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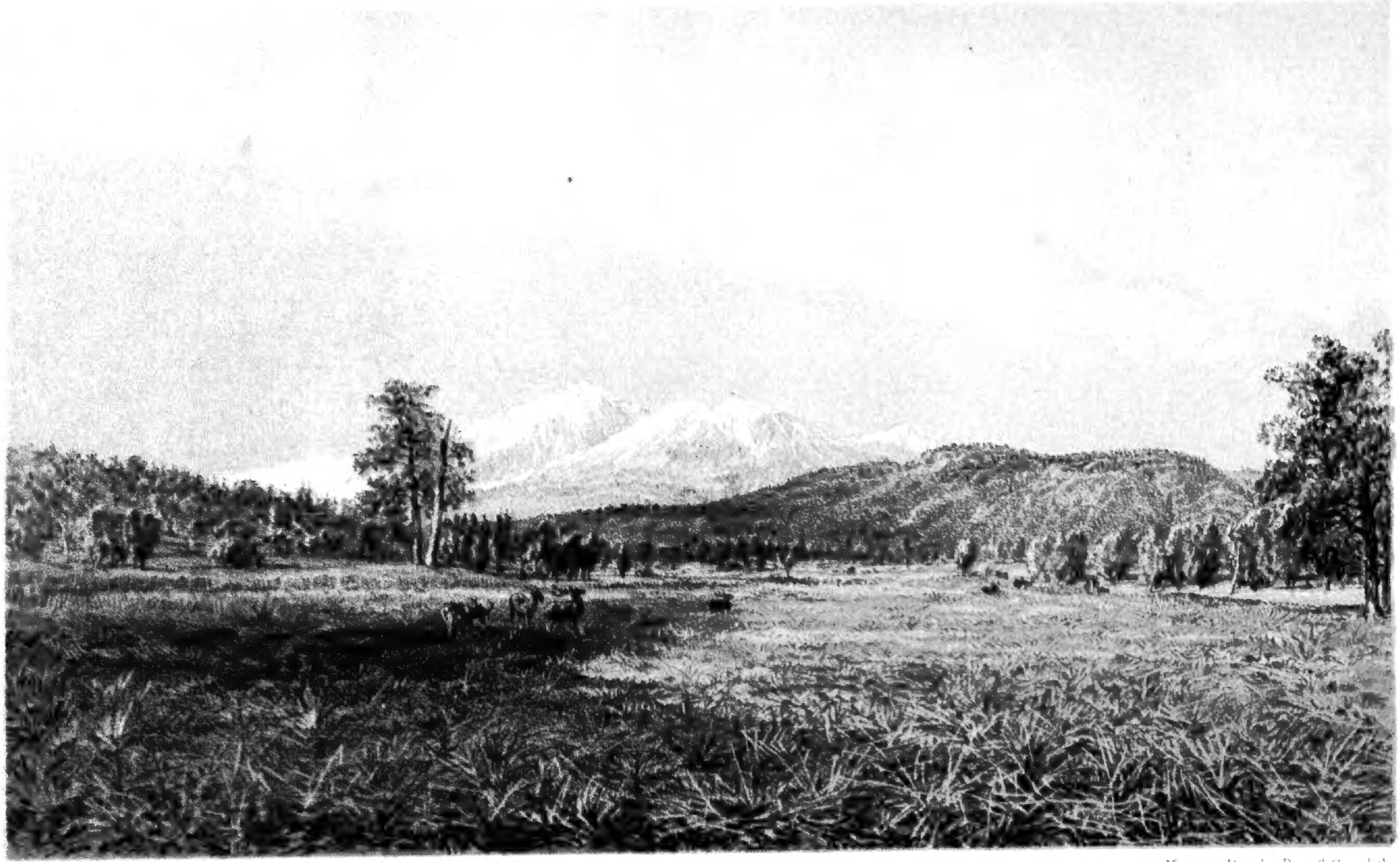
NEW TRACKS IN NORTH AMERICA.

VOL. I.



