth of the Platte where they rejoined their party. Bradbury says of the Platte that it is wide but shallow; that along its course there

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are but few trees, and that the land adjacent, while probably fertile, is generally dry.\(^1\) While in the Cannonball river region in the southwestern part of the present state of North Dakota, Bradbury writes in his journal of the ranges of low sand hills which are almost wholly devoid of any vegetation.\(^2\)

"I noticed a sensible change in the face of the country," he says, "after we had left the river. We now found some of the more elevated places covered with small stones and divested of herbage, and throughout the soil was of less depth and the grass shorter and more scanty.\(^3\) During the latter part of Bradbury's sojourn in the "Great American Desert" there was associated with him the English traveller, Henry M. Brackenridge, who had accompanied the fur trader, Manuel Lisa, up the Missouri. In various parts of his journal Brackenridge calls attention now and then to the lack of wood of any kind, the necessity of using buffalo dung for fuel, the scarcity of water, the scanty vegetation, and the eroded and barren character of much of the soil.\(^4\)

Bradbury's journal was published in London in 1816 but a statement in the publisher's notice to the effect that this volume would be useful to those who expected to emigrate to the trans-Missouri country would indicate that the publisher expected a demand for this volume in the United States.\(^5\) Brackenridge's journal was published at Baltimore in 1819.\(^6\) As the publication of Pike's journal and dissertation must have tended to lead people to believe that the southern part of the trans-Missouri country was a desert, so the appearance of the journals of Brad-

bury and Brackenridge must have tended to convince them of the truth of the implication left by Lewis and Clark that the northern part of this distant country appeared to be a desert.

During the summer and autumn of 1819 there was in the Arkansas river country, an English naturalist, Thomas Nuttall, who was exploring the region in the interest of natural science. On August 11, 1819, Nuttall set out with a guide from the post at the confluence of the Arkansas and Verdigris rivers with the Cimmaron as his objective. In his journal for August 12 he wrote that all the gullies and small streams were perfectly dry and that in the larger streams the water was "always stagnant, and often putrid". Travelling from ten to twenty miles a day through the valley of the Arkansas at some distance from the stream itself, Nuttall arrived at a point, about September 2, about twenty-five miles southeast of the Cimmaron and near the eastern edge of the arm of Oklahoma. His report of the country up to this point had been unfavorable, but when he reached the vicinity of the 100th meridian, which was later to be considered the demarcation line between possible and impossible arid conditions, it became even more so. By September 8 Nuttall was travelling through the valley of the Cimmaron river and on that day wrote, "I still continued my route along the beaches of the river, which proved almost insupportably hot, and I severely felt the want of fresh water, though it now, from necessity, became possible for me to swallow the tepid brine". He liked the valley, however, for its beauty, as "contracted with the broken and sterile country".

through which he had just passed.¹ His guide now told him that to the west there were "extensive tracts of moving sand hills, accompanied by a degree of sterility little short of the African deserts".² On September 10, while still in the same region, Nuttall states that he "could not help, indeed, reflecting on the inhospitality of this pathless desert which will one day perhaps give way to the blessings of civilization".³ Four days later he wrote that "fatigued with the sand beaches, as hot and cheerless as the African deserts", he left the river and after travelling through thickets for some distance which bordered the river, continued his homeward journey until night when he encamped "without fire, food, or water".⁴ Nuttall's journal was printed in Philadelphia in 1821.⁵ It was another bit of evidence tending to prove that the territory lying in the western part of the Louisiana purchase was a desert.

Stephen H. Long, who led a government expedition into the "Great American Desert" in 1820, has received particular attention for his alleged misrepresentations of the West which resulted in the false notion of a great Western desert. Long's party composed of twenty men, including Dr. Edwin James, the Chronicler of the expedition, left their winter camp near the present site of Council Bluffs, Iowa, in June, 1820, on their tour of exploration through the West.⁶ Their first march took them to the Pawnee villages on the Loup river through a region which James described as less pleasant, less abundantly supplied with game, and less fertile with each mile of their westward progress.⁷

¹ Thwaites, ed. Early Western Travels. 272. ² Ibid. ²72. ³ Ibid. ²74. ⁴ Ibid, ²76. ⁵ Ibid. ²1. ⁶ Ibid, XV ¹93. ²Ibid, ²00.
In conference with one of the Pawnee chiefs, Long was told that he would probably suffer from a lack of food and water after he had gone some distance farther west. Experience later proved the truth of the Indian's statement. "The country which we passed on the 14th lying between the Loup fork and the Platte has a moderately high surface ... The ridges are of little elevation, destitute of stone of any kind ... the soil is sandy and infertile. The high and barren parts of the tract are occupied by the numerous communities of the Prairie dog". They were on the Platte the next day and so short of food that they tried to kill some of the prairie dogs. On the same day James wrote, "In the middle of the day the heat was excessive and we were under the necessity of halting at a place where no shade could be found to shelter us from the scorching rays of the sun." To add to their difficulties of the day they were obliged to stand during the early part of the night and hold their tents from being blown away.

From "the monotony of a vast unbroken plain" through which they "had now traveled nearly one hundred and fifty miles" the party entered the Sand Hills region which crosses the Platte in western Dawson County, Nebraska. Here James found "on the summits of some of the dry sandy ridges ... a few of the plants called Adam's needles, thriving with an appearance of luxuriance ... in a soil which bids defiance to almost every other species of vegetation."

References:
numerous herds of buffalo. But the presence of buffalo did not change the opinion of James as to the desert-like character of the country. He observed that they must be passing southward in search of better grazing. However, he was familiar with the fact that in a later northward migration they would return to the Platte country but "what should ever prompt them to return to the inhospitable deserts" of this stream he did not know."¹ From the entry for June 23, written while still passing up the Platte, the following is taken, "The intense reflection of light and heat from the surface of many tracts of naked sand, which we crossed, added much to the fatigue and suffering of our journey. We often met with extensive districts covered entirely with loose and fine sand ... In the low plains along the river ... the soil ... is highly impregnated with saline substances, and too sterile to produce anything except a few stunted carices and rushes."² When farther up the Platte James writes on June 29 that the country presents the same "aspect of ... unvaried sterility" and that the cactus ferox reigns sole monarch, and sole possessor of thousands of acres of the dreary plain".³ James records an interesting mirage on the 30th which took the form of a herd of buffalo standing in a large pool of water.⁴

We will not attempt to follow the return of the expedition. It returned in two parties, one of which descended the Canadian and the other the Arkansas, and reunited at the confluence of

¹. Thwaites, ed. Early Western Travels. XV. 248. ²Ibid. 250. ³Ibid, 263. ⁴Ibid, 266.
these two streams. Both parties report similar desert-like characteristics along their respective courses. Both tell of the intense heat, the large tracts of barren sands, the lack of water, the dearth of vegetation, and of the depressing loneliness of the entire region.¹

In his final estimate Long expressed his opinion of the entire territory which he visited as "wholly unfit for cultivation, and of course uninhabitable by a people depending upon agriculture for their subsistence."² He believed that "the scarcity of wood and water, almost uniformly prevalent, will prove an insupportable obstacle in the way of settling the country. He, too, saw a possible good in this region as an effective barrier in restricting westward expansion."³ "We have little apprehension" said James, "of giving too unfavorable an account of this portion of the country. Though the soil is in some places fertile, the want of timber, of navigable streams, and of water for the necessities of life, render it an unfit residence for any but a nomad population. The traveller who shall at any time have traversed its desolate sands, will, we think, join us in the wish that this region may for ever remain the unmolested haunt of the native hunter, the bison, and the jackall."⁴ James' account of the expedition appeared in 1823 in a three volume work.⁵ Those who read this account of an expedition which had visited such a large part of the little known West and which fully substantiated the reports of Lewis and Clark, Pike, Bradbury, 

Brackenridge, and Nuttall, could hardly be expected to arrive at any conclusion other than that the territory lying beyond the Missouri was a desert.

There is some evidence tending to support that submitted by Dr. James and others, who early in the nineteenth century visited the Far West and pronounced it a desert, to be found in the Personal Narrative of James Pattie who accompanied a trading and trapping party across the "Great American Desert" from the Missouri to Santa Fe, by way of the Pawnee villages on the Platte, in 1824. His account, however, of this portion of his western travels and experiences is too summary to be of particular value.

A very definite contribution to the notion of the "Great American Desert" was made by Thomas Farnham, a young Vermont lawyer who was in the Far West in 1839. Farnham attempted to divide the trans-Mississippi country into geographical provinces. The first embraced a strip of territory 200 miles in width, extending up the Mississippi and including the present state of Iowa. The second included a second strip of 500 miles in width lying west of the first. The third province included the territory lying beyond the second province, or approximately the 100th meridian, and the Rockies. He fixed no definite northern or southern limits for these provinces. "The arid waste" of this third province, said Farnham, "is usually called the "Great American Desert". Farnham's description of the "desert" reminds one of Dr. James: "Its soil is composed of dark gravel mixed with

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Footnotes:
1. Thwaites, ed. Early Western Travels. XVIII, 37-82.
2. Ibid., XXVIII 28-39.
the sand. Some small portions of it, on the banks of the streams, are covered with tall prairie and bunch grass; others, the wild wormwood; but even these kinds of vegetation decrease and finally disappear as you approach the mountains. It is a scene of desolation scarcely equalled on the continent, when viewed in the dearth of midsummer from the base of the hills. Above, rise in sublime confusion, mass upon mass, shattered cliffs through which is struggling the dark foliage of stinted scrub-cedars; while below you spreads far and wide the burnt and arid desert, whose solemn silence is seldom broken by the tread of any other animal than the wolf or the starved and thirsty horse which bears the traveller across its wastes.¹ Farnham's two volumes on the West appeared in 1843.²

In 1843 there also appeared Father Pierre Jean De Smet's Letters and Sketches based upon his work among the Flathead Indians as a missionary.³ In a letter to an associate written February 7, 1841, De Smet describes his first journey into the Far West, which was made along the route of the Oregon trail, and gives an interesting description of the country through which he passed.⁴ The territory lying between the mouth of the South Platte and the mountains was a desert, said De Smet, which "seems to defy the industry of civilized man". De Smet thought that some of the land lying along the rivers might be cultivated and parts of it might be used for grazing, "But it is to be feared", he said that this immense region forms a limit between

civilization and barbarism, and that bands of malefactors, organized like the Caravans of the Arabs, may here practice their depredations with impunity. Is it not possible, asked De Smet, that the savages and social outcasts "may organize themselves into bands of pillagers and assassins, having the fleet horses of the prairies to carry them; with the desert as the scene of their outrages, and inaccessible rocks to secure their lives and plunder"?

In his Commerce of the Prairies, published in 1845, Josiah Gregg, the authority on the Santa Fe trade, devotes a chapter to the Geography of the Prairies. The Llano Estacado, or the Staked Plains of the Texas Panhandle, "embraces an area of about 30,000 square miles" says Gregg, "most of which is without water during three-fourths of the year". Gregg was told by the Mexicans that there was but one route across this table-land which could be safely used during the dry season; "and even some of the watering places on this are at intervals of fifty to eighty miles, and hard to find". Gregg describes the region about the headwaters of the Red as being one of hilly uplands, "which are for the most part sandy, dry and barren". The territory extending northwestward from the Red river to the western sources of the Missouri is said by Gregg to be "chiefly uninhabitable - not so much for want of wood (though the plains are altogether naked), as of soil and of water; for though some of the plains appear of sufficiently fertile soil, they are mostly of a sterile character, and all are too dry to be cultivated. These great

steppes seem only fitted for the haunts of the mustang, the buffalo, the antelope, and their migratory lord, the prairie Indian". There was no hope for this region thought Gregg, "unless with the progressive influence of time, some favorable mutation should be wrought in nature's operations, to revive the plains and upland prairies".¹ As Pike had believed, Gregg thought that grazing might be introduced on these Far Western plains in the vicinity of the watercourses, as had been done of the dry plains of northern Mexico.² The territory of the West lying approximately east of the 100th meridian is described by Gregg as being a fertile prairie country, and being handicapped only by a scarcity of timber and the absence of navigable streams.³

That the "Great American Desert" was to be seriously considered is to be seen when we read of the anxiety expressed in some of the Missouri valley newspapers during the summer of 1846, over the possibility that supplies could not be furnished the army of General Kearney while it was carrying on a campaign in northern Mexico. "Apprehensions are entertained at Fort Leavenworth," stated the St. Louis Republican on August 20, 1846, "that the requisite supply of provisions can not be forwarded to General Kearney".⁴ There were just causes for apprehension continued the Republican, "in view of the number of men going out, the difficulty of providing transportation, the amount of supplies indespensibility necessary for the subsistence of the troops, (and) the fact that teams can not cross the

¹ Thwaites, ed. Early Western Travels, XX, 248. ² Ibid. ³ Ibid, 249-50. ⁴ Niles Register, LXX, 402.
prairies from the 1st of October until about the 1st of April following". The apprehensions of the border must have been somewhat allayed when it was learned that "in a short space of 50 days" Kearney's Army had "marched nearly 900 miles, over a desert country, and conquered a province of 80,000 souls without firing a gun". This was the province of New Mexico, the capital of which, Santa Fe, was taken August 18, 1846.

Francis Parkman, the historian, made a trip through the Far West in 1846 and upon his return wrote *The Oregon Trail*, a volume which contains more evidence to indicate the existence of a Western desert. In crossing the plains from the Platte, at the point of its intersection with the Oregon trail, to Fort Laramie, three weeks were required by Parkman and his party. "During the whole of this time" states Parkman, "we were passing up the middle of a long, narrow, sandy plain, reaching like an outstretched belt nearly to the Rocky Mountains. Two lines of sand-hills, broken often into the wildest and most fantastic forms, flanked the valley at the distance of a mile or two on the right and left; while beyond them lay a barren, trackless waste, extending for hundreds of miles to the Arkansas on the one side, and the Missouri on the other. Before and behind us, the level monotony of the plain was unbroken as far as the eye could reach. Sometimes it glared in the sun, an expanse of hot, bare sand; sometimes it was veiled by long coarse grass." Of the Platte he says, it runs through the midst of this plain, a thin sheet of rapid, turbid water, half a mile wide, and scarce-

ly two feet deep. Its low banks, for the most part without
a bush or tree, are of loose sand, with which the stream is
so charged that it grates on the teeth in drinking". ¹

By 1860 there were many who had become familiar with the
"Great American Desert" because of having traveled across it
during some of the migrations to the West. While they must
have learned that the "Great American Desert" was not so utterly
a desert as they had previously believed it to be, nevertheless the old notion persisted. Proof of this, it seems, exists
in the fact that the "Great American Desert" did not begin to
settle up to any appreciable extent until twenty years later.
And this delay can not be explained by stating that the frontier
was neither in a position nor able to settle this region, for as
early as 1843 the movement to Oregon had begun. The Oregon mi-
gregation had been followed by the rush to California in 1849,
and the rush to the gold region of the Rockies after 1858.
If there were some who were beginning to believe that the
"Great American Desert" was to prove a myth, their belief must
have been shaken somewhat with the appearance in 1860 of an
Overland Journey from New York to San Francisco in the Summer
of 1859, which contained two chapters entitled The American
Desert and Good-Bye to the Desert respectively, and written
by no less a person than Horace Greeley. This volume is a
collection of letters written while Greeley was making his
western tour. On June 2 he wrote, while on the Republican in
the vicinity of the 100th meridian, that "for more than a hundred

miles back, the soil has been steadily degenerating, until here.... we seem to have reached the acme of barrenness and desolation".¹ For a distance of thirty miles east of the Republican he saw no trees and but one bunch of shrubs which were growing in a dry water-course". "The dearth of water is fearful," continues Greeley. "We have not passed a drop of living water in all our morning's ride". On the evening of June 3 he wrote: "Since I wrote the foregoing, we have travelled ninety miles up the south branch of the Republican ... In all these ninety miles we have passed just two living streams ... both together running scarcely water enough to turn a grind-stone... we have not seen wood enough to make a decent pigpen". Greeley thought that the country through which he was passing had less than a cord of growing wood to each township of land.² Summing up the desert conditions of the country through which he passed, "thus has it been for ninety miles - thus it is for many miles above and I presume many also below. The road from Leavenworth to Denver had to be taken some fifty miles north of its due course to obtain even such a passage through the American Desert; on a direct line from the head of Solomon's Fork, it must have passed over some two hundred miles of entire absence of wood and water".³

Greeley was not the last traveller in the Far West to call attention to its desert-like character. A traveller by the name of Hewitt, who visited the Far West in 1862, believed most of it to be a desert. While in the Upper Platte valley he found "the

¹Greeley, An Overland Journey, 98. ²Ibid, 103. ³Ibid, 104.
evidence ... abundant on every hand" that he was "well into
the Great American Desert of the geographies and atlases of
our school days". 1. Samuel Bowles was on the plains in 1865
and reported that the country grew more barren and the prickly
pear and the sage brush became more plentiful as he proceeded
westward. 2. Alexander Majors, a prominent early overland freight-
er, calls attention now and then in his Seventy Years on the
Frontier to the desert-like character of the plains beyond the
Missouri. General Pope of the Department of Missouri deals
with the geographical provinces of the West in his report of
February 25, 1866. The territory lying between the Mississippi
and the eastern boundaries of Oregon and California he divides
into three provinces: the first a rich agricultural region ex-
tending from the Mississippi to the 99th meridian, the second
a plains region extending from the 99th meridian to the Front
Range of the Rockies, and the third the remaining mountainous
district. The second belt, says Pope is the Great American
Desert and "consists entirely of high, arid plains, without timber,"
which "is beyond the reach of agriculture, and must always re-
main a great uninhabited desert. It is nowhere less than five
hundred miles in width from east to west, and extends from the
British possessions on the north to the Gulf of Mexico".