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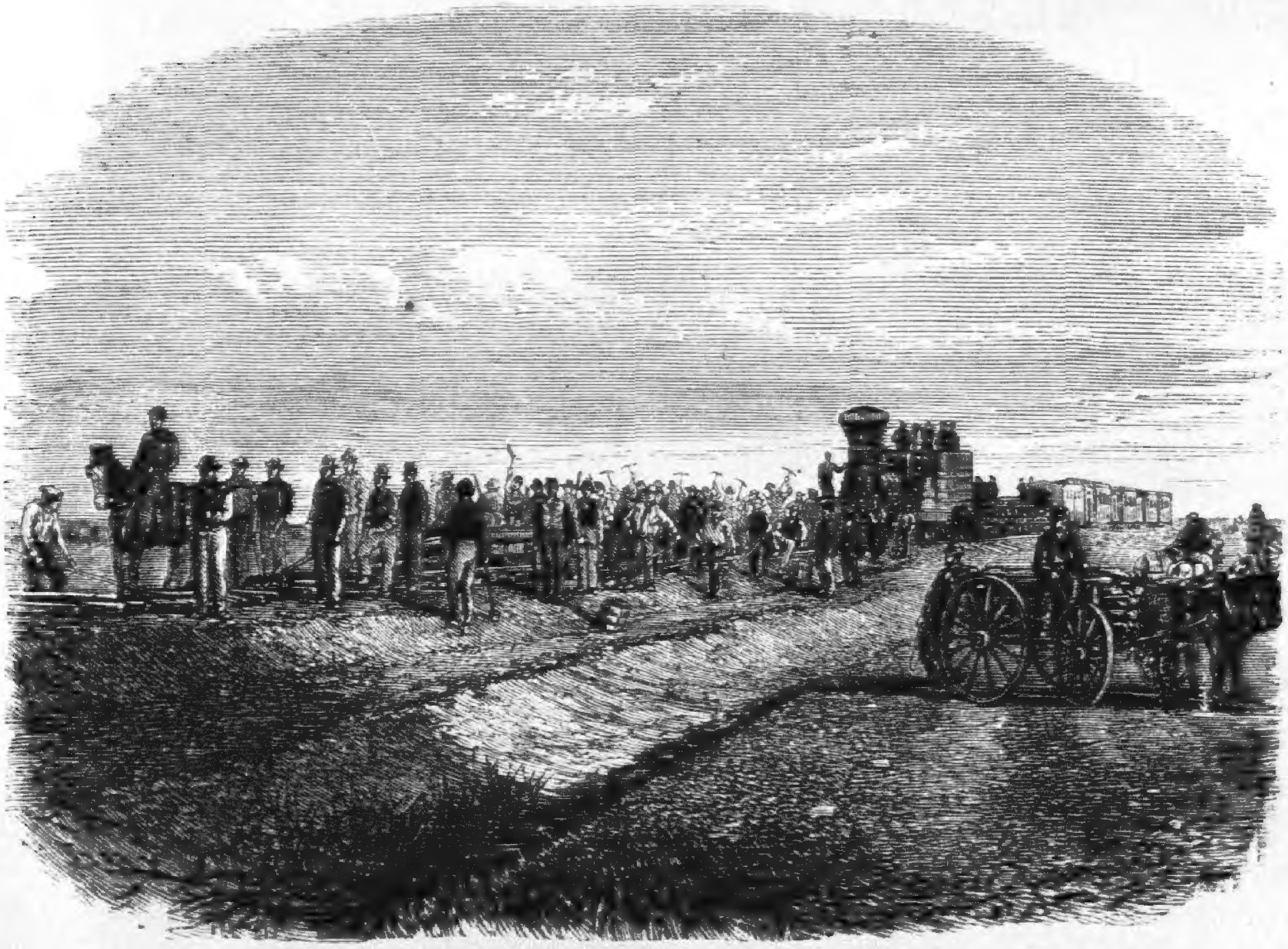
NEW TRACKS IN NORTH AMERICA.

A Journal of Travel and Adventure

WHILST ENGAGED IN THE SURVEY FOR A SOUTHERN RAILROAD TO THE PACIFIC OCEAN DURING 1867–8.

BY WILLIAM A. BELL, M.A., M.B. CANTAB.,

FELLOW OF THE ROYAL GEOGRAPHICAL AND ETHNOLOGICAL SOCIETIES.



Laying the Track.

IN TWO VOLUMES.

VOL. I.

LONDON:
CHAPMAN AND HALL, 193, PICCADILLY.
1869.

MISSOURI
BOTANICAL
GARDEN

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LONDON:
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This Book

I DEDICATE TO MY FATHER IN ENGLAND,

AND TO

GENERAL W. J. PALMER, OF ST. LOUIS, IN AMERICA.

To General W. J. Palmer.

My dear General,

It gives me great pleasure to associate my Father's name with that of the most valued of my American friends, whose intercourse contributed so much to make my sojourn in the Far West a period to which I shall ever look back with the brightest recollections.

Believe me to remain,
My dear General,
Ever yours very sincerely,
W. A. BELL.

New University Club,
St. James's Street,
May 15th, 1869.

PREFACE.

In placing this book of travels before the public there are some points to be explained, some indulgencies to be asked for, and many friends to be named whose assistance merits my warmest gratitude.

It is right at the outset to remind my readers that they must not criticise a book of travel too severely as a literary production. Whilst the novelist and the historian are always using their pen, the traveller of necessity isolates himself from all literature, and yet when he does write he finds numbered amongst his readers the man of science, the lover of adventure, and the practical public. In order, if possible, to make the following pages acceptable to all, I have tried to arrange my subjects in such a way that any special topic can be omitted without difficulty by those whom it does not interest.

The success with which the Royal Geographical Society has for years been conducting its meetings has made that branch of science quite popular, at least amongst the reading public of London. I feel, therefore, that no apology is necessary for having devoted the first fifty pages to Physical Geography, pure and simple. In like manner another fifty pages at the end of the first volume have been given to Ethnology—to a terse account of aboriginal tribes, well worthy of study. As the different races of man are at the present time occupying much public attention, this will, I trust, be acceptable.

I have been in considerable perplexity as to the best way of treating the bulk of my narrative, chiefly because it was impossible to forget the fact, that whatever interest the book might excite would be shared by the American as well as the English reader. I have used many words which are foreign to ourselves; I have often transgressed in like manner the ordinary phraseology of our Atlantic cousins. I have also borne in mind from the commencement, and indeed it was impossible for an eye-witness to forget, that the country of which I treat, though it is almost without tillage or inhabitants, is not like Africa, Central Asia, or even South America, in being far removed from the present limits of Anglo-Saxon occupation; but that it contains cradles for nations which are destined to spring from our own hardy and prolific stock, and that practical and special knowledge about it is desired, in the first place, by the Americans themselves; in the second place by our own nation, supplying, as it does, at least two-thirds of the emigrating population of Europe.