There were persons, however, who travelled through the Far
West at this same time who probably doubted the existence of
the supposed "Great American Desert". Bayard Taylor, the well-
known traveller, was such a one. In the summer of 1867 he made
a trip across the continent during which he paid particular at-

attention to this problem. While on the Smoky Hill route he wrote that he should not wonder "if the 'Great American Desert' should finally prove to be a myth". After having completed his journey and having had time to reflect upon his trip across the region of the supposed "desert" he wrote that he was "fast inclining toward the opinion that there is no American Desert on this side of the Rocky Mountains. Belts of arid and sandy soil there certainly are, but I doubt if any of these are more than fifty miles in breadth, while there are many points where an unbroken line of habitable territory may be followed from the Missouri to the base of the mountains".

As late as 1868, a traveller by the name of Beadle, after a rather extensive tour through the Far West, concluded that the major part of it was a desert. "Draw a line on longitude 100° (W) from British America to Texas" said Beadle, "then go 800 miles westward and draw another line from British America to Mexico, and all the area between these two lines - 800 miles by 1200 miles in extent, or in round numbers a million square miles - is the 'American Desert', a region of varying mountain, desert, and rock; of prevailing drought or complete sterility".

Beadle's conception of the Western desert then included that portion of the Far West which we have designated as the "Great American Desert". It is probable that later travellers than Beadle who visited the Far West referred to at least parts of it as a desert. But by 1870 the old notion of the "Great American Desert" had undergone such modification that their investigation does not belong to this chapter.

In the light of the evidence which we have just consid-
ered it seems that the early geographers were not wrong in plac-
ing the Great American Desert upon their maps, much as they have
been ridiculed for so doing. They were obliged to construct
their maps on the basis of the information which they received
from those who had visited the West, either in a private or
public capacity. Their error lay rather in its location and
in their failure to make note of the many important exceptions.
But again this was practically impossible with the incomplete
data which they were obliged to use. However, it seems that
they may well be pardoned for designating that portion of the
West, which extended westward from the 100th meridian to the
Rockies and lay between Canada and Mexico, as the Great American
Desert.

When the "Great American Desert" began to settle up about
1870, and it was demonstrated that its territory was inhab-
table, there arose a general belief that its climate had changed
and was still changing. It was believed that the precipita-
tion was becoming greater and more advantageously distributed
throughout the year; that the high velocity of the winds was
decreasing; and that the temperature was growing more equable.
Such a belief was natural. The people had long been taught,
and most of them had believed that rain seldom or never fell
on the "Great American Desert" and that nothing could be grown
upon it. Thus when they found, after living upon it, that rain
did fall, and that its soil was productive, they naturally at-
tibuted these facts to a change of climate, a belief in which
they were strongly supported by enterprising men who were
Chapter II.

The Climatological Basis for the Notion of the "Great American Desert".

In this chapter it is proposed to investigate the climate of the region of the "Great American Desert" in an attempt to learn what climatological basis there may exist in support of the original notion of the "Great American Desert". Since the data which must necessarily be used in this part of our study must be taken from comparatively recent records, it can not be applied to a study of the climate of the "Great American Desert" during the early part of the nineteenth century unless we can reasonably assume that this region has experienced no change in its climate during recent geologic history. This point, then, must first be determined.

When the "Great American Desert" began to settle up about 1860, and it was demonstrated that its territory was inhabitable, there arose a general belief that its climate had changed and was still changing. It was believed that the precipitation was becoming greater and more advantageously distributed throughout the year; that the high velocity of the winds was decreasing; and that the temperature was growing more equable. Such a belief was natural. The people had long been taught, and most of them had believed that rain seldom or never fell on the "Great American Desert" and that nothing could be grown upon it. Thus when they found, after living upon it, that rain did fall, and that its soil was productive, they naturally attributed these facts to a change of climate, a belief in which they were strongly supported by enterprising agents who were
interested in peopling the Far West.

This belief was first attacked, it seems, by W.E. Curtis, a newspaper correspondent, in a syndicate letter of July 5, 1905, in which he discussed the westward movement of the grain line. Beginning with 1860, he points out, the wheat line was to be found about 100 miles west of the Missouri state line, but by 1900 it had been extended into eastern Colorado, without irrigation. In 1869 old Fort Hayes was reckoned as the center of the "Great American Desert" and there, "to have imported a plow or sickle would have been a matter of public ridicule." However, by 1900 it was the center of a rich grain belt. Incidentally he mentions that it was only after repeated attempts that the soldiers at Fort Dodge were able to grow a garden. But these developments, says Curtis, have been possible not through any change of climate as is generally believed, but through improvements in agricultural methods. Curtis was later supported by W.L. Moore, Chief of the United States Weather Bureau, who appeared before the House Committee on Agriculture, January 8, 1907, to answer questions concerning the popular notion that the climate of the Far West had changed. Beginning with 1901 there had been six consecutive years of abnormally heavy rainfall which had led to a belief that the climate of the Far West had really changed. Moore assured the committee that such was not the case. He told them that the last few years of abundant rainfall would most certainly be followed by years of normally light rainfall and also by years of abnormally light rainfall. Moore admitted that the West was producing relatively more than ever before, but he emphati-
ally denied that it was the result of any supposed change of climate. Like Curtis, he attributed this fact to improved methods of agriculture. R.H. Sullivan, writing in the Agricultural Yearbook for 1908, concurrs with Curtis and Moore in their opinions as to any change of climate in the West. By the use of considerable data he shows with reasonable satisfaction that there has been no change in the climate of the West in recent geologic times. "It is the man that has changed," says Sullivan, "not the climate, and the face of nature has changed with efforts far exceeding those of the early Eastern pioneers. The Western man ... decries his own power when he charges to the account of climate the blessings resulting from his own initiation." It seems safe to assume that there has been no change of climate in the Far West in this present geologic age.

Before considering the climate of any region it is always well to know in a general way something of its topography. The region of the "Great American Desert" occupies the western part of the Great Plains Province, a large physiographic division embracing, as its name implies, the Great Plains. Among its subprovinces, the first includes the extreme northern parts of Montana and North Dakota, a region of old glaciated plateaus and low isolated mountains. West and south of the Missouri river is a second subprovince extending roughly to the northern boundary of Nebraska; it is an old worn down plateau and characterized by local bad lands. Within the second subprovince is a small third subprovince.

1. Agricultural Yearbook, 1908, 289-300
which includes the Black Hills. South of the second subprovince and including all of western Nebraska is a fourth subdivision known as the High Plains which lie approximately between the eastern edge of the region of the desert and the 103rd meridian and extends southward to the Pecos river. This subprovince is all that remains of the regular fluvatile plain which once included all of the Great Plains Province. Practically all of eastern Colorado is included in the Colorado Piedmont, a high dissected fluvatile plain. Northeastern New Mexico comprises a small subprovince of high trenched penneplain surmounted by dissected, lava-capped plateaus and buttes. Southeastern New Mexico and the valley of the Pecos river comprise the last subprovince of the Great Blains Province. It is composed of submature to mature plateaus. Lying outside the Great Plains Province, and yet included in the region of the "Great American Desert" is a small part of that subprovince of the Basin and Range Province known as the Mexican Highlands, a region of isolated ranges separated by agraded deserts. The extreme western portion of Texas and the western portion of that part of New Mexico included in the region of the desert are included in this last named subprovince. A considerable portion of the Wyoming Basin, a large area of elevated plain, lying for the most part in central Wyoming, is also included in the region of the "Great American Desert."  

One of the most important topographical features of the region of the "Great American Desert" with respect to influ-

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ence on climate is the existence of the great mountain systems west of it. This important factor, together with the peculiar topography of vast plains, often quite regular, again distinctly irregular, in either case broken by great gentle divides, escarpments, and low mountains are responsible for the many complexities and peculiarities of the climate of this comprehensive region.

Since it would be impossible to discuss fully the climate of the entire region of the "Great American Desert", it is necessary to take some small portion of it as a type for a rather detailed consideration. For this purpose northeastern Colorado probably furnishes as good a type as any that might be selected. Let us first consider rainfall. Northeastern Colorado's rainfall is to be traced to the cyclonic and anticyclonic storms which move across the entire country from west to east. During the first five months of the year many of these storms enter the United States in the region of Puget Sound and move southwestwardly as far as the 30th parallel at the longitude of eastern Colorado. When one of these cyclonic storms or lows passes over northeastern Colorado a certain amount of moisture is precipitated, since precipitation nearly always occurs at the center of a low because of the low barometric pressure and high relative humidity. But these lows have little moisture to precipitate for in crossing the three mountain systems between eastern Colorado and the Pacific they are robbed of most of their moisture; moreover, they are too far inland to draw upon the moisture laden air from the Gulf of Mexico. From January to June as the belt of equatorial
heating moves northward the course of the storms also moves northward which brings more of the lows across northeastern Colorado. The temperature is also increased and likewise the humidity. Thus the amount of precipitation rises during this period. The normal monthly precipitation is about .45 inches for January; .70 for February; 2.25 for April; and 2.25 for May.

There is a slight decrease in precipitation during June caused by the storms moving north of this region, although not far enough north to develop the regular summer storms. During the summer months the rainfall is quite variable; there may be a large or small amount. As much as 7.00 inches and as little as less than .01 inches has been recorded in the South Platte valley for each month of the summer. The summer rainfall results from a combination of two factors; the anticyclones or highs passing north of this region and the existence of a permanent area of low pressure during the summer in the Southwest. Thus when a high passes north of this region a movement of air from the north or northeast sets in across it toward the southwest and as it climbs the divide between the South Platte and the Arkansas, precipitation follows. This furnishes a good illustration of the influence of local topography on rainfall.

the normal monthly precipitation is about 2.00 inches for June; 2.25 for July; 2.10 for August; and about 1.70 for September, which is another month of transition. Rainfall for October, November and December corresponds quite favorably with that for March, February, and January respectively. This makes a total average annual rainfall of 16.85 inches. To be more nearly
correct it may be stated that the normal amount of rain- 
fall for northeastern Colorado varies from 14.00 to 21.00 
 inches according to the local topography.

The annual mean temperature of this region ranges from 
48° to 51°, varying somewhat with different localities. The minimum temperature varies from 29° to 32° while the maximum mean temperature varies from 68° to 70°. Great extremes of temperature are to be expected in this region of topography of such regularity and in the midst of a great land mass. Colorado is a veritable crossroads for both cyclonic and anticyclonic storms; it is in itself a breeding ground for storms. Thus with many storms moving easily across this region, with highs following lows in quick succession, it is not infrequent that temperatures change from 30° to 40° in twenty-four hours and from 60° to 70° in a few days. For the year the prevailing winds are from the northwest in winter and from the south or southwest in summer. It will be noted that the direction of these winds seems to be contrary to what has just been said in considering rainfall. This is explained by the fact that anticyclonic influence is greater than cyclonic influence in the winter months while in the summer months the opposite is true. Humidity is comparatively low for northeastern Colorado. Denver reports an annual mean humidity based upon a record for twenty-eight years of 63 and 42 at 8:00 A.M. and 8:00 P.M. respectively. Cheyenne, Wyoming, closely adjacent to this region, reports an annual mean humidity based upon a record for twenty-seven years of 63 and 45 respectively. The percentage of possible sunshine is high; for Denver it is 67 and for Cheyenne 65.
In a general way it may be said that all parts of the region of the "Great American Desert" have a climate more or less similar to that of northeastern Colorado. Precipitation throughout is uniform to a considerable extent; it shows a uniform increase toward the east in all latitudes. Seasonal rainfall in the north corresponds favorably to that of the central and southern latitudes. About the same ranges in temperature are experienced throughout the region of the "Great American Desert" and there are marked similarities in humidity and sunshine. In the following table the similarity of the climate of the various portions of this large region will be noticed. The essential purpose of this table, however, is to furnish climatological data for reconstructing actual climatic conditions as they existed when this region under consideration was believed to be the "Great American Desert".

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<td>72.9</td>
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<td>63</td>
</tr>
<tr>
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<td>74.2</td>
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<td>Dodge City, Kan.</td>
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<td>Amarillo, Tex.</td>
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<td>74</td>
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<tr>
<td>Albuquerque, N.M.</td>
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<tr>
<td>El Paso, Tex.</td>
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<td>62.9</td>
<td>80.5</td>
<td>44.1</td>
<td>78#</td>
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Note: The above data, like all data used in this chapter, has been compiled from records of the U.S. Weather Bureau for periods not shorter than thirty years. (#) Estimated from incomplete data.
From the foregoing table it can be seen that the entire region of the "Great American Desert" is deficient in rainfall and that practically all of it may be spoken of as semi-arid since it has less than 20.00 inches annual precipitation. As is suggested from the above data, the Pecos valley and practically all of eastern New Mexico has less than ten inches annual precipitation and thus comprises a region bordering on desert conditions as deserts are defined at the present time.  

1. Seventy-five per cent of Wyoming has an annual precipitation of from 10.00 to 15.00 inches while approximately one eighth of the state, which is to be found within the region of our investigation, has less than 10.00 inches.  

2. Much of the upper Arkansas valley has an annual precipitation of slightly more than 10.00 inches. The temperatures in the above table should be supplemented somewhat in order to better understand the climate of the region of the "Great American Desert" as those who crossed it in the first half of the century found it. The mean maximum temperatures for May, June, July, August, and September of 1910 at Wray, northeastern Colorado, were 70.5, 85.5, 93.8, 86.5, and 81.6, respectively. The same for 1913 were 77.5, 84.8, 92.6, 96.5, and 78.0. Similar data for North Platte, western Nebraska, for 1910 is as follows: 66.9, 81.5, 89.6, 83.2, and 78.2; for 1913 78.0, 82.3, 88.3, 93.0, and 76.0 respectively. With mean maximum temperatures as high as these it is easily seen that daily temperatures of 100° and more can not be infrequent occurrences throughout this region which the early visitors reported to be a "desert".
It must be remembered that most of the explorations in the region of the "Great American Desert" were conducted during the late spring and summer months when the rainfall is the heaviest and thus when they dealt with the amount of rainfall in their reports they had the opportunity of judging it with every advantage to the region. But it is not strange that the early visitors to the Far West spoke disparagingly of its rainfall. Two inches and a half of rainfall, or even twice that amount, could make but little impression on this region. In the first place it probably all fell in two or three showers, as is characteristic of summer rainfall throughout the Far West, while the other twenty-seven or eight days were perfectly clear. Since the rain fell in sudden dashing storms the run-off was great; what might not have been accounted for by the run-off was quickly absorbed by the thirsty soil. But even the moisture that the soil might have absorbed was soon lost in the equally thirsty atmosphere. Early visitors tell of water standing on the ground after one of these storms but they also tell of its disappearance as if by magic. When those who first traversed the region of the "Great American Desert" reported the scanty rainfall, streams without water, and their inconvenience, sometimes actual suffering, because of a lack of water, it is not unreasonable to believe that they were reporting actual conditions. Moreover, it is not unreasonable to believe that when these same persons reported the excessive heat which they were obliged to endure, they were dealing with actualities. The heat must have been even more noticeable then than now for the radiation

must have been greater because of a more scanty vegetation.