In reading some of the chapters in the second volume, it must not be supposed that because the scenes there related are unusually strange, they are of necessity highly coloured, for this is not the case. I have kept closely to fact throughout, and even in choosing my illustrations have taken great pains that everything should be true to nature. Here and there a figure has been introduced by the artist, but with very few exceptions all are exact copies from photographs taken on the spot.

My best thanks are due to Dr. John Le Conte, of Philadelphia, through whose personal influence I became a member of the expedition to survey a route for the Southern Trans-continental Railway.

To Mr. Aubrey Smith, of Philadelphia, I am indebted for having taken charge of my little botanical collection; for having, with infinite trouble, obtained the names of nearly all the plants from the most distinguished botanists in the United States; and for having sent them to me, thus named, in the best possible condition.

General Palmer, of St. Louis, has not only given me access to all the documents connected with the railway survey, and offered me all possible assistance, but he has contributed one of the most thrilling incidents related in the following pages. These services, however, I value as nothing compared with the warm friendship which our travels together have matured.

To Captain Colton I offer my best thanks for the valuable contributions which, true to his promise, he has sent me relative to a district over which I did not pass.

I gratefully acknowledge the service rendered to me by Mr. John Browne, of Philadelphia, who, as an amateur, has acquired a high reputation amongst photographers. Mr. Browne not only initiated me into the art, but sent out after me all the necessary instruments and chemicals.

It is with great pleasure also that I thank Major Calhoun and Dr. Parry for their valuable contributions, both in the field of adventure and science.

Lastly, I shall not soon forget the debt of gratitude I owe to my fellow-countryman and friend Mr. R. K. Cautley, whose assistance during the production of this book has been unceasing.

W. A. BELL.

18, HERTFORD STREET,
MAYFAIR, LONDON,
May, 1869.

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NEW TRACKS IN NORTH AMERICA.

INTRODUCTION.

I.

SKETCH OF THE ROUTE.

In the spring of 1867 a very extensive surveying expedition was organised by the Kansas Pacific Railway Company, in order to determine upon the best route for a southern railway to the Pacific coast through Kansas, Colorado, New Mexico, Arizona, and the southern part of California. Until the Rio Grande del Norte (about equidistant from the Mississippi and the Pacific) had been reached, three separate surveying parties were required; but between that river and the Pacific coast, no less than five parties, each capable of making an accurate instrumental survey, were employed, and crossed that part of the continent by different routes on ifferent parallels of latitude. The United States Govern- ient, by furnishing escorts and transportation, rendered ssistance without which such an undertaking would at that ime have been impossible, for most of the Indian tribes vere at war with the whites.

Through the kindness of some of my friends in Phila- elphia, I became attached to this expedition; but not until all the vacancies but one had been filled up. A photographer alone was wanted; and as no idle man could be allowed amongst the party, I accepted the office with, I must confess, considerable diffidence, as only a fortnight remained before starting to learn an art with which I was then quite unacquainted. After we had been in the field but a short time, the return home of the physician of the expedition left that post open to me. It proved to be almost a sinecure, for the healthy life we led in such a glorious climate was far better than physic. Thus it happened that, taking no part in the actual surveys, I was able to move hither and thither, to travel sometimes with one party, sometimes with another, and to take long journeys independently through regions hitherto almost unknown, but which, from their position, were of great importance to those interested in the success of the trans-continental railway.

The distance I travelled beyond the pale of civilisation and railways was about 5,000 miles; this distance, however, was but a fraction of the combined lengths of route surveyed and examined by the separate parties. I now proceed to give an outline of these routes.

From St. Louis, the starting-point, we went by rail to Salina (Kansas), the terminal depôt at that time of the Kansas Pacific Railway. At this point, 471 miles west the Mississippi, we exchanged the locomotive for the mu train, and marched due west over a sea of grass for 21 miles to Fort Wallace, a military post on the borders of th State of Colorado.

On this vast plain the buffalo are still very abundant After a delay of a fortnight at Fort Wallace, caused b the hostility of the plain Indians, we commenced our surve at that point, and proceeded in a south-westerly directio across a desert region to the Arkansas River, and up that stream to New Fort Lyon, a point close to the mouth of the Purgatoire River. Distance, 114 miles.

From Fort Lyon one of our parties continued to ascend the Arkansas River until it reached a tributary called the Huerfano, which it followed into the most elevated portion of the North American continent—the centre of Colorado—where the Arkansas, Rio Colorado of the West, Platte, and Rio Grande del Norte have their sources. Having surveyed several passes in this region, the party descended the last-named stream for about 380 miles to Fort Craig, in southern New Mexico.

Two parties, to one of which I was attached, surveyed a route from Fort Lyon up the Purgatoire River, and across the Raton Mountains to Los Vegas, 230 miles; thence around the southern extremity of the Rocky Mountains into the valley of the Rio Grande del Norte, and down that valley from Albuquerque to Fort Craig, 219 miles farther. In the valley of the Rio Grande, the fast-disappearing remnants of the Aztec nation—the Pueblo or Town Indians—are still to be found living in peaceful simplicity in their villages, and raising their fruits and crops by a well-regulated system of irrigation.

At Fort Craig our parties were reorganised, their numbers reased, and the escorts doubled, preparatory to exploring more difficult country lying to the westward.

From the Rio Grande to the Rio Colorado of the West, and nce across the desert, or Great Basin, as it is commonly led, into California, our parties surveyed and examined o entirely different districts, lying parallel to each other, t separated by lofty mountains and table-lands, and distant ally about 2°. One party, consisting of three bodies of surveyors, passed into California through the Moqui (a semi-civilised race of Indians) country and Northern Arizona,—a land abounding in wild and beautiful scenery, and studded all over with the ruins of a large native population now extinct.

This country was explored some years since—first by Whipple (1854-5), and afterwards by Beal (1858). It lies about the 35th parallel of latitude, and is known as the 35th parallel route across the continent.

The other part of our expedition, consisting of two surveying parties, continued to descend the Rio Grande valley for seventy-two miles below Fort Craig before turning westward. They then explored the barren districts lying between the Rio Gila and the boundary of Mexico. As the 32nd parallel of latitude traverses this region, the route through it is called the 32nd parallel route.

After visiting many places of interest in New Mexico, I took the 32nd parallel route, and travelled with one or other of the parties to Camp Grant, in the centre of Arizona. In this distance, which by the continuous line surveyed by one party was found to be 345 miles, we crossed many mountain ranges, traversed the Great Madre Plateau, and passed through a gorge—the Aravaypa Cañon—of unusual grandeur and interest. I left the surveying parties at Camp Grant, and travelled, with a single companion as guide, in almost a due southerly direction for 600 miles, through the State of Sonora, in Mexico proper, to the port of Guaymas, in the Gulf of California. The object of this trip was to obtain much general information as possible respecting that Sta especially as to its mineral and agricultural merits, and feasibility or otherwise of constructing a branch rail through it to Guaymas. After visiting Carmen Island, Paz, and Mazatlan, in the Gulf, I sailed northward to San Francisco, where, in course of time, all our surveying parties collected.

About the middle of February, 1868, I started afresh from San Francisco, and recrossed the continent about the 41st parallel of latitude. The Sierra Nevada and Rocky Mountains were this time crossed in the depth of winter; the desert or Great Basin was traversed at a part where it is 700 miles wide. I visited the Comstock lode, the largest silver ode yet discovered, and other mining districts in "The Basin;" I passed through Great Salt Lake City, thence visited Denver, and finally completed the circle of travel by striking my old route at Fort Wallace. As the greater part of this return-journey was made by the well-known overland route through Nebraska, Utah, and Nevada, I have thought it unnecessary to give a detailed description of it, but have endeavoured to contrast fairly this strip of country with those over which our parties passed about the 35th and 32nd parallels respectively.

The accounts of adventure, Indian fights, &c., scattered through the following pages, are, with a few insignificant exceptions, the unvarnished recitals of events in which we ourselves took part or were closely connected.

Several articles, upon districts surveyed by our parties, but ot visited by me, have, through the kindness of friends, een contributed to this book. One article describes the untry from Camp Grant, where I left my friends, westward the Pacific Ocean; another gives an account of the passage the Great Cañon of the Colorado by a man named James ite, whom some of the members of the expedition met at t Mojave, a point south of the mouth of the cañon; in Appendix will be found an article written by our botanist, together with a catalogue of plants indigenous to the regions traversed by us, dried specimens of the greater number of which I have been able to collect and place in the Botanical Department of the British Museum. Another friend has given me his assistance in describing the 35th parallel route, along which I did not pass.

I have explained the physical geography of the country west of the Mississippi, across which the Americans are constructing two, if not three, trans-continental railways, at some length, and have placed it at the end of this Introduction, because I desire that those of my readers who are especially interested in the Western country should carefully read it before commencing the narrative.

When in the following pages mention is made of the Southern or the Kansas Pacific Railway, the same railway will be implied, viz., that formerly called the Union Pacifi Railroad, Eastern Division, now being constructed throug Kansas, Colorado, New Mexico, Arizona, and the souther part of California to San Francisco. When the central rout or railway is referred to, then that Union Pacific Railwa which passes by Salt Lake, through Nebraska, Wyoming Utah, Nevada, and California to San Francisco must b understood. Farther north still, a third line is in contemplation, uniting the waters of Lake Superior with the Pacific a Portland and Seattle. This railway is known by one nam only—the Northern Pacific Railroad.

The last chapter is devoted to railway topics and emigr tion, and is intended to explain the *modus operandi* of Pac railway construction in the United States—a subject whic present is attracting considerable attention. In a s country like England, railways are, comparatively spea a luxury, and are only carried through districts suffici populous to warrant their construction; but in the great West, where continuous settlement is impossible, where, instead of navigable rivers, we find arid deserts, but where, nevertheless, spots of great fertility and the richest prizes of the mineral kingdom tempt men onward into those vast regions, railways become almost a necessity of existence—certainly of development; and the locomotive has to lead instead of follow the tide of population.

II.

GENERAL FEATURES OF THE MISSISSIPPI BASIN, AND OF THE WATERSHED OF THE ROCKY MOUNTAINS.