So far we have dealt with normal conditions in our attempt to reproduce the climate of the "Great American Desert". Abnormal conditions should also be considered. In a region of semi-aridity, while there may be occasional floods, there are never periods of excessive rainfall entailing general damage and loss. On the other hand, a deficiency in the normal amount of rainfall becomes at once a serious situation, and seldom fails to cause serious damage and loss. The longest drought in the United States, so far as there is any record, occurred during the years 1859-60 over the entire West and was particularly severe in the "Great American Desert".1

Beginning with September, 1859, and continuing until October or November 1860, only two or three light showers fell, varying with the locality, and practically no snow fell during the winter. During the summer of 1860 the temperatures stood between 110° and 114° for weeks. So severe was it that only a few trees survived while all other vegetation entirely disappeared. Water threatened to disappear entirely from the stricken area. From 1888 to 1917 inclusively, a period of 39 years, there occurred droughts of varying seriousness in ten of them: 1888, 1893, 1896, 1901, 1909, 1910, 1912, 1913; 2 1916; and 1917. 4 The drought of 1913 was particularly severe and the entire Great Plains region suffered. 5 The drought in Kansas alone resulted in the loss of 150,000,000 bushels of corn, and caused a loss in Nebraska of 80,000,000. 6 The total

reduction of the corn crop this year as compared with 1912 is estimated at about 750,000,000 bushels, the greater portion of which was sustained by the states of the middle West.\(^1\) Temperatures of more than 100° were common from South Dakota to Texas; many of 110° or more were recorded, while the maximum was 117°. The streams were practically dry. The volume of the Arkansas at Fort Smith, Arkansas, was reported the smallest in years. The seasons of 1916 and 1817 were deficient in rainfall throughout the West but in the Southwest they were unusually dry. So deficient was the amount of range feed as a result that the hard-pressed stockmen were forced to feed sotol, soap weed, and other desert plants to their stock during the extreme shortage of other feed.\(^2\) As this was being written in May, 1925, eastern Colorado was suffering from a period of deficient rainfall which began nearly a year before and which was one of the severest in recent years. As indicative of the small amount of rain which may fall over the region of the "Great American Desert" are the low water levels of the Arkansas during 1910 and 1911. At Little Rock, Arkansas, which is nearly one thousand miles from the source of the Arkansas river, stages of less than twelve inches were recorded during both years, the lowest in the recorded history of that stream.\(^3\)

Assuming now that we have some conception of actual climatic conditions as they existed when the Far West and the "Great American Desert" were almost synonymous terms, can it

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be said that the "Great American Desert" was actually a desert? Richard E. Dodge, emeritus professor of Geography, Columbia University, writing in the Bulletin of the American Geographical Society for December, 1902, called attention to the fact that "no hard-and-fast lines can be drawn between deserts and non-deserts. Bordering a desert where the rainfall is less than ten inches a year there is naturally a region where the actual amount may vary within a considerable range". Such a region, the rainfall of which varies between ten and twenty inches a year, may be rightly called semi-arid and constitutes a grass or steppe region. J. C. Alter, an observer for the United States Weather Bureau, writing in the Monthly Weather Review for December, 1910, makes a similar distinction between a desert and a non-desert. Since only a very small portion of the region of the old "Great American Desert" has a rainfall less than ten inches while, for the most part, throughout the entire region the rainfall varies from ten to twenty inches, it must be concluded that the Old "Great American Desert" was not a desert but rather a grass or steppe region which in certain years and at certain seasons took on many of the aspects of the true desert.

Chapter III.

The Influence of the Fur Trade, Early Transportation and Emigration, the Gold Discoveries, and Ranching, Upon the Occupation of the Supposed "Great American Desert".

A consideration of the gradual development which occasioned the occupation of the supposed "Great American Desert" will reveal five distinct epochs: the fur trade, the period of transportation and emigration over the Santa Fe and Oregon trails, the gold discoveries, ranching, and agriculture. In this chapter the first four of these will be considered in relation to their respective contributions to the conquest of the "desert".

Throughout the entire history of North America the fur trade has played an important part. It was the desire for new fields of enterprise on the part of the fur traders and trappers that played a significant part in extending the American frontier. The frontier having been extended, it owed much of its maintenance to the value of the fur trade which it exploited. The prosecution of the fur trade was thus an important factor in binding the new settlements with the older ones. As the fur trade had been an important factor in extending the American frontier into the Ohio and Mississippi valleys, so it was to prove an important factor in

1. Flagg, The Far West, Thwaites, Early Western Travels XXVI, 143. 2. Cumming, Sketches of a Tour to the Western Country (1807-09), Thwaites, Early Western Travels, IV, 299; 353.
extending the frontier into the Missouri valley and the "Great American Desert".

While a few St. Louis traders and trappers, as well as a few Canadians, had operated along the Missouri river for several years before the time of Lewis and Clark's expedition, it was not until after the return of this party, 1806, that much activity on the part of the Americans in the possibilities of the Far Western industry was manifested. In 1807, Manuel Lisa, probably the most outstanding individual in the Western fur trade, made a successful venture in fur trading on the upper Missouri. The following year Lisa organized the Missouri Fur Company which did a good business until its dissolution in 1830. It performed an important work in that it opened up in a large way the fur resources of the Far West to the Americans. Since it was the first in the field and ever aggressive, this company is important for the work in exploration which it performed.

Second in point of time of the powerful Western fur companies was the Rocky Mountain Fur Company which was organized by William H. Ashley in 1822. Among his associates were Jedidiah Smith, William Sublette, David Jackson, and Jim Bridger, all of whom are famous in the history of the fur trade.

The first expedition of this company, 1822-23, is deserving of particular attention for its discovery of the South Pass and the Great Salt Lake, and its exploration of large areas of hitherto unknown territory. Two years later Ashley led a second expedition of the company which explored the Green river valley and the valley of the Great Salt Lake during the course of its operations. A third expedition of the company to the Far West in 1826 travelled overland by a route which later was to become the Oregon Trail. It was in this same year that Smith began his tours of exploration which carried him to California and back on two different occasions. Under the rendezvous system which this company developed, small parties of trappers were sent out independently of one another for a year's trapping. Once a year these independent parties met at the annual rendezvous to deliver their year's catch of furs and to receive another year's supplies. With this system in use it is obvious that all of the northern half of the western edge of the "Great American Desert" must have become more or less familiar ground to the lonely trappers and traders at an early date.

In 1832 a change was developing in the fur industry of the Far West. The field was no longer restricted to the Rocky Mountain Fur Company alone. There had come in the powerful Opposition of the American Fur Company. Two Easterners,
Nathaniel Wyeth, and Bonneville, had entered the field backed by Eastern capital. The trappers and traders of the Hudson Bay Company were able to share the fur country with their American rivals. "The old order of things was gone. Henceforth there was to be bitter opposition". ¹ What little territory in the Far West above the 37th parallel which was not well known would little longer remain thus for the period of greatest activity in the history of the American fur industry was at hand.² The latter history of the fur industry is marred by the sordidness occasioned by the bitter rivalry among the different groups engaged in the trade.³

How extensive the fur trade was may be seen from the number of posts which it employed throughout the Far West. Chittenden fixes their number "in the country tributary to St. Louis," in 1843 at "no fewer than one hundred and fifty, occupied or abandoned."⁴ These posts were scattered from Fort Union⁵ on the north to Bent's Fort⁶ on the south; and from the Rocky Mountains eastward to the Missouri. In these fur trading posts were the outposts of a civilization that was to follow a quarter of a century later. Of necessity these posts made the laws of the fur country, and assumed responsibility for their administration.⁷ Parkman, writing of Fort Laramie in 1846, says, "Here its officials rule with absolute sway; the arm of the United States has little force; ....the extreme

outposts of her troops (are) more than seven hundred miles
to the eastward.\textsuperscript{1} The annual value of the trade which these
posts carried on is estimated by Chittenden at a quarter
million dollars.\textsuperscript{2}

An important contribution of the fur trade was the devel-
velopment of interest in the Far West. Congressional action
from 1796 to 1832 in regulation of the fur trade turned atten-
tion to the western edge of the "Great American Desert".
The popular mind was turned to the West in the thirties by
the rise of the first American monopoly in the American Fur
Company. Eastern capital which was invested in the fur in-
dustry naturally provoked interest in the region, in which
it was invested. Lastly there was the factor of romance at-
tached to the industry which intrigued the interest of all
classes of people and, as Flint points out in his History and
Geography of the Mississippi Valley (1832), was a considerable
factor in promoting the western migrations.\textsuperscript{3}

"Profound and far reaching," says Chittenden, "was the influ-
ence of the fur trade upon the destiny of the Indians".\textsuperscript{4} While
the traders and trappers brought them the white man's vices,
they also brought them their first lessons in the life they
were to lead. Fairness toward the Indians for the most part,
close association, and a fairly extensive intermarriage during
the regime of the fur trade resulted in a positive mutual un-
derstanding and sympathy between the two races, a situation

which unfortunately was not to be maintained with the coming of the immigrant.\footnote{1} It was the fur trade which produced the real pathfinders of the West; the later Government explorers who depended on the old traders and trappers for guides can not be said to have been the real pathfinders. In his ninth edition of the \textit{Navigator} (1817) Zadock Cramer gives the credit to the traders and trappers for what little there is known of the Upper Missouri. The fur traders and trappers marked the early routes across the plains and mountains; they gave to the world the first extensive information concerning the trans-Missouri West; they selected some of the sites of its future towns and cities; in short, they did much of the rough preparatory work in the conquest of virtually a new empire.

Contemporary with the development of the fur trade in the western part of the "Great American Desert" was the development of transportation and commerce, or the Santa Fe trade, in its southwestern portion. This frontier commerce was carried on between the Americans, who operated from the region of the great bend of the Missouri, and the New Mexican towns, particularly Santa Fe from which the trade derives its name.\footnote{2} The first recorded attempt in this trade was made by an Illinois merchant who sent an agent by the name of La Lande to Santa Fe in 1804.\footnote{3} A second attempt to open up trade with Santa Fe was made the following year by one named Pursley.\footnote{4} These two attempts are important only in that they are believed to be the first made by Americans. Pike deserves some credit for opening this trade, for

\begin{itemize}
  \item \footnote{1}{All of the authorities which I have been able to investigate agree that during the fur trade relations between the whites and Indians were on the whole commendable.}
  \item \footnote{2}{For a map of the trail see Hart and Bolton, \textit{American History Atlas}, Map A13.}
  \item \footnote{3}{Coues ed., \textit{The Expeditions of Zebulon M. Pike}, II, 500.}
  \item \footnote{4}{Ibid II, 757.}
\end{itemize}
in his own account of his expedition in the Southwest, 1806-07, he suggests that a profitable trade might be opened with New Mexico. However, without Pike's influence the trade would have been opened although it might have been delayed. A very successful expedition was made to Santa Fe in 1812 by one known as Captain Becknell and is believed to have been responsible for the increased interest and activity which followed.

By 1825 occasional trips to Santa Fe made only by pack train had been replaced by a fairly regular traffic which employed wagons as well as pack trains. The extent of the trade had also undergone a change for its value for 1825 was estimated by Storrs, one of the traders, at $180,000; probably a more nearly correct estimate of the value of the trade for this year is that of Gregg who fixed it at $65,000. The development of the trade from 1825 to 1831 continued and its value for this period is placed by Gregg at $505,000.

In 1843 the trade was temporarily cut off by the Mexican Government because the Government feared that the extent of the trade was becoming so great as to threaten its authority on the northern border. The Mexican Government probably had good reason to be alarmed for the value of the Santa Fe trade from 1831 to 1843 was estimated at $2,290,000.

With the settling of the lower Missouri valley early in the nineteenth century the most western salient of the frontier

had been brought into proximity with the "Great American Desert". Contemporary with this westward thrust of the frontier was the rise of the Santa Fe trade. In this trade the settlements at the great bend of the Missouri found a good home market for their agricultural produce, and their mules and oxen. From 1831 to 1846 Independence, Missouri, one of the outfitting points of the Santa Fe trade, was next to St. Louis, the best market for cattle, mules, and oxen in the West. The Santa Fe trade was thus directly responsible for the prosperity of this part of the frontier. Since the frontier at this point was prosperous it was able to grow sufficiently strong and stable to support its slow westward advances of the next few decades. The Santa Fe trade is of further importance for its part in the Mexican War. It had made the Americans familiar with the route across the southern plains which the United States forces must take in order to prosecute the war in northern Mexico. Moreover, the commercial intercourse of a quarter century had made the New Mexicans acquainted with the Americans and had done much in promoting a mutually friendly feeling. As a result their change of allegiance was easily effected when the portion of the "Great American Desert" which they inhabited was transferred to the United States in 1848.

After New Mexico became a part of the United States the trade with Santa Fe continued to prosper until about the close 1. Inman, The Santa Fe Trail, 144. 2. Bradley, The Story of the Santa Fe, 33. 3. Paxson, "The Pacific Railroads and the Disappearance of the American Frontier" Report of American Historical Association, 1907-08.
of the Civil War when it rapidly declined and finally ceased altogether. This was occasioned by the opening of new routes of communication with other portions of the West and by the building of railroads. More important than the trade after 1848 was the immigration into New Mexico over the Santa Fe trail. Colonel Gilpin, who became Colorado's first Governor, wrote from Fort Mann, August 1, 1848, of the heavy immigration that was settling in New Mexico. Inman also calls attention to the hundreds of people who were moving into this new territory after the close of the Mexican War. The movement was hampered, however, at different times by the Indians who were not subdued until after Sheridan's campaign of 1868. But the extent of the New Mexican immigration was considerable, as can be seen from the following statistics. The Census of 1850 gave New Mexico a white population of 61,547 and a property valuation of $5,274,000. By the Census of 1860 this population had increased to 82,979 while the property valuation had increased to nearly $21,000,000. With the construction of the Kansas Pacific in the early sixties and the Atchison, Topeka, and Santa Fe in the seventies there was ushered in a new era in the development of the lower half of the "Great American Desert".

Of importance in the final occupation of the "Great American Desert" was the transportation and emigration over the Oregon trail which occurred before the gold discoveries in the Rocky Mountains in 1858. This trail had been known

to the fur traders and trappers and had been used by them in the carrying on of their industry. As early as 1830 wagons had been used upon it and as a result much of it was well marked. Before 1843, the year of the first important migration to Oregon, a few persons had gone to the Northwest because of various motives. Beginning, however, with 1843 there began a series of migrations over the Oregon trail which first carried a considerable population into Oregon, then the thousands of gold seekers to California, and also the Mormons into the valley of the Great Salt Lake. Colonel Gilpin who accompanied the party of 1843 to Oregon sums up their experiences in the following: "after having braved and overcome unparalleled dangers and difficulties from savages, from thirst, from hunger, crossing parched treeless plains" and almost impassable country, the party of emigrants at length reached their destination. By 1850 the migration to Oregon had given it a white population of 13,087 which increased to 47,219 by 1860, according to the Federal Census. Far surpassing in extent the Oregon migration was the California migration of 1849-50. The St. Joseph Adventurer of May 18, 1849 stated that "The number now on the plains that have crossed the Missouri at St. Joseph, Council Bluffs, and intermediate ferries (is) 4356 wagons, 17,400 men, and 34,800 oxen". Stewart Edward White estimates the number of emigrants who started across the plains in 1849 to California at 50,000. The Census credited California with a white population in 1850 of 91,635, half of which we may safe-

ly say reached there by the overland route. After the gold rush the migration to the Pacific slope did not cease. Ezra Meeker's party while halted on the Oregon trail during their trip to the Pacific slope in 1852 counted 1600 wagons and 8,000 men, women, and children pass them in the space of four days. The most conclusive evidence that the migration continued from 1850 to 1860 is to be found in the Census reports. California's population had increased by 1860 to 229,831. The Mormon migration by 1850 had placed a population of 11,330 in the Great Salt Lake Valley. Stansbury, a United States Army officer, reported in 1853 after having made a careful observation of the Mormon settlements that the Mormon population was increasing. That Stansbury was right is seen in the Census report of 1860 which credits Utah with a population of 27,460. By 1860 Nevada is also to be considered, it having a population then of 4,752.

With the exception of the fur business there was little commerce over the Oregon trail and little transportation save that of the migrations. In the latter period of these migrations some additional transportation developed because of the necessity of supplying the Army posts which had been built along the trail for the protection of the emigrants. This amounted to 16,000,000 pounds in 1856 and yielded a profit to the contractors of $350,000.

The Western migrations were of importance to the Western frontier at the great bend of the Missouri because of the pros-

perity which they brought it. It was at the great bend that the parties outfitted for the trip across the plains and as a result the frontier grew prosperous, the importance of which we have already noted. Then there were many who returned from Oregon and California, particularly the latter, and remembering some favored spot on the plains which they had passed, planned to settle there. Thus the migrations did much to dispell the old notions of the "Great American Desert" and led either directly or indirectly to the westward extension of the farmer's frontier. The transportation and communication over the Oregon trail did for the northern portion of the "Great American Desert" what was similarly done by means of the Santa Fe trail for its southern part.

Third among the epochs in the process of settling the region of the "Great American Desert" is that of the early gold discoveries in the eastern foothills of the Rocky Mountains. That gold was present in this region was known to the Spaniards about 1600;¹ by the French a century later;² and by the Americans early in the nineteenth century.³ But as Gregg says, while "Gold has been found no doubt in different places (in the Rockies) ... it is questionable whether it has anywhere been discovered in sufficient abundance to render it worth seeking".⁴ In the spring of 1858 there came new reports of gold in the Rockies and when it was learned that two

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reports were accepted as authentic. 1 Excited by rumors of
the richness of this new discovery a few eager persons hur-
ried to the mountains during the same year. 2 Despite the
fact that no gold discoveries of importance had been made,
the winter of 1858-59 found a few people in the future
state of Colorado and saw the founding of the present cities
of Denver, Boulder, and Pueblo. Some five or six town compan-
ies were organized by the enthusiastic people who already
felt assured of the future greatness of the region in which
they were settling. In November 1858, these original Colo-
radoans chose a representative to the Kansas Territorial
Assembly, under whose jurisdiction they were, and also sent
a man to Washington to promote their best interests. 3 The
first attempts at local civil government in the present state
of Colorado were also made during this same winter.

In explaining the gold rush to the Pike's Peak country,
as the new gold region was known, two factors may be consider-
ed. The first of these was the spell of the gold rush to
California only a decade before which still lingered and
needed only rumors of new discoveries to restore it to its
original potency. The second was the financial ruin which
thousands had suffered as a result of the Panic of 1857. The
new gold country offered an opportunity, it was believed,
to those whose fortunes or savings had been lost for making
a new start. So impelled by these two factors, although un-

in 1858", *Diary of David Kellogg, The Trail*, V, nos. 7 and 8.
acquainted with the actual situation in the reported gold country, literally thousands prepared to set out for the mountains in the spring of 1859 as soon as the weather would permit. Thus W. T. Sherman could write from Fort Leavenworth, April 30, 1859, that the region about his post was the scene of great activity because of the rush to the Pike's Peak gold fields and that 25,000 had already started for the mountains.¹ Probably one hundred thousand people made their way to the Rockies in 1859.² But most of this large number of people returned the same year for gold in sufficient quantities to warrant digging for it was not discovered until after the earlier immigrants had returned home from disappointment.