The Country east of the Mississippi.—The Basin taken as a whole.—The rise of the Country from South to North; from East to West.—The "Summit Plateau."—The Table-lands lying between the Summit Plateau and the Sierra Nevada.—Physical Geography of California.—The Rocky Mountains.—The Dual Main Chains.—The Central Parks.—Primary "Divides" or Water-partings.—Sources of the Great Rivers, the Missouri and Tributaries, the Columbia, Rio Colorado, Arkansas, Rio Grande del Norte.—The General Features of the Districts through which the Three Great Railways are to pass are especially noticed.—The term Rocky Mountains ought to be limited to the Mountain Ranges only which rise from the "Summit Plateau."

The United States, or rather the great central division of North America, is divided into three nearly equal parts by the Mississippi River and the so-called Rocky Mountains. The average width of each division is about 15°, or 1,042 miles; so that the Atlantic is separated from the Mississippi, which runs nearly north and south, by a belt of country usually not much more than 1,000 miles across, while the Pacific Ocean is double that distance from the Mississippi. *The entire Central third* of the country, with the small exception of Southern Texas and part of New Mexico, is drained by Western branches of the Mississippi, viz., the Minnesota, Des Moins, Missouri, Arkansas, Red River, and their tributaries. The area of territory thus drained is about 1,231,000 square miles (geographical), an extent of surface six times as large as France. Of the *Eastern third* scarcely a quarter is drained by tributaries of the Mississippi; for the Appalachian range limits its basin on the south-east, and the highlands parallel to the great lakes separate it towards the north and north-east from the latter, and from the basin of the St. Lawrence, leaving a triangle scarcely larger than France to supply the great tributaries of the Ohio River.

The *Western third*—that is, of the country between the Pacific Ocean and the Rocky Mountains—is so cut up by mountains, that we shall leave the consideration of its drainage for the present.

The physical geography of the Western two-thirds, which consists of the country west of the Mississippi, is peculiar, although by no means complicated, and will exclusively occupy our attention.

I will first indicate the general rise of these regions, from the Mississippi on the east and the Pacific on the west, to their lofty central elevations, and then discuss the several mountain systems which have been upheaved by forces very different, both in degree and mode of action, from those which uniformly raised the entire country from its bases to its centre.

From the Gulf of Mexico, where the elevation is nil, passing northward up the Mississippi, we do not rise more than 470 feet during the 1,202 miles from the mouth of the river to St. Louis.

During the next 730 miles, up to St. Paul, the rise is again nearly 470 feet. The falls of St. Anthony, nineteen miles above St. Paul's, are the limit to which continuous steam navigation at present extends, the total distance being 1,952 miles.

A hundred miles further up stream the elevation is found to e 1,152 feet, which is not much below that of the little lakes om which the head-waters rise. Lake Superior lies from fty to a hundred miles only to the east of these lakes, and s an elevation of 600 feet, while the land intervening, which forms the divide,* can be crossed at an elevation of 1,158 feet, on the same parallel as the southern shore of Lake Superior. From the head-waters of the Mississippi northward, the land falls gradually towards Lake Winnipeg in British territory. Thus the rise of the continent, north and south, only just exceeds 1,000 feet.

Passing *westward* from the Mississippi, and disregarding mountains altogether for the present, the elevation of the continent gradually increases, until it attains its highest level at South *Park*, about the centre of Colorado. If we compare the rise and fall of the continent on all sides to two saddles, placed pommel to pommel, the pommels will represent South Park, the highest part of the median line of maximum elevation, while the prominence sloping downwards from each pommel, and disappearing at the back of each saddle, will well illustrate the course of the "Summit Plateau." For this "Summit Plateau," if it may be so called, diverges from its greatest elevation in a north-westerly direction, to form the less elevated watershed in Montana, between the heads of the Missouri and Columbia rivers; while to the southward it gradually falls also, and videns out into the Llano Estacado (staked plains) of Northern Texas, and the vast plain—the Madre Plateau—which ccupies Southern New Mexico.

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* The term "divide," used as a substantive, may be objected to, on the ground that it is not English. This I grant; but as it is in common use throughout North America, is often to be heard at the Meetings of the Royal Geographical Society, and is frequently so printed in their Reports, I have preferred to use it generally instead of its synonym "water-parting," because, in such compound expressions as "secondary water-parting" or "continental water-parting, "secondary divide" or "continental divide," sounds shorter and crisper. "Dividing-ridge," of course, is only applicable when a mountain range forms the divide.

It may be well at the outset to give the following definitions:—

A *watershed* is the *slope* between a water-parting, or divide, and a watercourse.

A *divide* is the boundary-line between contiguous basins and watersheds.

Two watersheds united at their watercourses constitute a *valley*.

The whole series of valleys traversed by a river and its tributaries of the first, second, third order, &c., constitutes a *basin*.

(*See* "Physical Geography," from the French of Th. Lavallée. Edited by Captain Lendy, F.G.S.)

A few figures, representing average elevations only, may e desirable. The staked plains of Texas average 3,500 eet; the Madre Plateau about 4,000. Rising from these, nd passing northwards, the "Summit Plateau" attains an verage elevation of 7,000 feet in Northern New Mexico, of om 8,000 to 9,000 feet in Colorado, 7,000 in Wyoming, and om 5,000 to 2,000 in Montana, whence it passes into ritish territory.