Even with the really important discoveries of the late spring of 1859 there were many it seems who returned to their Eastern homes before the winter set in. Despite the large number of would-be gold miners that did not remain in the new gold country, enough remained to practically insure the permanence of the new settlements on the western edge of the supposed "Great American Desert".

Rich gold discoveries were made in 1862 and 1863 at the eastern base of the Rockies in the present state of Montana.³ As soon as news of these discoveries got abroad it was but a short time until there was a rush across the plains of eastern Montana to the new fields. About the diggings towns quickly sprang up as they had sprung up in Colorado. Thus a second

¹ Part of letter in Paxson, *The Last American Frontier*, 144.
² Ibid. ³ Langford, *Vigalantee Days and Ways*, is a good account of the early days of Montana history written by an early pioneer.
new group of settlements was to be found on the western edge of the "Great American Desert" by the middle of the sixties. While settlements were being established in the present states of Colorado and Montana there developed no activity in the territory lying between for the simple reason that gold was not found there in paying quantities. It was not until July, 1868, that it was organized as the Territory of Wyoming, or seven years after the organization of Colorado Territory, and four years after that of Montana Territory. But even in Wyoming the discovery of gold in the Rockies played at least an indirect part in that it hastened the settlement of the entire Far West.

The Civil War hardly affected Montana because of her isolation and the newness of her gold discoveries but it seriously affected Colorado. Her population declined, immigration stopped, while she was ravaged by a serious Indian war. But by 1866 with the Civil War over and the nation returning to normalcy Colorado's future looked brighter, for the Indians could now be subdued by soldiers released from the South, the gold fields would again attract immigration, and population increase. Montana, too, might expect an increase in population for her mines were reported richer than those of Colorado. Then there was little reason to believe that New Mexico would not receive its stream of immigration which had set in at the close of the Mexican War. The growth which the settlements on

the western edge of the "Great American Desert" might have ex­
pected after 1866 probably did not meet their expectations for 
by the Census of 1870 Montana had a white population of only 
18,036 while Colorado's white population had increased from 
31,565 during the decade to but 39,221. New Mexico's white popu­
lation of 82,979 in 1860 increased to 90,393, exclusive of Arizona, 
by 1870. But even this rather slight development of a decade 
was of importance in the occupation of the "Great American Desert". 
The "desert" now lay between two frontiers. Upon the natural 
westward progress of the old frontier there was being exerted an 
attractive or pulling force by the new frontier which already 
was tending to accelerate its movement. No better example of 
this is to be found than in the demand of the new frontier for 
better and quicker communication and transportation out of which 
grew the projection and construction of the Union Pacific Railroad. 

Now that the Civil War was over what westward movement 
could be expected of the old frontier which had remained al­
most stationary in eastern Kansas and Nebraska for nearly a 
half century? In reading Tomlinson's account of Kansas in 
18581 and A.B. Whiting's recollections of border conditions 
in Kansas from 1850 to 18602 and then studying the Census 
reports of 1860 on the population of Kansas, one is impressed 
with the westward extension of population that occurred at 
the close of the decade. The Census reveals that the popu­
lation of Kansas in 1860 was scattered through the three east­
ern tiers of counties with the density increasing toward the 

Western Border Conditions in the '50's and '60's", Collect­
ions of the Kansas State Historical Society, XII, 1-10.
Missouri river. But a decade later the Census shows that three additional tiers of counties have been added to the three of 1860, and moreover, that the density of population in the original three tiers of counties has greatly increased. When we consider the slow movements that the frontier had made previous to 1860 we must recognize in the decade of 1860-70 a pronounced acceleration in the old frontier's progress in Kansas at least. This acceleration it seems may be accounted for in part by the heavy migration to the Rocky Mountain gold fields which brought large portions of the doubtful region beyond the then frontier under the observation of thousands who were really agriculturists, and only gold seekers for the time being. These migrations had made a large class of people familiar with the actual conditions in the interior of Kansas and Nebraska; thus when this land was thrown open to settlers by the liberal Homestead Act of 1862 it at once began to settle up. Once it had been shown that agriculture could be carried on in parts of that region once considered as uninhabitable a considerable step had been taken in occupying in its entirety the region long known as the "Great American Desert".

Ranching constitutes the fourth epoch in the story of the settlement of the "Great American Desert", and its beginning may be fixed with the year 1866 when the first drive of Texas cattle was made to the Northern plains. North American ranching owes its origin and early development to the Spaniards who planted the industry in Mexico soon after their occupation of that province. For nearly two centuries ranching maintained

1. Population of the United States in 1860, the Eighth Census, I, XVI, XXXIV, XXXV.
its simple existence in the region of its origin with little change or expansion. The only change of significance in the industry before 1866 was the control which the Americans secured over it in what is now the Southwest of the present United States. Nevertheless ranching remained essentially the same, nor did it undergo a change after it had been extended to the entire West. That ranching never extended itself sooner than 1866 to the northern plains was because the industry had no incentive for expansion. Because of the lack of a market the industry was not sufficiently profitable to warrant any expansion of it and so under the old Spaniards it had undergone no change. But the industry under the Americans began to expand even without a good market and by 1866 the point was reached when the American cattlemen concluded that they must secure new range for their increasing herds. This could only be secured to the north of their present location and so in 1866 there began the series of great cattle drives from Texas which characterizes the early history of the institution on the Western plains. There was also the consideration of a market which influenced the extension of the cattle industry to the northern plains of the "Great American Desert". While there was no market on the northern plains, nevertheless cattle grown on those plains would be nearer a market than they would be in Texas and the cost of placing them on the market would be reduced to such an extent that the profits would not be lost in the cost of transportation. The projection of Western railroads probably led the Texas
cattlemen to believe that in a short time their cattle could be easily sent to a good market by rail providing the cattle were conveniently located near such a railroad. Since it was already known that the first railroads would pass thru the Northern plains this knowledge may have been a factor in promoting the northern cattle drives.¹

By 1870 the region of the "Great American Desert" had become a part of the cattle range. Southern cattlemen had brought their herds northward and established themselves while Easterners had established themselves in the industry with stock procured from Texas. That large region which had long been believed worthless was now supporting, in addition to the wild native life upon it, thousands of head of cattle.² Since practically all of the Far West was vacant public land and that which was owned or reserved for public or private benefit could easily be leased, there was little or none of the "Great American Desert" which did not come directly under the influence of the cattle industry. The decade, 1870-30, saw all of the land about the water courses preempted by the ranchers to insure a supply of water for their cattle; the number of cattle increased from thousands to hundreds of thousands;³ and the Far West was subjected to the power and authority of the cattle owners.

The development of the cattle industry after 1866 was rapid and steady, because it was profitable. Reginald Aldridge in his Life on a Ranch estimated that the profits during the

¹ A synopsis of McCoy, "Historical Sketches of the Cattle Trade in the West and Southwest," 1874, in Transactions of Kansas State Historical Society, XI, 124. ² Table, page 68. ³ Ibid.
first ten years of the industry averaged from 20 to 50 per cent. While Eastern capital looked with suspicion on the cattle business at first, it soon came to appreciate the profits to be had after a few careful ventures, and as a result gradually gained control of a large share of the industry. At the same time that Eastern capital was beginning to invest in the cattle business Scotch and English capital became interested in the possibilities of cattle raising. Ultimately a large portion of the industry came under their control. The last years of cattle ranching saw the passing of the small rancher and his place taken by the powerful cattle company or the almost equally powerful cattle king. Under these the cattle industry reached its greatest development about 1890 and at the same time the large cattle owners reached the zenith of their power and influence in the West. During this period their power was little short of absolute and it was wielded most despotically.

The following table has been compiled from United States Census reports in an attempt to show the development of the cattle industry from 1870 to 1900. There is the unavoidable difficulty, unfortunately, in that there is no way of knowing the distribution of the cattle between the range and the farms. For the sake of comparison, however, it is fairly valuable. The decline of the cattle industry of the range will be seen from 1890 to 1900.

<table>
<thead>
<tr>
<th>State</th>
<th>1870</th>
<th>1880</th>
<th>1890</th>
<th>1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>71,000</td>
<td>792,000</td>
<td>1,167,000</td>
<td>1,164,000</td>
</tr>
<tr>
<td>Dakota</td>
<td>12,000</td>
<td>207,000</td>
<td>999,000</td>
<td>1,705,000</td>
</tr>
<tr>
<td>Kansas</td>
<td>373,000</td>
<td>1,533,000</td>
<td>3,188,000</td>
<td>3,568,000</td>
</tr>
<tr>
<td>Montana</td>
<td>57,000</td>
<td>428,000</td>
<td>1,442,000</td>
<td>781,000</td>
</tr>
<tr>
<td>Nebraska</td>
<td>80,000</td>
<td>1,113,000</td>
<td>2,143,000</td>
<td>2,422,000</td>
</tr>
<tr>
<td>New Mexico</td>
<td>57,000</td>
<td>348,000</td>
<td>1,632,000</td>
<td>803,000</td>
</tr>
<tr>
<td>Texas</td>
<td>3,494,000</td>
<td>4,895,000</td>
<td>8,544,000</td>
<td>7,280,000</td>
</tr>
<tr>
<td>Wyoming</td>
<td>12,000</td>
<td>521,000</td>
<td>934,000</td>
<td>561,000</td>
</tr>
</tbody>
</table>

Although the cattle industry had first recognized the potential worth of the "Great American Desert" and had first laid claim to it by actual settlement, the cattlemen were not always to retain it. Parts of this once shunned region were desired by homesteaders almost as early as they were desired by the cattlemen, but the two groups did not come into serious conflict until probably about 1880. It was the steady westward movement of the farmer's frontier and the demands of the homesteaders to settle on lands of the Government, occupied by the cattle owners which brought on the struggle between the cattlemen and the Little Fellows. It must be remembered that the lands which the cattlemen used were a part of the Public Domain and were open to actual settlers under the provisions of the Homestead Act. But the cattlemen because they had filed on the land about the water courses

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1. Showing decrease over previous Census.
2. No data for South Dakota.
3. A term of derision applied to homesteaders.
4. Exception should be made of the land about the water courses.
and had for some years used the public lands as their own, came to believe that they had a perfect right to remain where they were located, regardless of the claims of the Little Fellows who had legality on their side. As time went on and the pressure of the homesteaders became greater the cattlemen resorted to strong measures to protect themselves in what they considered their rights. There is plenty of evidence that both sides resorted to violence when the contest was becoming most bitterly waged. As a last resort the cattlemen began fencing their range. In Western Nebraska large areas were fenced in, a million acres were enclosed by one company in Colorado, and in Kansas entire counties were fenced. But fencing was of little avail, for the homesteaders simply destroyed the fence wherever it interfered with them. In Wyoming homesteaders were ordered to move out, and in Montana some were actually driven out, and their property confiscated.

Congress was slow in dealing with the tense situation existing in the West. February 25, 1865, it passed an act prohibiting any and all enclosures of the Public Domain except under claim of title made in good faith. President Cleveland on the same day issued a proclamation calling upon all civil officers on whom the legal duty justly fell for enforcing the act to execute the law. With the rather un-

certain support of the Government the homesteaders con-
tinued their invasion of the cattle country and by force
of numbers finally succeeded to the ascendancy which the
cattlemen had lately held. The table on page shows
the extent of the decline of the cattle industry of the
range from 1890 to 1900. The Little Fellows at last won
their fight for the land of the "Great American Desert",
and under them it came to support general farming or a
diversified agriculture not dissimilar to that of the more
naturally favored plains of the immediate Mississippi valley.

The fact that the cattle industry occupied the "Great
American Desert" for two decades before the emigrants reached
the region in any considerable numbers and convinced the
most skeptical that the land was not a barren waste consti-
tutes the great contribution of the cattle regime to the
final occupation of this long mistrusted section of the
country. Through the carrying on of cattle ranching a de-
tailed and minute knowledge of the "Great American Desert"
was developed to take the place of the general and somewhat
vague information available prior to the advent of the in-
dustry. Then the development of a more complete network of
routes of communication is important, as well as the found-
ing of towns, and the beginning of commercial institutions.

The Development of Agriculture in the "Great American Desert" and the Final Occupation of the Region of the "Desert".

In this chapter we shall consider the development of agriculture in the supposed "Great American Desert" and the elimination of that barrier which so long retarded the westward movement of the American people. Among the prophesies made with regard to the future of the "Great American Desert" there is none more interesting than that of William Gilpin who wrote as follows in 1857: "The American people... are about to inaugurate a new and immense order of industrial production - pastoral husbandry. Its chief theatre will be this terra incognita intermediate between the two oceans. Once commenced it will develop rapidly. We also anticipate here the successive inauguration and systematic growth of other distinct orders of husbandry - the culture of Cereals, hemp, tobacco, fruits - and the production of meats, leather and wool. Railroads and other channels of transportation by land or water will be established connecting this region with either sea; internal commerce will flourish and the great pastoral garden of the world will become the happy abode of untold millions of generations yet unborn".

There was little that Gilpin could have based his prophecy on for there was little agricultural development of any kind to be found in this region in 1857. By this time there had been some attempts at agriculture in the "desert" but these
were very limited in extent. The most extensive agricultural
development was to be found in New Mexico. In the vicinity
of Santa Fe and Albuquerque the New Mexican farmers, and a
few Americans were carrying on farming with the aid of irri-
gation. A settler there wrote in December 1852, that hay, corn,
wheat, barley, oats, and buckwheat were being grown. "Land in this
country" said the writer, "is nothing, water everything". 1

With extensive irrigation the writer believed that New Mexico
could develop into an important agricultural country. In western
Texas, especially about El Paso, some agriculture was being car-
rried on by Mexicans with the aid of irrigation. Probably as
early as 1840 Americans had grown corn and other staples in
the upper Arkansas valley. 2 Joel Palmer on his way to Oregon
in 1845 passed Fort Laramie and noticed that corn was being
grown near the fort. From its appearance, however, he concluded
it would prove a failure. 3 In the Yellowstone river valley
by 1846 the Indians were growing wheat, corn, oats, and potatoes
and had constructed a flour mill. A Jesuit missionary, Father
de Smet, had made this rude beginning possible. 4

The spread of agriculture from the East had not reached
the 100th meridian by 1857; agriculture was still confined to
a narrow belt west of the meridian of the Great Bend of the
Missouri. 5 The following table compiled from the Census re-
port of 1860 will show how inconsiderable had been the westward
advance of agriculture beyond the Missouri at the close of the
sixth decade:

   Docs. 28th Cong. 2nd Sess. No. 174, 115-7. 3. Thwaites, Early Western
   Travels, XXX 61, 4. Thwaites, Early Western Travels XXIX 351-2.
During the next decade there was a steady advance of agriculturists westward from the Missouri into Kansas, Nebraska, and Dakota. The previous decade had witnessed the beginning of Colorado and the present decade was to see the development of agriculture in that territory. It was in this decade that Montana and Wyoming were created as territories and their vast acres occupied by the cattle industry, the significance of which was pointed out in the previous chapter. While throughout this decade the agricultural frontier moved steadily westward, the majority of the farmers probably thought that it could never proceed farther than the edge of the "Great American Desert" at the 100th meridian for many years, if ever. A Nebraska farmer in discussing the sheep industry in his state in 1864 wrote as follows: "That portion of Nebraska Territory adapted to the rearing of sheep is the eastern half... There is a large region of country extending still further west... which will probably remain uninhabited by man and those domestic animals which are wont to follow him in his progress toward the verge of civilization, for half a century yet to come". Another article written three years later on the agricultural possibilities of the West reads in part as follows: "Let no one be deterred from making a home upon the prairie, for he will not only find good health but its beautiful plain and fertile soil will afford a rich supply

<table>
<thead>
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<th>State</th>
<th>No. Farmers</th>
<th>Value of Farms (Dollars)</th>
<th>Production of Corn (bu.)</th>
<th>Production of Wheat (bu.)</th>
<th>Production of Wool (Pounds)</th>
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</thead>
<tbody>
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<td>Dakota</td>
<td>...</td>
<td>96,000</td>
<td>20,000</td>
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<td>...</td>
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<td>12,258,000</td>
<td>6,151,000</td>
<td>194,000</td>
<td>25,000</td>
</tr>
</tbody>
</table>

of the necessaries and luxuries of life, and bring all the enjoyments of independence and abundant wealth." But this part of the prairie to which he referred did not include the region lying beyond the eastern edge of the "desert". The report of the first geological survey of Kansas, published in 1866, expresses the same opinion for "in many portions of the western part of the State there is such a scarcity of timber as will retard the settlement of the country for many years". But for three important factors which this same decade saw come into being and which marked a new era in the development of the trans-Missouri West, this belief might have been justified.