The country lying between the highest portions of the Summit Plateau" in Colorado and the Mississippi ascends r more rapidly than the adjoining country south of it, which oes not ultimately attain in New Mexico so great an evation; while to the north of Nebraska, Kansas, and olorado, the country has not only a still lower elevation to ach on the Summit Plateau in Montana, but (consequent pon the north-westerly direction of that central line of aximum elevation) has a far longer distance in which to each it. We therefore actually find what theoretically we ould expect—that the largest river in the continent flows rough this district.

The Missouri at Fort Benton, the head of steamboat avigation, is 2,500 miles by water from its mouth, and 3,737 om tide water, and yet at the 111th meridian (South Park ing on the 106th) it is only 3,000 feet above the sea. e cause is obvious. The streams of the high lands of estern Montana, where the springs do not average more an 6,000 feet, pass northwards around the most lofty part of continent, and do not commence a southward course towards Gulf until 700 miles separate them from their western sources. United then into one vast stream (the Missouri), they meander through the less elevated districts, receiving the Platte tributary at an elevation of 968 feet, and the Kansas River at 710, before joining the Mississippi at an elevation of 460 feet.

The streams which cross the elevated country avoided by the Missouri, namely, as before mentioned, Nebraska, Kansas, and Colorado, give very different results. The most westerly sources of the North Platte rise about 2° east by 4° south of those of the Missouri. But the Sweet-water branch has an elevation of 7,220 feet in the highest plateaux; Medicine Bow Creek, 7,000; Laramie River, 7,175; while the South Platte at Denver, on the plains, is 5,000 feet above the sea; and farther up the stream, in the level portion o
South Park, it attains no less an elevation than 9,000 fee
The Arkansas and Canadian rivers in the same manner pa
at first through very elevated regions, not taking into accou
at all the actual mountains or the mountain streams whic
debouch upon these upland plateaux, for at present I ref
only to the general elevation of the country.

West of the "Summit Plateau," the country falls at firs
but only to a limited extent compared with the eastern slope
for the entire district lying between the "Summit Plateau
and the Sierra Nevada consists of table-lands, varying i
elevation from 4,000 to 8,000 feet above the sea. The elev
tion of nearly all Utah exceeds 5,000 feet, excepting only
part of the Great Salt Lake basin, the surface of which lak
is 4,290 feet. Utah Lake, whose surplus waters fall in
Great Salt Lake, is 4,790 feet high, and Lake Sevier, situat
further south in the same basin, is, if anything, a little low

The greater part of Nevada lies between 4,000 and 6,00
feet above the sea, but to the southward the land

gradually, though unevenly, towards the Rio Colorado, and ndirectly towards the Gulf of California. A remarkable depression occurs about latitude 36°, which is separated both from the Rio Colorado and the Gulf by table-lands varying n height from 1,000 to 5,000 feet above its lowest portion. This depression is known as Death Valley.

Lofty table-lands extend also over all New Mexico and Arizona, but gradually fall away towards the mouth of the Rio Gila and the Gulf of California, in the south-west angle of the tter territory. In Southern New Mexico the entire country ecomes depressed into an extended plain,* about the 32nd arallel, having an average elevation of from 3,500 to 4,000 et. The depression, however, does not extend south more han from fifty to one hundred miles before the general rise ommences, which forms the lofty savannas of Mexico, upon hich the mountain ranges of that country rest.

West of the Sierra Nevada of California, the land slopes apidly towards the west coast. Nature has, however, placed barrier in the way by throwing up a series of ranges along he coast, known as the coast ranges. They run for the most art parallel to each other, but obliquely to the coast, so that ange after range becomes lost in the sea, forming prominent eadlands and rocky islands all along the shore. About the entre of the Californian coast, a great gap occurs in these ranges, which forms the "Golden Gate" of San Francisco The sea enters through the narrow channel, and spreads ou into three large basins, protected on all sides by mountain belonging to the coast ranges, thus forming the best and largest harbour in the world.

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* The first promoters of the grand scheme for uniting the Atlantic and acific by a railway crossing the continent in United States territory seem to ave laid great stress upon the importance of this depression. They affirmed, nd with truth, that if the waters of the Atlantic and Pacific were to rise o the height of 4,000 feet, they would meet about the 32nd parallel, leaving wo huge islands, the one to represent the lofty plateaux and mountains of the Western territories, the other the still more elevated plateaux of Mexico. They hought it probable that this depression would prove to be the only practicable oute for the Pacific Railway, and on that account urged the United States overnment to buy it from Mexico. This was done on the 20th of June, 854; ten million dollars were paid for it, and the official document fixing the ew boundary is called the Gadsden Treaty.

Between the coast ranges and the lofty Sierra Nevada lies a wide plain or valley, averaging some sixty miles across, and extending north and south for nearly the entire length of the State. The waters which flow from the western slope of the Sierras and collect in this inland valley cannot penetrate the coast ranges, and go direct to the sea. So those of Souther California form the San Joaquin River, and those of Norther California, the Sacramento; the former runs to the northward and the latter to the southward, in the trough between th outer and inner mountain chains, and both empty themselv into the Bay of San Francisco. This is the drainage syste of California.

I have briefly indicated the course which the general ri or upheaval of the continent has taken. We will now consid the excrescences and irregularities on its surface.