Probably no single event in the history of the West contributed more to the elimination of the notion of the "Great American Desert" and to the occupation of the region which it was supposed to occupy, than the Homestead Act of May 20, 1862. There had been an attempt to secure the enactment of such a law in Buchanan's administration but the presidential veto had thwarted its passage then. By the provision of the original act the head of any family, or any person who was of age, and a citizen of the United States, or any foreigner who declared his intention of becoming an American citizen, and had not engaged in war against the United States, might receive a quarter section of minimum lands or a half quarter section of

double minimum lands on five years residence and improvement thereof. By amendments the original act has been somewhat modified, but to the advantage of the homesteaders however.¹ To the head of an American family struggling under adverse economic and social conditions such a policy of free lands was a real opportunity. Ambitious young men saw in these free western lands their opportunities. The European, accustomed to his few acres, could not resist the lure of these ample acres which he might have simply for the asking. How much this act contributed to the advance of the agricultural frontier upon the "Great American Desert" may be seen from the following table of homestead entries from 1863 to 1876.² (See table on page 76.)

In order to prevent wrong conclusions being drawn from the above mentioned table it must be stated that by 1870 the region of the "Great American Desert" had not yet been entered except in a few comparatively small and isolated places;³ even a decade later it had not been entered to any appreciable extent save in western Kansas and Nebraska and along the eastern base of the Rockies in Colorado.⁴

A factor as important in the elimination of the Great American Desert as the Homestead Act of 1862 was the development of a system of western railroads. An important step in this work was taken on July 1, 1862 when the United States granted to the Union Pacific and the Central Pacific Railroads their first charters with liberal land grants and a

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<th>'64</th>
<th>'65</th>
<th>'66</th>
<th>'67</th>
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<th>'69</th>
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<td>99</td>
<td>47</td>
<td>66</td>
<td>82</td>
<td>63</td>
<td>57</td>
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</tr>
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<td>24</td>
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<td>135</td>
<td>157</td>
<td>206</td>
<td>288</td>
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<td>647</td>
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<td>1,225</td>
<td>807</td>
<td>839</td>
<td>362</td>
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<td>147</td>
<td>155</td>
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<td>226</td>
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<td>1</td>
<td>1</td>
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<td>204</td>
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<td>326</td>
<td>377</td>
<td>509</td>
<td>713</td>
<td>696</td>
<td>743</td>
<td>615</td>
<td>266</td>
<td>238</td>
</tr>
<tr>
<td>Wyoming</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
subsidy of bonds in addition. 1 By an amendment of July 2, 1864 the aid of the Government was further extended. 2 Thus assisted the first transcontinental railroad was built and completed in May 1869. The following year a railroad was completed from Denver to Cheyenne, 3 and the Union Pacific, Eastern Division, was opened between Denver and Kansas City. 4 July 2, 1864, Congress chartered the Northern Pacific and granted it a liberal subsidy in lands; it was opened from Duluth to Bismarck, Dakota Territory, in 1873, 5 but not completed to the Pacific until September, 1883. 6 In 1872 the Denver and Rio Grande had been built from Denver to Pueblo and by 1880 had been extended up the Arkansas as far as Conon City. 7 The Atchison, Topeka, and Santa Fe was opened to the Colorado Territory line in 1872 and to Santa Fe in February, 1880; it was also the recipient of Government aid. 8 By January, 1882, the Texas and Pacific was operating a line between Gouldsboro (opposite New Orleans) and El Paso. 9 The same year the Chicago, Burlington, and Quincy opened its line between Chicago and Denver. 10 In 1883 a line was completed between San Francisco and El Paso which two years later became the Southern Pacific. 11 By 1883, about the time that the "Great American Desert" was beginning to settle up, a fairly extensive system of western railroads had been established. Not only were the railroads to throw open the entire Far West to the American agriculturist but at the same time they were to furnish him a powerful weapon in his work of occupation.

The third factor which came into being in the sixties and which is of real significance in a consideration of the settlement of the "Great American Desert" was the introduction of science and mechanics into American agriculture. This new development is well reflected in the very interesting report of the Commissioner of Agriculture for 1862.\(^1\) In speaking of the conditions upon which our agricultural progress depends, Mr. Newton states that the fourth "is a more thorough knowledge and practice of agriculture as a science and as an art; and by this is meant a knowledge of the principles - the whys and wherefores - which lie at the foundation of successful farming."\(^2\) It is a stirring plea which he makes for the application of science and education to agriculture in the interest of that industry and for the advancement of the agricultural class. In another part of his report he discusses the development of mechanics in agriculture. "The cast iron plough, first patented ... in 1797, has undergone various modifications, until it has reached a high degree of perfection. The spade, the hoe, the hay fork, and the other common implements ... of husbandry, are lighter, of better material and temper, and more adapted to the use of the farmer. A large number of our farmers now use mowers for cutting their grasses, and the vast wheat fields of the west and northwest could not be harvested without the use of the reaper, nor the wheat separated from the straw, and the corn from the cob without threshing and shelling machines....\) without mechanical appliances, and the use of horse and steam

\(^1\)Report of the Commissioner of Agriculture, 1862. \(^2\)Ibid, 15ff.
power in the cultivation of the soil, our vast fields of grain could not be harvested and made ready for food and shipment.\(^1\) Newton predicts that within a few years the more enterprising farmers will be using steam exclusively for ploughing, planting, harvesting, hauling, threshing, etc.\(^2\) Some idea of the extent to which science and mechanics were being put to use in agriculture in the late sixties may be seen in the fact that during the year 1869, 1,900 patents were granted for improvements and inventions of agricultural machinery\(^3\) and 1,385 in 1870.\(^4\) Those of 1869 included 40 patents on corn shellers and huskers, 80 on harrows, drags, pulverizers, etc., 45 on milk coolers and dairy apparatus, 30 on mowing and reaping machines, and 80 on seeding and sowing machines.\(^5\) This factor is of the greatest significance since it came at the time of the opening of the free western lands and the development of a system of western railroads. The "Great American Desert" could never long remain unclaimed and unsettled with this powerful combination of factors at work.

Still a fourth factor was foreshadowed in this same period which was land hunger. However, this factor did not become operative in the region of the Great American Desert to any considerable extent until a decade later. The Public Domain, issued in 1880 by the Public Land Commission, stated that the lands of the Mississippi valley which after 1824 had sold for $1.25 were selling by 1862 at from $50 to $80 per acre. As a

\(^1\) Report of Commissioner of Agriculture 1862. 9. \(^2\) Ibid. 3. Ibid, 1869, 315. 4. Ibid, 1870, 293-4. 5. Ibid, 1869, 315.
result the former purchasers of the Government lands were selling their purchases and moving west to Iowa, Wisconsin, Minnesota, and Missouri and again taking cheap government lands under preemption laws. "The western emigration," reported the commission, "caused a rush - a migration of neighborhoods in many localities of the older Western states. Following the sun, their pillar of fire, these State founders moved westward, a resistless army of agents of American civilization, and there was a demand for homes on the public lands, and a strong pressure for the enactment of a law which should confine locators to small tracts, and require actual occupation, improvement, and cultivation."

But a strong combination of factors such as those just mentioned would be required in the work of occupying this region which had for so long a time been looked upon as doubtful, and impossible of occupation. The Sixth Annual Report of the United States Geological Survey of the Territories, embracing Portions of Montana, Idaho, Wyoming, and Utah, 1872, indicated quite clearly that the task would be a difficult one. The western portion of Dakota Territory, approximately that portion lying west of the line drawn for the eastern border of the "desert" was reported to be "adapted to grazing and pastoral pursuits", but it was the belief of the geologist in charge of the survey that the "average rainfall is not sufficient for profitable agricultural operations". There might be seasons, he admitted, when the supply might be sufficient, but these would form the exceptions.

rather than the rule.\textsuperscript{1} With respect to western Kansas and Nebraska this same report called attention not only to the insufficient amount of rainfall but to the lack of building materials and fuel, the depth to which wells must be sunk in order to obtain water, the scarcity of running streams for providing water for live stock, and the severity of the winter storms.\textsuperscript{2} From the report of a geological survey made of Wyoming in 1870 there is little encouragement held out for the future of agriculture in that territory. It was thought that "the business of the (Union Pacific rail) road necessary at the termini of divisions, stock-raising, temporary grazing of passing herds, lumbering, and probably coal mining, will bring... a considerable population" to southwestern Wyoming.\textsuperscript{3} That agriculture would develop here does not seem to have even been considered. A similar report made of a geological survey in Montana Territory in 1871-72 conveys some meagre information in regard to the agricultural resources of that territory. "It is true," reads the report, "that the agricultural lands are separated into comparatively small areas; but this character has its advantage, as it secures an ample supply of water for irrigating purposes". According to this report irrigation was necessary for any development of agriculture. "The climate of this Territory is much more favorable for agriculture than would be anticipated from its northern and elevated position". Indian corn, and even melons could be grown without serious climatic


\textsuperscript{2} 313.

difficulties. How little was actually known of the eastern part of the Territory is admitted when the report states that there had been obtained no "satisfactory account of the extreme eastern part of the Territory, especially that part lying east of Fort Benton". One reading this report in 1872 would hardly have cared considering settling in Montana Territory.

Some interesting facts are revealed relative to agricultural development about the "Great American Desert" by the census of 1870. From 1860 to 1870 the number of farmers in Kansas increased from 16,000 to 73,000 and in Nebraska from 4,000 to 23,000. The valuation of Kansas farms rose from twelve millions to ninety millions and in Nebraska from four millions to thirty millions; in Dakota from less than a hundred thousand to two millions; in Colorado from nothing to three and a half millions; and in Montana from nothing to almost a million. In Texas and New Mexico there was a slight decrease in the value of the farms. The production of wheat during the decade 1860-70 increased in Kansas from 194,000 bushels to 2,391,000 bushels; in Nebraska from 148,000 to 2,125,000; in Colorado from nothing to 258,000; and in Montana from nothing to 181,000 bushels. In these same states and territories there were similar increases in the production of corn and wool. While the Census of 1870 revealed the growing agricultural strength of Kansas and Nebraska in particular, it also suggested the possibilities of agriculture in the territory adjacent to the Rocky Mountains and in the Dakota Territory. Additional evidence from other sources adds to our information in regard to

agricultural development about the "desert" by 1870. A prosperous agricultural colony about El Paso was developing.\(^1\) New Mexico was slowly growing in agricultural importance with the immigration of Americans and the introduction of better methods of farming.\(^2\) In the upper Arkansas valley 80,000 acres were estimated to be under cultivation, the produce of which was valued at $1,000,000. More important than the development in the Arkansas valley was that in the South Platte valley which alone was producing one half of Colorado's farm products.\(^3\) The Surveyor General of Montana reported the value of the crops of his Territory for 1869 at $3,500,000; this is probably too high. On the North Platte river about the present site of North Platte, Nebraska, there was a small agricultural colony,\(^4\) and likewise one on the Smoky Hill river in central Kansas.\(^5\)

Of fundamental importance in the extension of the agricultural frontier into the "Great American Desert" was the virtual disappearance of the Indian problem, as a potential danger to the isolated farmers on the edge of the frontier, during the decade 1870-80. During this decade there occurred two Indian disturbances of major importance, the quelling of which practically terminated Indian hostilities in the Far West for all time. The first of these, known as the Sioux War, broke out in 1875 and was not put down until October 1877. The second, known as the Nez Perce War, continued from June until October, 1877, when the Indians were finally defeated and captured by General Miles, famous Indian fighter whose death occurs as this
is written. These two Indian wars made a distinct impression on the western Indians and as a result after 1877 they proved quite tractable for the most part. The Reports of the Commissioner of Indian Affairs for the years following 1877 devote more and more space to a discussion of Indian education and occupations and only a small part of them deal with Indian unrest or actual depredations. While it is true that the Indians made slow progress toward civilization, and retained a large part of their old institutions, the pressure of the whites had become so great by the close of the seventies that they no longer could roam at will over the plains, a potential source of danger to the advancing frontier.

One of the things which has always characterized the advance of the American frontier has been its demand for internal improvements at national expense. One of the demands that the settlers made as soon as they began to occupy the "Great American Desert" was for a wholesale system of irrigation to be constructed and operated by the National Government. The following extract from an article prepared by a Colorado farmer is perhaps a fair representation of this view assumed by the large body of Western farmers. "The great work of the reclamation of the Great American Desert will not cost a hundredth part so much as the works of European engineers, and will put the gigantic Suez canal into the deepening shades. It remains to be seen whether the Congress of the United States will place alongside her magnificent work of uniting the Atlantic and Pacific with an iron band the equally magnificent work of
wiping out from the United States the bar-sinister upon her escutcheon - the 'Great American Desert'. But the National Government paid scant attention to the demands for western reclamation during this decade or the next. From 1870 to 1880 there was some development of irrigation in various parts of the "Great American Desert" but there seems to be no way of determining its extent. The extensive development of this aid to Western agriculture was not to come until the twentieth century.

Since one of the chief means of accurately determining the westward trend of agriculture is to be found in the United States Census Reports, let us again draw upon this source of information in order to determine something of the progress made from 1870 to 1880. The farms in Kansas during this period increased in value from $90,000,000 to $235,000,000 or 160%; those in Nebraska from $30,000,000 to $106,000,000 or 280%; those in Dakota from $2,000,000 to $22,000,000 or 1025%; those in Texas from $60,000,000 to $170,000,000 or 185%; those in Colorado from $3,000,000 to $25,000,000 or 630%; those in Montana from less than $1,000,000 to more than $3,000,000 or 260%; and those in Wyoming from $18,000 to $836,000 or 400%. The number of farmers in Kansas increased from 73,000 to 206,000; in Nebraska from 23,000 to 91,000; and in Texas from 167,000 to 359,000. Montana now had an agricultural population of 5,000; Wyoming 2,000; New Mexico 14,000; Colorado 14,000; and Dakota 29,000. These figures show to a certain extent the advance made by the

agricultural frontier but they are rendered much more significant when considered in relation with the actual figures on the popula-
tion of the "desert" at the close of this decade. According to
the Census reports of 1880 the "Great American Desert" had a popu-
lation of 232,669, which was distributed as follows: Colorado
85,397; Kansas 33,289; Texas 24,426; New Mexico 23,274; Nebraska
22,288; South Dakota 18,064; Wyoming 15,349; Montana 5,748; and
North Dakota 4,834.¹ By 1897 the frontier line of population in
Dakota ran approximately along the 97 meridian. The settlements
in Kansas and Nebraska had made great strides over the plains and
had reached "the boundary of the humid region, so that their west-
ward extension beyond this point is to be governed hereafter by
the supply of water in the streams."² Already long ribbons of set-
tlements were to be found extending westward along the courses of the
streams. Considerable progress had also been made in Texas, both in
the extension of the frontier and in the increase in the density
of its population. The population map for 1880 will reveal the
progress made in the territory along the eastern base of the Rockies.
With the opening of the ninth decade conditions were most favorable
for an early inpouring of population into the "Great American
Desert" throughout its entire area.

During the decade of 1880-90 the occupation of the "Great
American Desert" began in earnest and so well was it prosecuted
that by the close of the period the major part of it could be
truly said to have been occupied by a permanent population. The
frontier line of 1890 ran along the Missouri river through the
Dakotas to the Nebraska border where it dropped southward to

¹ These figures are compiled from U.S. Census Reports. ² U.S.
Census Report 1880, Population XX.
the center of that state. Here it turned westward at right angles to include all of southwestern Nebraska and the south-eastern quarter of Wyoming. The line then ran along the western boundary of Colorado into New Mexico well beyond the western limit drawn for the "desert" in that region. Large portions of western Texas and eastern New Mexico, however, were not included. At the same time the frontier from the west advanced far enough eastward to include the major portion of Montana and a large part of Wyoming. By 1890 something less than one fifth of what had constituted the "Great American Desert" remained beyond the frontier. During this decade the old notion of the "Great American Desert" was finally dispelled. It was now peopled with a settled population with permanent institutions, who depended for the major part on agriculture for their maintenance.

Those same factors of science and mechanics in agriculture, free and ample lands, and improving communication and transportation, which had made possible the rapid development of agriculture in the Far West in 1860 to 1880 were likewise responsible for the agricultural development during the period 1880-1890. Out of the first of these came the establishment of a number of irrigation projects, many of which remain today, although probably incorporated in more comprehensive systems. All of those constructed during this decade were built by private enterprise, so far as I have been able to learn. In Montana near Billings one project was completed by 1884 which had cost $120,000 and which watered some 60,000 acres. 1 By January, 1884, seventeen irrigation companies had been incorporated in Wyoming and a number of projects

were in various stages of construction. On one of these a quarter million dollars had been expended and it was not yet completed. While there are no figures available on irrigation in New Mexico at this time, it is safe to conclude that the irrigated lands in this territory included several thousand acres, since only by irrigation could agriculture be carried on there. As yet the Dakotas were little interested in irrigation. In Kansas some 120,000 were reported to be under water; it would seem that this figure was probably too high because of the much smaller figures to be found in later estimates. There seems to be no information available on irrigation in Nebraska at this time. At the close of this period, probably the greatest development of irrigation in the United States was to be found in Colorado. In 1884 this state had reported 155,000 acres under irrigation, virtually all of which was on the eastern slope. Without the aid of the Government the Western states had at this early time made a fair beginning toward the solution of their problem of aridity.

While the recitation of statistics is usually uninteresting, it seems to be the best means of adequately showing the development of agriculture in the Far West and the resultant settlement of the "Great American Desert". Colorado's crops in 1886 were valued at $4,467,000 and in 1889 at $8,937,000. For the same three years the value of the Dakotas' crops increased from $31,967,000 to $58,709,000 while the value of Kansas' and

1. Sen. Miss. Docs. 49th Cong. 2nd Sess. No. 15, 105. 2. Ibid. 3. Ibid. 114. 4. Ibid. 140.
Nebraska's crops increased from $62,051,000 to $78,370,000 and from $41,590,000 to $59,035,000 respectively.\(^1\) The growth and development of agriculture in those states which include a portion of the "Great American Desert" from 1880 to 1890 is shown in the following two tables:

<table>
<thead>
<tr>
<th>State</th>
<th>Farmers 1890</th>
<th>Value of Farms 1890</th>
<th>Value of Farms 1880</th>
<th>Population in Desert 1880</th>
<th>Population in Desert 1890</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas</td>
<td>250,000</td>
<td>235,189,000</td>
<td>559,726,000</td>
<td>33,289</td>
<td>101,513</td>
</tr>
<tr>
<td>Nebraska</td>
<td>170,000</td>
<td>105,933,000</td>
<td>402,359,000</td>
<td>22,288</td>
<td>127,435</td>
</tr>
<tr>
<td>North Dakota</td>
<td>12,000</td>
<td>22,401,000</td>
<td>73,310,000</td>
<td>4,384</td>
<td>25,093</td>
</tr>
<tr>
<td>South Dakota</td>
<td>68,000</td>
<td></td>
<td>107,466,000</td>
<td>18,064</td>
<td>50,750</td>
</tr>
<tr>
<td>Texas</td>
<td>419,000</td>
<td>170,469,000</td>
<td>399,971,000</td>
<td>24,426</td>
<td>68,746</td>
</tr>
<tr>
<td>New Mexico</td>
<td>23,000</td>
<td>5,514,000</td>
<td>8,841,000</td>
<td>23,274</td>
<td>38,495</td>
</tr>
<tr>
<td>Colorado</td>
<td>37,000</td>
<td>25,109,000</td>
<td>85,035,000</td>
<td>85,397</td>
<td>249,941</td>
</tr>
<tr>
<td>Montana</td>
<td>13,000</td>
<td>3,235,000</td>
<td>25,512,000</td>
<td>5,478</td>
<td>17,684</td>
</tr>
<tr>
<td>Wyoming</td>
<td>8,000</td>
<td>836,000</td>
<td>14,461,000</td>
<td>15,349</td>
<td>45,420</td>
</tr>
<tr>
<td>Oklahoma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>232,669</td>
<td>727,751</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: By farmers is meant the heads of families of those owning and using the land. This does not include the entire agricultural population.

\(^1\) Report of Comm. of Agriculture for 1886 and 1889. (See Statistician's Reports).
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas</td>
<td>105,729</td>
<td>17,324</td>
<td>2,856</td>
<td>259,575</td>
<td>30,400</td>
<td>2,253</td>
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<td>Nebraska</td>
<td>65,450</td>
<td>13,847</td>
<td>1,282</td>
<td>215,896</td>
<td>10,571</td>
<td>791</td>
</tr>
<tr>
<td>Texas</td>
<td>20,065</td>
<td>2,568</td>
<td>6,928</td>
<td>69,112</td>
<td>4,283</td>
<td>18,325</td>
</tr>
<tr>
<td>North Dakota</td>
<td>2,001</td>
<td>179</td>
<td>510</td>
<td>13,152</td>
<td>26,430</td>
<td></td>
</tr>
<tr>
<td>South Dakota</td>
<td></td>
<td>16,541</td>
<td>1,074</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Mexico</td>
<td>634</td>
<td>707</td>
<td>4,019</td>
<td>583</td>
<td>343</td>
<td>7,981</td>
</tr>
<tr>
<td>Colorado</td>
<td>456</td>
<td>1,425</td>
<td>3,197</td>
<td>1,572</td>
<td>2,845</td>
<td>4,544</td>
</tr>
<tr>
<td>Montana</td>
<td>6</td>
<td>470</td>
<td>995</td>
<td>14</td>
<td>458</td>
<td>12,187</td>
</tr>
<tr>
<td>Wyoming</td>
<td>25</td>
<td>5</td>
<td>692</td>
<td>74</td>
<td>4,147</td>
<td></td>
</tr>
</tbody>
</table>

Note: In this table the last three ciphers have been omitted.

From 1890 to 1900 there was a rapid extension of irrigation in the region of the "Great American Desert". This development occurred for the most part in the regions closely adjacent to the upper waters of the numerous mountain streams. This explains the fact that in Montana, Wyoming, and Colorado the decade caused no decline in population as it did in western Kansas and Nebraska where irrigation had scarcely begun to develop. It was in this decade that the National Government was obliged to take note of the demands from the arid and semi-arid regions of the West for extensive reclamation work through irrigation.

An interesting development of the decade of 1890-1900 was the marked decrease in population in certain portions of the region.
once included in the "Great American Desert". The farmers of those portions of Kansas and Nebraska included in the region of the "Great American Desert" suffered a particularly sharp reverse in their westward advance during this ten year period. The primary cause of this development is to be found in the continued period of light rainfall from 1892 to 1898. While the rainfall during this period was only slightly below normal, it was sharply distinct from the period of abundant rainfall which this region had enjoyed during the late eighties and early nineties. It had been during this period of comparatively heavy rainfall that much of the population of western Kansas and Nebraska and eastern Colorado, reported by the Census of 1890, had entered the country. Large crops, particularly corn, had been grown without difficulty. But during the middle nineties, because of deficient rainfall, the settlers saw their crops fail with each successive year. Many of the settlers had entered the country with little or no money and in order to make a beginning had borrowed money. Many of these obligations they had been able to pay during the first prosperous years but they were left with insufficient funds to tide them over a very long period of bad years. Others had entered government land upon which they had made only slight improvements.

Both of these classes of settlers upon the beginning of the period of dry years were faced with the alternative of either leaving this stricken area and thus avoid the contraction of debts which their present property might never help them to repay, or of remaining and borrowing money, if possible, to tide them over,
in the hope of better years in the future and thus saving their lands and improvements. Many chose the former. Others who would have remained were unable to secure loans and were obliged to leave also. There was a third class, composed of itinerants, of whom there were many on the frontier at this time, who deserted the country at the approach of the period of dry seasons. As a result of this continued period of insufficient rainfall, population was materially affected. Those portions of Kansas and Nebraska lying west of the 100th meridian decreased in population from 101,513 to 85,104 and from 127,435 to 109,510 respectively. In the counties of Colorado lying along the eastern edge of the state a similar decrease in population occurred. In the other states or territories their respective parts included in the region of the Great American Desert increased in population but only slightly in comparison to their increase of the previous decade. But this reverse which the American agriculturist suffered in his westward movement was only temporary. 1

By the provisions of the Carey Act of August 17, 1894, each of the western states might secure from the public domain an amount of arid land not to exceed one million acres, providing the state should reclaim it and dispose of one eighth

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1 For this account of the agricultural reverse of 1890-1900 I am indebted to Mr. William Webster who until recently has lived in western Kansas near the Nebraska line. He and his associates were the first to engage in extensive wheat growing in Western Kansas. They began in 1899, following the period we have discussed, in Rooks County on land which was deserted by the settlers at that time. Later he was associated with Clay, Robinson & Co., Chicago livestock commission agents and visited much of western Kansas and Nebraska in the interests of the livestock business. Mr. Webster now resides in Boulder, Colorado, at 938 Lincoln Place. See also Sparks Irrigation
of it to actual settlers within ten years. I have been unable to learn to what extent the various western states took advantage of this law. The extent of irrigation in the western states at the close of the ninth decade is given in the Census reports as follows: Colorado continued to lead all of the states of the Union and was credited with 1,611,000 acres. Montana's irrigated lands totalled 951,000 acres. Wyoming was credited with 605,000 acres; New Mexico 203,000; Texas 50,000; South Dakota 47,000; North Dakota 5,000; Nebraska 12,000; and Kansas 24,000 acres.

With increased acreages of irrigated lands, with the introduction of newer and better methods of dry farming, and with the consolidation of the agricultural population about the limits of the old Great American Desert, the American farmers made a second and more successful advance upon the inimical region lying beyond the 100th meridian. By 1899 there were those who were coming to believe that even the maximum development of irrigation would be insufficient to meet the agricultural needs of the West. Elwood Mead, National expert in charge of irrigation investigation, wrote in the *Agricultural Yearbook* for 1899 that while the possibilities of irrigation "have but begun to be realized, yet when every available drop of water shall have been applied to the soil the irrigated lands will constitute a comparatively small proportion of the entire country." Then

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1. Report of Secretary of Agriculture, 1899, 228.
2. 601.
irrigated lands were more expensive than unirrigated lands and many of the western immigrants, now somewhat familiar with the methods of dry farming, chose to settle on the so-called dry farming lands instead of on irrigated lands. As a result there was a rapid development of dry farming methods toward the latter part of the tenth decade of the nineteenth century. In the report of the Secretary of Agriculture for 1908 we read that "dry farming has come to be recognized as an important factor in our future agricultural progress". According to the Secretary, "the last ten years (1898-1908) have witnessed a remarkable exodus of people from the eastern parts of the country to the western, especially to the dry parts of the Great Plains". As a result, this vast region, formerly considered unfit for agriculture, "is rapidly becoming one of considerable agricultural importance under the guidance of the Department and State experiment stations".

One of the ways in which the Department of Agriculture was of particular assistance to the farmers of the West was in the matter of plant and seed experimentation for determining what plants were best adapted to the arid and semi-arid portions of the West and for developing strains of the more common plants which might be profitably grown in regions of little rainfall. "It is proposed", wrote the chief of the Division of Forestry in 1897, "to systematically collect all the tress and shrubs which exist in the arid and subarid regions of the world into trial grounds, located in different parts of our own arid

1. Report of Secretary of Agriculture, 1908. 159.
belts, where they may be studied and observed, and where, finally, those can be selected which promise the best results for planting under those untoward conditions.¹ By 1905 the United States was districted and in each district was an expert whose duty it was to assist the farmers in making various seed and plant tests in which they might be interested. In the warehouse of the Department was kept "a supply of seed of such of the standard plants and grains as are considered worthy of wide distribution and to the list is added from time to time some new variety which has been tested and found valuable for a given section."²

The decade 1900-1910 saw the western parts of Kansas and Nebraska again occupied and also saw the western parts of the Dakotas peopled with a substantial agricultural population. The population of the entire region of the old "Great American Desert" enjoyed a real increase. From 1880 to 1890 its population had increased 212%; the following decade this increase had amounted only to 28%; from 1900 to 1910 the increase amounted to 81%. The population of the region of the former desert totalled 937,097 in 1900, but by 1910 this had increased to 1,702,615. In order to better appreciate this real development let us again notice some crop statistics.³ The total value of crops in Kansas was 89.3 per cent greater in 1909 than in 1899, this increase being due in part at least to higher prices. In Nebraska the increase in the value of crops for

¹ Agricultural Yearbook, 1897, 158. ² Ibid, 1905, 302-3. ³ Compiled from U.S. Census reports.
the same period amounted to 112.1 percent. The Census for
1910 revealed the fact that in North Dakota the value of crops
had increased 234.3 percent during the past decade and that
the acreage of crops had increased 103.1 percent. In South
Dakota the increase in the value of crops for the same decade
was not so great as in North Dakota, being only 184.1 percent.
Colorado's crops increased in value from 1899 to 1909 by 200.4
percent; those of Montana 177.9 percent; those of Wyoming
219.8 percent; those of New Mexico 191.2 percent; and those
of Texas 78.6 percent.

By 1910 the work of the pioneer American agriculturist
had been finished. It is true that large portions of the
West remained essentially in their native unproductive state,
a condition which still remains today. Nevertheless the work
of the pioneer farmer was finished by the close of the first
decade of the twentieth century for he had not only entered
all parts of the nation but had deliberately selected those
portions best adapted to successful agriculture on a basis of
theoretical and practical knowledge which he had gained only
after careful study and long experience. It is probably use-
less to argue whether his last achievement in the region of
the "Great American Desert" was more or less difficult than
his earlier achievements. Suffice it to say that his task
in subjecting this region to profitable agricultural produc-
ton was particularly difficult because of the new and unknown
factor of aridity which he here encountered for the first time.
Appended hereto is a table showing the growth of population in the "Great American Desert" from 1880 to 1910 inclusively. This has been compiled as carefully as possible from U.S.Census reports and the county has been used as a unit throughout.

<table>
<thead>
<tr>
<th>State</th>
<th>1880</th>
<th>1890</th>
<th>1900</th>
<th>1910</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>85,397</td>
<td>249,941</td>
<td>304,101</td>
<td>294,884d</td>
</tr>
<tr>
<td>New Mexico</td>
<td>23,274</td>
<td>38,495</td>
<td>61,202</td>
<td>160,510</td>
</tr>
<tr>
<td>Montana</td>
<td>5,748</td>
<td>17,684</td>
<td>51,417</td>
<td>129,491</td>
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<tr>
<td>Texas</td>
<td>24,426</td>
<td>68,746</td>
<td>124,357</td>
<td>324,270</td>
</tr>
<tr>
<td>Kansas</td>
<td>33,289</td>
<td>101,513</td>
<td>85,104d</td>
<td>139,955</td>
</tr>
<tr>
<td>Nebraska</td>
<td>22,288</td>
<td>127,435</td>
<td>109,510d</td>
<td>162,301</td>
</tr>
<tr>
<td>North Dakota</td>
<td>4,834</td>
<td>125,093</td>
<td>66,037</td>
<td>235,256</td>
</tr>
<tr>
<td>South Dakota</td>
<td>18,064</td>
<td>50,750</td>
<td>70,519</td>
<td>132,243</td>
</tr>
<tr>
<td>Wyoming</td>
<td>15,349</td>
<td>45,420</td>
<td>61,799</td>
<td>91,272</td>
</tr>
<tr>
<td>Oklahoma</td>
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<td>3,051</td>
<td>32,433</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>232,669</td>
<td>727,751</td>
<td>937,097</td>
<td>1,702,615</td>
</tr>
</tbody>
</table>

Note: 'd' - decrease in population.
Chapter V.

The Development of Weld County, Colorado.

It is believed that this study of the "Great American Desert" will be the more valuable if the growth and development of some representative portion of the region of the supposed desert may be studied as a type. For this purpose the present Weld County of Colorado has been selected.

In considering the early history of Weld County we may begin with the building of St. Vrain, established as a fur trading post about 1835. Fort Lupton was probably built only a short time later. Fremont records in his journal for July 6, 1843, while on his second expedition, that he passed "Fort Lancaster, the trading post of Mr. Lupton," and two other small posts on the South Platte, both of which were deserted. This post recorded by Fremont as Lancaster was probably Fort Lupton, thinks Chittenden. Fremont wrote of Fort Lancaster that it was beginning to assume the appearance of a comfortable farm; that livestock were ranging on the prairie, poultry were in evidence, and a garden had been made. But three years later when Parkman visited the South Platte he found Fort Lupton abandoned and fast falling into ruin. He also found a second deserted post which seems to have been Fort St. Vrain. With the decline of the fur trade in the South Platte valley the region on Weld County must have been virtually deserted from the early forties.

until the time of the gold rush to Colorado near the close of the sixth decade.

Among the would-be gold seekers there were some who soon resolved to give up gold mining for farming, an industry for which they were better fitted. They may have reasoned that farming on the so-called Great American Desert could be no less remunerative or uncertain than washing for gold in the stream beds at the base of the Rockies. There were, no doubt, discouraged gold seekers who had neither sufficient inducement nor means to return to their late homes and thus were willing to try farming in this new country in which circumstance had placed them. At any rate, during the summer and fall of 1859 a few settlers began to congregate in the vicinities of old Fort St. Vrain and Fort Lupton. Those who settled about old Fort St. Vrain met on October 6, 1859, and organized a claim club for recording and protecting their preemptions. Having done this they voted to allow each member to preempt 160 acres of the public lands.1

It was not until November, 1861, that the Territory of Colorado was divided into counties, seventeen in number, one of which was Weld.2 By this division Weld County not only included its present territory but that of Morgan, Logan, Sedgwick, Phillips, and the northern halves of Washington and Yuma as well. In its original extent it embraced an area greater than that of Vermont. St. Vrain's was named its first county seat.3

There is little information to be had concerning the early

development of the western portion of the original county.

Frank A. Root who was agent during parts of 1863 and 1864 at the stage station of Latham, located near the mouth of the Cache la Poudre, states that about the lower course of this stream there were a few settlers and that there were a few isolated ranches along the stage line between Latham and Denver. From another contemporary source we learn that there was a small settlement about old Fort Lupton. Max Clark, an early and prominent member of the Union Colony, mentions a community of early settlers near the mouth of the Big Thompson. During the latter part of the sixties, Weld County, like all other portions of the Great American Desert, came under the dominance of the cattlemen and became a part of the great cattle range, known as the Open Range. The opening of the Union Pacific to Cheyenne in 1868 and the beginning of construction on the Denver Pacific, a line to connect Denver with Cheyenne, in the same year must have led the cattlemen of Weld County to believe that they had been particularly favored and that their industry was permanently assured of success. But the coming of the railroads which seemed to hold so much of promise for the Weld County cattlemen was in reality to bring about the immediate curtailment of their industry and its early disappearance in its original state.