The entire country between the Alleghanies (Appalachia range) and the "Summit Plateau," which extends from th Gulf of Mexico in the South to the watershed of Hudson Bay in the North, is mainly one vast flat for thousands o square miles in the prairie States east of the Mississippi; mor or less undulating on the western plains, most depressed i the valleys of the Mississippi, Ohio, and Missouri, and onl sufficiently elevated at its northern limit to determine the flo of the waters in the two opposite directions, north and sout Scarcely a trace of volcanic disturbance is to be seen in al this vast region. On the "Summit Plateau," however, moun tains for the first time rise from the plains. All along th s of *general elevation*, independent ranges, varying con- erably in direction, height, and extent, have been piled in great apparent confusion, while here and there some ry lofty peaks mark the probable centre of volcanic action special localities.

The explorations made under the auspices of the American vernment, and embodied in the bulky volumes of the cific Railway Reports, have been followed up by surveys d explorations, undertaken by private companies and others, that the knowledge acquired from these many sources has, think, disclosed a certain regularity of design throughout e entire “Summit Plateau” system, which greatly simplifies topography.

To the question, Where is the central range of the Rocky ountains? I confidently answer, Nowhere! There is no ntinuous central chain whatever. It appears to me, on the ntrary, from my own observations, and from diligently amining the explorations of others, that the so-called Rocky ountain system, from the northern boundary of the United tates to their southern termination, consists usually of two hains of mountain ranges, occupying the eastern and western dges of the “Summit Plateau,” and separating it from the lains on either side.

These eastern and western chains communicate by means f transverse ridges at irregular distances, thus cutting up the ‘Summit Plateau” lying between them into a succession of solated plains or “parks” of great elevation.

The word “park,” in Rocky Mountain phraseology, has a pecific signification, and is used exclusively to designate those ofty, well-watered plains, or prairies, to be found all along the ‘Summit Plateau,” shut in on all sides by mountains.

Secondary ranges radiate from the primary chains, and jut out into the less elevated plains, east and west, along th whole extent; while the surface of the central or park distric is not unfrequently much disturbed by lesser ranges piled u in endless confusion.

The “continental divide,” by which I always mean th water-parting of the Atlantic and the Pacific rivers, sometimes passes through the western chain and sometimes through the eastern, crossing and recrossing the “Summit Plateau” by means of the transverse ridges. Had the “Summit Plateau” been capped by one vast central pile, this would not have been the case.

Again, the points which show signs, by their lofty peaks of the most intense volcanic action, and, by the range radiating from them, that they were the centres of mountain making forces, are always to be found along the western o eastern main chains, at the edges, and not in the centre o the “Summit Plateau,” which represents the back-bone o the general upheaval of the continent.

Such volcanic peaks are:—

Fremont's Peak	13,570 feet.
Laramie Peak	not known.
Long's Peak	13,575 feet.
Mount Lincoln*	17,000 feet.
Mount Gray	14,400 feet.
Pike's Peak	not known.
Spanish Peak	11,000 feet.

None of which have a central position on the “Summi Plateau.”

The general direction of the “Dual Main Chains” is th same as that of the “Summit Plateau,” upon which the rest. From the 49th to the 42nd parallels it is north-wes and south-east; from the 42nd to the 38th, nearly north an south. From about this parallel the main chains part com

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* On a transverse ridge, although nearly central.

y. The course of the eastern ranges is mostly north and h, until they become lost in the detached mountains ween the Rio Grande and the Pecos River; the western ges run more west of south, until they sink below the ace in the great Madre Plateau of New Mexico.

ll the innumerable ranges of hills and mountains which r the regions west of the main chains, and east of the ra Nevada, and which do not obviously jut out from the ner, ought not to be placed under the head of the Rocky ntain system. Such a classification only causes confusion, is not warranted either from the physical relations or logical formation of the mountains themselves.

o establish the truth of the above assertions with respect he Rocky Mountains and their general topography, I must er to the map, while I very briefly point out the facts ich have led me to such conclusions.

Commencing at the north, near the British American ntier, the two main chains are represented by the Bitter oot Mountains on the west, and by the "Flat Head Moun-ins"* on the east. A transverse range, The Big Hole ountains, unites these ranges a little south of the 48th rallel.

The Park region, thus enclosed, is fully one hundred miles cross, by thrice that distance in length. It is traversed in all irections by lesser ranges covered with pine, and enclosing arks and prairies, forests and lakes.

The general slope of this country is towards the north-est, and the only outlet through which the drainage of the ntire district can escape is in that direction. The stream here formed is known as Clark's Fork, and is the main branch of the Columbia River. This region is at present special interest, as being that through which the Northe Pacific Railway Company proposes to cross the "Summ Plateau." They intend entering it through Cadott's Pass, i the Flat Head range, crossing at this point the continent divide (which is found here in the eastern main chain), at a elevation of 5,330 feet. The railroad must then follow th general direction of the drainage towards the north-west, s as to pass around the northern extremity of the Bitter Ro Mountains, which it heads near Pend d'Oreille Lake, onl 2,020 feet above the sea, and 240 miles from Cadott's Pas As this pass (Cadott's) is only one out of several at the bac of Helena, and as it entails a long tunnel, a better route wi in all probability be found when the district is thorough surveyed. All this region abounds in mineral wealth, esp cially in gold leads, which have of late years been so produ tive as to make Helena, the centre of the largest minin district, a place of considerable importance.