Among the early towns in the region of the present Weld County, the first which gave promise of becoming the metropolis was Evans. Its site had been selected for a station on the Denver Pacific in September, 1868, because of its location at the

1. Root, Early Days in Weld County, "The Trail, VI. No. 7, 7; 12.
point where the South Platte was to be crossed. Early in October the town was laid out and lots were placed on sale. An advertisement of Evans town lots which appeared in October, 1869, reads in part as follows: "The site of the town is a pleasant plateau on the banks of the Platte river, easily irrigated by a ditch from the Big Thompson of four or five miles in length which would make any amount of water power that might be required by the town. The extension of the railroad will doubtless give a great impetus to the settlement of this section of the country, while the settlements already made are sufficient to support a town of several thousand inhabitants". There is no doubt stated the Colorado Tribune for October 13, 1869, "but a permanent town of considerable importance will grow here (at the site of Evans), and that this winter it will be a lively place". On December 13, 1869, the Denver Pacific reached Evans and from then until May 1870, it is apparent from the contemporary newspaper accounts that the town enjoyed all of the advantages of being a railroad terminus and an important center of distribution. In June, 1870, the Denver Pacific was completed and the first train reached Denver on the evening of the twenty-second of that month. Now that Evans had ceased to be the railroad terminus its boom times were over and its decline began, a movement to which the rise of the new Union Colony contributed not a little.

Interesting in Colorado Territorial history are the various attempts at group or colony settlement. Second in point of time

yet most successful of these attempts was that of the Union Colony, organized in New York in December, 1869, through the efforts of Nathan C. Meeker, agricultural editor of the New York Tribune, and sponsored by Horace Greeley. Meeker had travelled through the West in the fall of 1869 and it was during this trip that the idea first occurred to him of founding a colony in Colorado.\(^1\) The site he then had in mind was one near the present city of Colorado Springs.\(^2\) Upon his return to New York he issued a call through the Tribune on December 4, 1869, "to proper persons" to unite with him "in establishment of a colony in Colorado Territory" and invited all who might be interested in the project as he outlined it to communicate with him at once.\(^3\)

In the same issue of the Tribune appeared an editorial by Greeley advising "temperate, moral, industrious, intelligent men who would like to make a home in the Far West to read his 'Meeker's) letter .... and should his plan suit them, write him on the subject".\(^4\)

A meeting of those interested in Meeker's project occurred on December 23, 1869, and the Union Colony was organized.\(^5\) A locating committee was appointed on January 3, 1870, and after having made a careful examination of available lands in Colorado, selected a colony site in the Cache la Poudre valley a short distance from Evans.\(^6\) In fact Evans was considered as a center for the colony but the town possessed saloons, a grave disadvantage, and as a result it was passed up.\(^7\) Commenting on this selection, the Rocky Mountain News for April 7, 1870, prophesied that the

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"hundreds of intelligent and enterprising people" who composed the Union Colony would "make the now wild but fertile valleys of northern Colorado to 'blossom as the rose'.

The selection having been made, the representatives of the Union Colony contracted with the National Land Company, the agent of the Denver Pacific, for the purchase of 9324 acres of railroad's lands, deed to which was granted April 11, 1870. An additional 160 acres of these railroad lands was secured through the agency of the Denver Land Association. Private lands within the site were acquired through purchase to the extent of 2592 acres, and vacant government lands were filed upon in the names of the colonists to the extent of some 60,000 acres, not only to secure possession of the property, but as one of the colony's representatives said, "to prevent uncongenial neighbors".

Early in May, 1870, the colonists began arriving at Greeley, the colony town. The Rocky Mountain News stated on May 21 that all was well at Greeley and that at least 400 persons were there. A man from Denver who visited Greeley late in May reported in the Rocky Mountain News for May 26 that the colony numbered about 500 persons and that it was still rapidly growing; that between thirty and forty houses were already constructed in Greeley and that many more were under construction. He also reported that a number of buildings had been purchased and conveyed from Evans. "Your correspondent has been informed", he said, "that nearly every house in Evans is for sale and can be purchased by the colony!" Greeley rose as Evans fell. Max Clark says that during

the first summer "we talked of a city of 10,000 inhabitants, and... I believe a majority of us expected to see a city of 5,000 inside of two years." But with the termination of the boom at the close of the first year Greeley did not prosper, yet managed to maintain its existence through the following period of depression that lasted until 1875, when it began an appreciable and constant growth.

Agriculture in the colony during the first few years was a failure. The original system of irrigation proved inadequate and crops suffered from the lack of water. Inexperience in semi-arid farming and numerous natural obstacles to which was added the grasshopper plague of 1872 and 1873 drew heavily upon the resources of the colonists and their courage as well. The hardships of the colonists from 1871 to 1875 are well pictured by Clark in his *Colorado Days*.

A second attempt at colony settlement in the region of the present Weld County was that of the St. Louis Western Colony, composed for the most part of farmers at Oakdale, Illinois, and headed by their minister, A.C. Todd. The man responsible for the organization of this colony, however, was James Pinkerton, a disgruntled member of the Union Colony, who withdrew and decided to form a colony of his own. The new colony was organized in November 1870, and by the middle of March, 1871, had located at Evans, largely through the influence of Pinkerton. "Complete control of the town site, together with 40,000 (sic) acres of what are known as the Evans and Carr lands adjoining" had been secured by the colony.

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Rocky Mountain News carried an article on the new colony with the significant subhead, "Evans to be repopulated". The Greeley Tribune in its issue of March 22, 1871, expressed its friendly feeling toward the colony which Boyd says was founded by Pinkerton "on purpose to cripple, and, if possible, to ruin Greeley". 1

"Evans is already starting up under the new order of things", said the Denver Tribune in its issue of March 27, 1871. "A new bridge is being built across the Platte at that place. New buildings are projected. The residents of the place seeing good times ahead, are taking hold, and with the coming colony, prepare to give 'a long pull, a strong pull, and a pull altogether'. We expect by midsummer to see found a population of from 600 to 800 up there, all driving ahead and thrifty". The hopes expressed for Evans were to be realized. By June 27, 1871, the population of Evans was estimated at more than five hundred, an increase of at least four hundred and fifty in three months; the first irrigation ditches were completed; and for the fiscal week freight receipts had totaled 52,000 pounds, more than double those of Greeley. 2 By September, 1872, the population of Evans had increased to 750. It could boast of "a bank, three large dry-goods stores, a drug store, a furniture store, two blacksmith shops, a harness shop, two good hotels, a bakery, a butcher shop, boot and shoe store, one physician, two lawyers, three surveyors, one real estate firm, one livery, and other classes of trade". 3 That Evans, too, was enjoying a period of prosperity at the same time that Greeley

was beginning to recover from its period of depression may be seen in the crop reports published in the Evans Journal in July, 1874; in the scarcity of houses and the high rents reported in October 1875; and in the successful fight which was waged with Greeley over the county seat.

Third and least successful of the colony attempts at settlement in the present Weld County was that of the Southwestern Colony, or Tennessee Colony, since it was organized in Memphis. The organization of the colony was effected in January 1871, largely through the efforts of D.S. Green of Denver. Colony lands were selected some twenty or thirty miles east of Evans and during the spring of 1871 about one hundred families arrived to occupy them. A correspondent writing in the Rocky Mountain News for June 14, 1871, estimated the number of colonists at the new settlement at some four hundred. An extensive system of irrigation was under construction, the town of Green City had been laid out, while the colonists were enthusiastic over the prospects for the future. In December, 1872, it seemed that the new colony had a fair chance of ultimately succeeding. By September, 1875, the Southwest Colony was obviously on the point of failure; unlike the Union and St. Louis Western Colonies it failed to respond to improving conditions throughout eastern Colorado. "Green City has been unfortunate", said the Greeley Tribune in September, 1875 "in not obtaining water. The town, containing about twenty houses ... stands ... about a mile from the river; some gardens were

planted, but as the water failed, everything dried up. The ditch is long, and though water has been constantly running for several weeks it seems to be absorbed in the sandy soil.\(^1\) Green City and the Southwest colonists gradually came within the sphere of influence of Greeley and Evans and the attempt disappears from Colorado history shortly after 1875.\(^2\)

Contemporary with Evans, Greeley, and Green City were Erie and Platteville, town plats of which were filed in 1871.\(^3\) Erie, located in the southwestern corner, developed into a coal mining center and supplied early Denver with a large part of its fuel.\(^4\) Platteville by 1895 had become "a flourishing agricultural center"\(^5\) but of its earlier history I have been unable to find any information.

From statistics of the U.S. Census for 1870, which are to be preferred to those of other contemporary estimates, it will be seen that by 1870 little progress had been made in subduing that portion of the Great American Desert included within the limits of the present Weld County. In the entire county with its area greater than that of the state of Vermont there was a population of 1636, 1059 of whom were classified as male.

105 farms are enumerated, whose cash value was estimated at approximately $279,000. Farming implements and machinery were valued at $20,000. Crop productions for 1870 were as follows: wheat, 8300 bu.; rye, 2000; corn, 9500; oats, 24,200. $5000 was reported to be invested in coal mining and the value of the coal

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mined was estimated at $2500. The total assessed valuation of all real and personal property was approximately $900,000. The assessed valuation of both real and personal property for the following year was $1,640,350, a substantial gain.¹

From the same source of information let us notice the development in this county during the decade 1870-1880. During this time Colorado had been admitted to statehood, but no division of the large territory included in Weld County had yet been made. Nor could one have been expected for its population in 1880 was but 5646, only 4010 more than in 1870. Of this population 1297 resided in Greeley and 358 in Erie. Since the agricultural population about Greeley and Erie must have been considerable it is obvious that the larger part of this population must have been situated within the limits of the present Weld County. In the entire county there were but 473 farms embracing a total of 79,000 acres of land valued at $1,399,000. Farm machinery and equipment valued at $358,000 was in use on these farms. The value of the produce of these farms was fixed at $641,500. Crop productions for the census year were as follows: wheat, 315,000 bu.; corn, 95,000, oats, 92,500; barley 11,500. Real and personal property were assessed at $4,622,232. Clearly, then, the conquest of the Great American Desert in this county during the eighth decade assumed only slight proportions. Only in the vicinity of Greeley had a really substantial development been made.²

But the next decade was to witness a most satisfactory growth and development in the region of the present Weld County.

By 1890 the territory of the original Weld County had been apportioned among the several new counties in the same arrangement as they exist today. In 1887 the counties of Logan and Washington were created from the eastern part of its territory. The final division was made in 1889 when Weld, Logan, and Washington were subdivided and the counties of Morgan, Yuma, Phillips, and Sedgwick were established. Weld county, i.e. the present Weld county with which we are more particularly concerned, had a population of 11,736, nearly twice that of the original county ten years before. It is interesting to note that of this population 1873 or approximately 16% were foreign born; of this number 509 were English and 274 were Germans. The new towns of Fort Lupton and Windsor had been laid out during this decade and in 1890 returned populations of 113 and 183 respectively. Erie had a population of 662, Platteville 213, and Greeley 2395. Evans which early in its history had given promise of becoming the metropolis of the lower South Platte valley returned a population of only 306; Green City had disappeared from the map.

Weld county had always been essentially an agricultural community and as such has taken high rank among the agricultural districts of the Far West. The U.S. Census reveals not only the substantial development in Weld County from 1880 to 1890 but also something of its relative high standing in various branches of agriculture. By 1890 there were in this county for irrigation Weld ranked only seventeenth. This fact points to the development which had been made in this county in the science of dry farming and further demonstrates the ability...
1225 farms embracing a total of 368,781 acres, 112,080 of which were under irrigation. Their value was fixed at $7,776,000 machinery and farm equipment at $268,500, and livestock at $2,321,750. The value of all agricultural products totalled $1,770,000. Among the 56 counties of Colorado Weld was first in wheat production with 945,000 bushels which was about one third of the entire crop of the state, third in corn with 196,000 bushels, first in oats with 271,000 bushels, and first in barley with 113,500 bushels which was more than one third of the production for the state. As evidence of the diversified character of Weld County agriculture and at the same time of its relative high standing in all branches, it may be noted that it was fourth in wool production with 322,500 pounds, second in milk production with 2,071,000 gallons, second in the total number of cattle with 44,000, first in the number of horses with 32,000, first in the number of chickens with 68,750, and first in the production of honey with 97,500 pounds. By 1890 Weld County's potato crop was already assuming large proportions for its production during that year reached 627,000 bushels which was two-fifths of the crop for the state. Irrigation, to which the Union colonists had given so much attention, had within two decades been extended to the point where approximately 13% of all the irrigated land in Colorado was to be found in Weld County which led the counties of the state in phase of development. But in the percentage of farm land under irrigation Weld ranked only seventeenth. This fact points to the development which had been made in this county in the science of dry farming and further demonstrates the ability
of the Weld County farmers.

In a previous chapter attention was called to the re-
stricted development in parts of the region of the "Great
American Desert" during the decade of 1890-1900. In Weld
County there was not an extensive development during this
same decade but it was nevertheless steady and uninterrupt-
ed. The increase in population from 11,736 to 16,808, was
of course slight, but it is to the credit of the county that
while all of the towns increased in population this rate of
increase was less than that in the farming communities. Of
the 13.7% of foreign born population in the county there were
104 Danes and 385 Germans. In 1900 556,000 acres were in-
cluded in the farms of the county which were valued at $10,094,000.
Upon these farms was farm machinery and equipment valued at
$602,000 and livestock valued at $2,950,000. Nearly 2,000,000
bushels of wheat, or 35% of the wheat of Colorado was produced
in Weld County in 1900 which at the same time produced 11% of
the oats of the state and 29% of the barley of the state. In
1900 2,821,615 bushels of potatoes were produced in the county
which was more than 1% of the entire crop of the United States.
Over 100,000 bushels of onions were also raised which was one-
half of the state crop. In this decade Colorado surpassed
California in the extent of irrigation development and thus
led the United States. Weld increased its irrigated acreage
from 112,080 to 226,613 and as a result continued to lead the
state. Approximately 14% of the irrigated acreage of the state
was to be found in Weld County. That this county had little
interest in manufacturing is to be seen in the fact that the $340,000 which in 1890 was invested in manufacturing had decreased by 1900 to $293,000.

When it is noticed that the density of population for Weld County in 1900 was less than four to the square mile, while that of the state was more than five to the square mile, it appears that the development in the county had not been so appreciable. But there are some significant facts which attest to a marked development in this county by the opening of the present century. Only 14% of the area of Colorado was included in farms in 1900 and but 3% of the area of the state could be designated as improved farm land. By the same census 60% of Nebraska was included in farms, the improved land of which amounted to 62% and included 37% of the total area of the state. In the light of these figures a very creditable showing for Weld County is to be seen in the fact that 22% of the area of the county was included in farms, the improved land of which amounted to 45% and embraced 10% of the area of the county.

In an address before the Colorado Horticultural Society at its annual meeting for 1900, Governor Thomas of Colorado, expressed his appreciation and that of the state, to the members of the society for the instrumentality "in demonstrating the theory that the great American desert is one of the most fertile and productive of all portions of the globe." The record of achievements of the Weld County farmers by 1900 would certainly tend to support the governor's theory. But by 1900 it most certainly had not been demonstrated that the region

1. Annual Report of the State Board of Horticulture (Colorado) for 1900, 7.
of the Great American Desert was one of the "most fertile and productive" of the regions of the earth; nor has it been demonstrated yet today. But by 1900 it is true that in certain portions of the region of the former desert, one of the most important of which was Weld County, real substantial development had been made which had assumed extensive proportions.

In accounting for the phenomenal growth and development of Weld County there is opportunity for the moral lesson. We noted the refusal of the Union Colony locating committee to locate at Evans because it had saloons. Max Clark humorously tells how the outraged colonists burned down the only saloon that ever dared open for business in their midst. Occasional witticisms directed at the virtue of the people of the Greeley district may be found in the contemporary newspapers. Said the Rocky Mountain News in its issue for June 23, 1875, "after spending $2000 for a jail, Greeley has nobody to keep in it, and the people are regretting that the money wasn't loaned at 2% and the proceeds invested in Sunday School books". The attempt of the Union colonists, who were the real founders of Weld County, represented an effort of a home-making people, both to enjoy landed independence and social and intellectual privileges equal to those of the towns and cities which they had left. Greeley and the present Weld County might be said to be the creation of the town meeting. Among its first buildings was Colony Hall and among its first organizations was the Lyceum, in which all the affairs of the community appear to have been debated

with a fervor and fearlessness worthy of Horace Greeley's following. It is to the credit of the colonists that they adopted cooperation in the construction and management of public utilities, of which their irrigation system was the first and most important. The best methods of agricultural practice were sought out through much experimentation until Greeley and its products grew famous together. This point is perhaps no better illustrated than in the long period of experimentation which was necessary before they were able to make irrigation successful.  

Patient earnest effort on the part of intelligent, courageous people made possible the success of their pioneer enterprise and laid the foundation for Colorado's present agriculture in a portion of the desert-like Far West, long believed unfit for human habitation. Too much credit perhaps can not be given to the spirit of those founders of Weld County. Meeker himself expressed it perhaps best, only a short time before his death in the following words: "After all ... although the enterprise yielded me nothing in return, in a worldly sense, yet I am proud to have been the leader in such a movement; it will be counted an honor to every man who took part in the settlement of Greeley. I am more than compensated in the grand success of the undertaking, and I have nothing to regret".  

To a large extent this same spirit and this same intelligent and industrious labor of a strong people have made possible the Weld County of today - have clearly demonstrated the potential worth of the once "Great American Desert".  

The growth and development of Weld County along all lines from 1900 to 1910 were extraordinary. A few facts will tend to show this. Population increased from 16,808 to 39,177, an increase of 133%. There had been an increase in the number of acres in farms from 556,000 to 914,000, 410,500 acres of which were improved. 15.4% of the entire area of the county was by 1910 under irrigation. All farm property for the state was valued in 1910 at $491,472,000 and that of Weld County at $56,363,000 or approximately 12% of that of the entire state. The potatoe crop which in 1900 had totalled nearly three million bushels had been doubled by 1910, when in that year 5,857,691 bushels were raised. This decade saw the introduction of sugar-beet growing on an extensive scale in Colorado. 1,231,500 tons were grown in the state in 1910, 32% of which were grown in Weld County. Approximately 7% of Colorado's dairy products in 1910 were credited to Weld County.

In the decade of 1910-1920 Weld County's growth and development maintained its steady pace. But by 1920 this county was far from that point where it might be said to have reached its maximum agricultural development. In the following comparison between Weld County and Marshal County, Iowa, which has been chosen because it represents a typically agricultural community which appears to have reached its maximum agricultural development, Weld County's actual progress can be better appreciated and some conception gained of the development of which the county is yet capable. The area of Marshal County is about one eighth that of Weld. In 1920 it reported a population of 32,630 with a density of 57 per square mile, while
Weld reported a population of 54,059, with a density of only 13.4 per square mile. Evidence that Marshal County had reached its maximum agricultural development by 1920 or some short time earlier, is revealed in the fact that its population during this decade decreased one tenth of 1%, and in the further fact that although it was an agricultural community whose rural population had a density of 29.5 per square mile, yet the density of the county as a unit was 57. The increase in Weld County's population for this same decade amounted to 38% and the density of the rural population was 10.7 while that of the entire population was 13.4. The comparison between these two counties can probably best be shown by submitting the comparative data in tabular form.

Comparative data on the agricultural development of Marshal County, Iowa, and Weld County, Colorado, for 1920.

<table>
<thead>
<tr>
<th></th>
<th>Marshal County</th>
<th>Weld County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of all farm property in dollars</td>
<td>$109,390,000</td>
<td>$134,878,500</td>
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<tr>
<td>Value of farm implements and machinery</td>
<td>3,872,000</td>
<td>7,194,500</td>
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<tr>
<td>Value of all livestock</td>
<td>7,132,000</td>
<td>15,434,500</td>
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<tr>
<td>Value per farm in dollars</td>
<td>47,253</td>
<td>23,396</td>
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<td>Value of land and buildings per farm</td>
<td>42,499</td>
<td>19,471</td>
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<td>Value of land per acre</td>
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<td>Per cent of land in farms</td>
<td>96.70</td>
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<td>Per cent of farm lands classified as Improved</td>
<td>90.50</td>
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<td>Average number of acres per farm</td>
<td>152.90</td>
<td>304.80</td>
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<tr>
<td>Average number of improved acres per farm</td>
<td>138.30</td>
<td>152.40</td>
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<tr>
<td>Per cent of farms operated by owners</td>
<td>52.60</td>
<td>63.80</td>
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<td>Number of horses</td>
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<tr>
<td>Number of cattle</td>
<td>51,443</td>
<td>106,827</td>
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<tr>
<td></td>
<td>1925 Value</td>
<td>1920 Value</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Value of cattle in dollars</td>
<td>3,089,500</td>
<td>7,063,000</td>
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<tr>
<td>Number of swine</td>
<td>88,950</td>
<td>37,083</td>
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<td>Total value of poultry and bees</td>
<td>7,366</td>
<td>35,254</td>
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<tr>
<td>Number of gallons milk produced</td>
<td>3,753,000</td>
<td>6,844,000</td>
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<td>Total value of all cereals grown</td>
<td>10,687,000</td>
<td>5,226,000</td>
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<tr>
<td>Total value of other grains and seeds</td>
<td>8,515,500</td>
<td>553,000</td>
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<tr>
<td>Production of corn in bushels</td>
<td>4,881,000</td>
<td>225,500</td>
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<td>Production of oats in bushels</td>
<td>2,064,000</td>
<td>338,500</td>
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<td>Production of wheat in bushels</td>
<td>164,000</td>
<td>1,995,500</td>
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<tr>
<td>Production of alfalfa in tons</td>
<td>231,500</td>
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</table>

This table shows without need of explanation the extent to which Weld County is yet capable of development. But it may be suggested that because of natural handicaps such as a lack of water for irrigation and insufficient rainfall that such a maximum development as that in Marshal County, Iowa, can not be attained in Weld County. And there is abundant evidence which tends to prove that since 1920 no progress has been made in the continued development of Weld County. But this fact is to be explained in the severe economic conditions that have prevailed throughout the United States during the last five years, and which have seriously affected the agriculturists in practically every region.

By 1920 there had developed some manufacturing in the county. The U.S. Census enumerates 98 manufacturing establishments for this year which employed 794 wage earners and whose products were valued at $9,744,000. Thus Weld County
Thus Weld County ranked fourth among the counties of Colorado in this respect, being surpassed by Denver, Pueblo, and Larimer counties respectively. Mining in Weld County has in late years come to assume considerable importance although it is limited to the production of coal. In 1919 659,000 tons were mined, the following year the production increased to 945,000 tons, in 1921 more than a million tons were mined, and in 1922 the production reached 1,467,500 tons.¹ In this field of enterprise Weld ranks third among the counties.

There is what may be called a social aspect of Weld County's development which should be considered. In education Weld County leads the state. More revenue is made available for public school education by this county than by any other county in the state, Denver County not excluded. In the number of high schools, centralized schools, and consolidated schools Weld stands first, a position which it has retained at least since 1903.² However, illiteracy is relatively high in Weld County, but this is to be explained by the large number of Mexicans who have been brought into the county by the sugar beet industry. This leads to a consideration of the composition of the present population of the county. According to the U.S. Census for 1920 but 83% of the county's population is of native born white stock. 15.2% of its population was composed of foreign born whites which included 38 Dutch, 56 Norwegians, 159 Scotch, 170 Danes, 367 English, 1.Golden Year Book. 2. Ely, "A Study of a 'Decreed' Town." Harper's Magazine CVI, 390-401.
501 Germans, and 930 Swedes. It would be interesting to determine to what extent these sturdy north Europeans have contributed to the development of this county throughout its entire history. An index to the stability of any agricultural community may be found in the amount of its bank deposits. With the close of business on December 31, 1923, the banks of Weld County reported deposits which totalled approximately $8,601,000. With this figure Weld County ranked third in the list of Colorado counties, being surpassed only by Denver and Pueblo counties. Then the amount of money which a community expends on its highways is taken today as an indication of its prosperity and its progressive spirit. For the year 1923 Weld County led the others of the state by a wide margin in the amount of money appropriated for highways. Approximately $416,000 was made available in the county for its highways, an amount which represents 8% of the total amount of all revenues available for the construction and maintenance of highways in the state for that year. ¹ The number of motor vehicles operated in a community is perhaps not an index to the substantial qualities of the community; however that may be, statistics reveal the fact that exclusive of Denver, Weld County leads the state in the number of motor vehicles in operation. ² In his interesting study of Greeley, the well known economist, Dr. Ely, has called attention to the various social aspects in connection with the growth and development of that town and its supporting community. ³

Our study of Weld County should include surveys of at least three of the county's representative industries. For this purpose dry farming, which because of its unique character really represents a distinct industry, potato growing, and the sugar beet industry will be considered.

Dry farming is defined by the Colorado Agricultural Experiment Station as "the production of crops without irrigation, in a region where the rainfall lies between the approximate limits of 10 to 20 inches per annum". Successful dry farming depends upon first of all the proper adaptation of crops, secondly upon the finding of the principles of the movement of water in the soil, and thirdly upon an understanding of the principles of moisture conservation. "Dry farming at its best is serious business", states the Colorado Experiment Station. The production of crops is always more or less of an uncertainty. Yet despite its risks and handicaps dry farming has developed into a considerable industry, not because of the fact that it is practically the only industry of certain portions of Colorado and other western states, but because it is contributing a creditable share to the agricultural production of the West and making homes and a living possible for several thousands of people.

Since Weld County has a normal annual rainfall of from 13 to 16 inches, all agriculture practiced in the county without the aid of irrigation may be classified as dry farm-

1. Bull. 227 of the Colorado agricultural Experiment Station. 2. Ibid. 3. Ibid, 16. 4. See rainfall map in pocket of the Colorado Year Book for 1923.
ing land. Upon four-fifths of the farm land of the county dry farming was being practiced in 1920. Unfortunately for our purpose there is no information concerning the distribution of farmers, farm values, and farm products according to the irrigated or non-irrigated character of the land of the county. However, the Census for 1920 has estimated the percentage of the total value of each crop for the entire state which was raised on irrigated land. From this we learn that 87% of the corn of the state of Colorado in 1920 was grown on non-irrigated or dry farming land; \(^1\) likewise that 81.2% of the winter wheat, 34.7% of the spring wheat, 50.6% of the barley, and 96.5% of the rye were grown on dry farming land. However, only 11.9% of the alfalfa, 12.3% of the timothy and clover mixed hay, 15.8% of the potatoes and 15% of the sugar beets were grown on dry farming land. If these figures for the state are now applied to Weld County it will be observed that the one-fifth of the irrigated farm land of the county is of considerable more importance than is the four-fifths of dry farming land. But it is possible that these figures can not fairly be applied to Weld County, because of the greater development in the science of dry farming in that county. \(^2\) At any rate dry farming is making it possible for a considerable number of people to have homes in the northern and eastern portions of Weld County and to turn

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1. While all non-irrigated lands in Weld County are dry farming lands, this is not true of the entire state for there are portions which have a rainfall greater than 20 inches. But since these are for the most part in the non-producing mountainous parts of the state they need not be considered here.

2. This statement is based on an interview with Mr. W. G. Deming, Superintendent in charge of field crops at the Colorado Experiment Station, which I had in October, 1924.
much of the large acreage of less desirable lands to the agricultural benefit of the county and state. Among the precincts of the county which owe their existence in a large measure to dry farming and the location of their small towns from which they take their names to the various railroads, are Carr with a population of 394, Nunn with 810, Ault with 783, and Pierce with 747, all of which are on the Union Pacific between Greeley and Cheyenne, Wyoming. On the C.B. & Q between Cheyenne and Sterling are Raymer with 864 and Grover with 1964. Between Denver and Fort Morgan on the C.B. & Q, there is Roggen with 610.

An important industry and one which has tended in past years to make Weld County famous is the growing of potatoes. Before Greeley was founded immense crops of potatoes were being grown in the valley of the Big Thompson by the old settlers. When the Union colonists began practicing agriculture about their town of Greeley, they, too, began growing potatoes and at first were quite successful. But the ravages of rust, scab, and the Colorado potato beetle proved serious handicaps in a few years, and almost threatened the existence of the industry. It was only after persistent effort on the part of the Weld County farmers that they learned to overcome these handicaps and to make full use of the natural advantages which their county afforded them for potato growing.

1. These figures are based on figures of 1910 Census. The Census of 1920 does not list the population of Minor divisions. 2. Boyd, History of the Union Colony, 154. 3. Ibid, 155. 4. Ibid.
A bulletin issued by the Colorado Agricultural Ex-
periment Station in November 1910, states that "the major
part of the potato production of the state is confined to
the Greeley district, which embraces approximately 250,000
acres". This district, continues the bulletin, centers about
Greeley but extends along the Platte river to the edge of
the state. The natural advantages of this district for
potato growing are given in this same bulletin and include
the high altitude which is the native habitat of the potato,
the abundant sunshine so essential to plant growth, the pe-
cularly favorable character of the soil, and the favorable
geographical location of the district. 1

In 1890 Boyd wrote that for the last five years the ship-
ments of potatoes from Greeley and Eaton, also in Weld County,
near Greeley, "have run from 1000 to 1800 carloads" and that
the average price during this period had been "somewhat be-
low $1.00 per hundred pounds". 2 On this basis he estimated
the value of the Weld County potato crop at a quarter of a
million dollars annually. The total cost of digging, sort-
ing, sacking, delivering at the station, shipping, and marketing
was estimated by Boyd at twenty-five cents per hundred weight.

In February, 1903, Dr. Ely, Professor of Economics at the Univer-
sity of Wisconsin, stated that the "chief source of wealth in
Greeley up to the present time has been the potato". It was
claimed, he said, that nowhere else in the United States was
there so large a production per acre of potatoes of high qual-

ity as in Weld County. This was probably correct, for the Colorado Agricultural Experiment Station in 1910 stated that one-half more potatoes per acre were produced annually in Colorado than in any of the other great potato producing states. An eighty acre farm, said Ely, had been known to produce as high as $10,000 worth of potatoes in a single year. Although land in Weld County in 1903 was selling at from $75 to $150 per acre, "it has again and again happened that a man has paid for his farm in one crop." So highly was the potato regarded in Weld County that in the nineties there was held an annual celebration on the order of the Harvest Home, which was known as 'potato day'. This institution, however, was discontinued in the early part of the next decade because the people about Greeley feared that their industry might be attracting too much attention which would work to its disadvantage.

While in recent years the potato crop of Weld County has been somewhat smaller than in former years it has nevertheless remained considerable both individually and relatively as may be seen from the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres Planted (Weld)</th>
<th>Percent Bushels Produced (Weld)</th>
<th>Per Cent. (State)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1917</td>
<td>18,000</td>
<td>22</td>
<td>3,121,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,325,500</td>
</tr>
<tr>
<td>1919</td>
<td>21,000</td>
<td>23</td>
<td>2,261,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,095,500</td>
</tr>
<tr>
<td>1921</td>
<td>24,000</td>
<td>24</td>
<td>2,907,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12,367,000</td>
</tr>
<tr>
<td>1923</td>
<td>23,500</td>
<td>26</td>
<td>3,043,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11,822,000</td>
</tr>
</tbody>
</table>

Of much importance in Colorado and particularly in Weld County is the sugar beet industry. This history of the industry is comparatively short and for the most part confined to the present century. But in the late nineties considerable interest was developing among the farmers of eastern Colorado in the possibilities of growing sugar beets. ¹

A bulletin issued by the Colorado Agricultural Experiment Station in March 1897, prompted by this interest, pointed out the favorable climatic and soil conditions of eastern Colorado for the growing of sugar beets. Moreover, it estimated that at least 15,000 acres of beets might be grown annually to supply Colorado with its own sugar. ² In February, 1898, there appeared a second bulletin which carried a detailed report on certain experiments that had been made in the growing of this crop. This also suggested the possibilities of growing beets for sugar. ³ The acreage of sugar beets gradually increased during this time and by 1899 the first sugar factory in Colorado was built at Grand Junction. ⁴ The next two factories were built in 1900 and 1901 respectively in the Rocky Ford district in the Arkansas valley. ⁵ A second factory was built in 1901 and this was located in what is now known as the Greeley district. The factory, however, was erected at Loveland, just across the Weld County line in Larimer County. ⁶ The following year, 1902, factories were built at Greeley and Eaton. In 1903 the Longmont factory was built.

¹ Colorado Agricultural Experiment Station, Bulletin 36.
² Ibid., 4-5.
³ Ibid., Bulletin 42.
⁵ Ibid.
⁶ Ibid.
near the Weld County line in Boulder County.\(^1\)

The twelfth census was the first to collect statistics on the sugar beet industry and the state was used as a unit.\(^2\) According to this California led the United States in the total acreage devoted to beets with 41,000. Colorado's acreage was only slightly more than 1000.\(^3\) However, by the time of the Government survey of the sugar beet industry in 1916-17 Colorado was leading the United States and producing approximately three-tenths of the entire sugar beet crop.\(^4\)

Of the seventeen sugar factories in Colorado in 1917, ten were in the northern district and centered about Greeley; three of these were in Weld County, and two others were immediately across the county line in adjoining counties.\(^5\)

Colorado's sugar beet crop in 1919 according to the U.S. Census amounted to 1,231,500 tons and of this amount 392,000 tons were produced in Weld County, which led the counties of the state. The Census for 1920 credited Colorado with producing 1,658,000 tons of sugar beets in 1919, 565,000 tons of which amount were produced in Weld County which again led the state.

Few parts of the old "Great American Desert" have attained a development comparable to that of Weld County in eastern Colorado. The future may not see many of these reach that point in their development where they may compare favorably with the Weld County of the future. There are differences in native resources, natural handicaps, and...

populat background that must always affect to some extent the relative development of all parts of the former "desert". What has been accomplished in Weld County in the way of growth and development may be considered as indicative of what may be some day accomplished in most parts of the region once known as the "Great American Desert". To the student of western history Weld County may serve as a measuring stick by which the process of growth and development may be estimated for all portions of the semi-arid West. Moreover, the student of western history may study the achievements of the people of Weld County as representative of one of the most earnest attempts on the part of serious minded and intelligent people to make of the unhospitable Far West a land of comfortable homes and prosperous citizens.
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