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* Name not permanently fixed, sometimes called Deer Park Mountains. I refer the name derived from the Indians who inhabit these regions.

The continental divide, having crossed the "Summit Pl teau" through the Big Hole Mountains, traverses the weste chain in a south-easterly direction for about a hundred mile where it crosses the "Summit Plateau," for a second time, a right angles, passes into the Wind River Mountains, and the resumes its former general direction southward. The easte chain is here represented by hills forming the local divi between the Maddison and Jefferson rivers, which are th terminal forks of the Missouri. The central, or Park distric much resembles that separated from it by the Big Ho transverse range. It is hilly, heavily timbered in places, an contains several fertile parks, such as Big Hole Prairie, Hor Prairie, and Hooked Man's Park.

The duality of the chief ranges is not clearly defined fo e next hundred miles; nor is this surprising, considering that this section one of the main divides of the western country viz., that between the waters of the Gulf of California and ose of the Northern Pacific—joins the mountains on the Summit Plateau.” A little north of Fremont's Peak, the st lofty summit of the Wind River range (elevation 13,570 t), the Bear Mountains jut out towards the Great Wahsatch ge, as a spur from the Rocky Mountain system. Along s range the divide passes—the waters destined for the Gulf California, which flow south, being represented by the ds of Green River, the northern branch of the Rio lorado; and those of the Northern Pacific by the terminal nches of Lewis Fork or Snake River, which latter flows to the Columbia.

To the north-east of the Wind River Mountains, and rising rom the plains, are the Big Horn, the Snow, the Girdle, and ther "lost mountains," our present ignorance of which, both opographical and geological, will not allow us to group into ny general system.

South-east of the Wind River Mountains, and forming its outhern continuation, runs a range of hills upon the western dge of the lofty "Summit Plateau," representing the western main chain. Along this range passes the continental divide, having South Pass, Bridger's, and others in its course. The eastern main chain is here called the Black Hills; that part of the "Summit Plateau" which intervenes is the level park district, known as the Laramie Plains.

The great elevation of these plains, which exceeds 7,000 feet, coupled with their high latitude, renders them useless for agriculture, although for the most part they are good grazing lands. The mountains, however, present so small an obstacle to engineering works (having in reality sunk into hills), that the Union Pacific Railway Company has chosen this district as affording the best passage across the continent for the central route. They have cut through the Black Hills by means of a short tunnel at Cheyenne Pass (elevation 8,242 feet), with an average grade of 74 feet per mile, have laid the iron ways across the level "Summit Plateau" (Laramie Plains), and have crossed the continental divide by a still less difficult pass than that through the Black Hills (situated about midway between South Pass and Bridger's), at an elevation of 7,534 feet.

These elevations are enormous, surpassing even the famous Summit Railway which crosses Mont Cenis at an elevation of 6,800 feet. There are few engineering difficulties, however, to contend against, and the construction of the railwa is comparatively inexpensive.

The continental divide continues its south-easterly dire tion for about fifty miles from Bridger's Pass in the wester main chain, then passes due south for another fifty mile and then crosses the "Summit Plateau" from the western the eastern main chain. The portion of the plateau north this transverse range (for such is the divide here) is know as North Park; it is cut off from the Laramie Plains by minor range, and is shut in along its eastern boundary by th eastern main chain, a spur of which juts up into the Larami Plains, as the Medicine Bow Mountains.

The only outlet for the drainage of North Park is throug a cleft in its northern boundary. Through this the water run, forming the north fork of the Platte River. Th stream traverses the Laramie Plains, passes out at their northwestern corner, winds eastward around the Black Hills, and finally crosses the plains of Nebraska towards the Missou River.

Having crossed by the southern mountain boundary of rth Park into the eastern main chain, the continental ide lies now on the eastern side of the "Summit Plateau," t only through 1°; it then crosses again from Long's ak to the western chain, forming three sides of a uare, enclosing the next park, Middle Park, which, of urse, is drained by streams flowing west. These streams the head-waters of Grand River; they escape through a ft in the western main chain, and, uniting eventually with een River, form the Great Colorado of the West.

The next section of the "Summit Plateau" is South Park; s hemmed in on all sides, like the other parks, by mountains, the eastern and western main chains being well defined. e continental divide traverses the northern and western nges which bound the park. The drainage is collected to two streams, and passes through the other two sides at through the eastern forms the south fork of the Platte, hile that which escapes through the southern becomes the rkansas River.

South of South Park the two main chains of the Rocky ountain system are never again united by transverse ranges, ut diverge very considerably, as may be seen by referring o the map. In the fork thus formed rise the head-waters of he Rio Grande, and as the ranges diverge, so does the valley f this important river widen out. High up in the fork the "Summit Plateau" is called the St. Louis Park, and with ts crystal streams, its corn-fields, and its lake abounding in rout, is well deemed the most beautiful of all the Parks. It s no less than 7,500 feet above the sea; the mountains bounding it on the east are called the Sierra Blanca, and hose on the west the Sierra de San Juan.

Gradually the "Summit Plateau" widens out, and sinks to the southward, until it can no longer be recognised as a distinct table-land. The following elevations along the Rio Grande valley, from the St. Louis Park to the Mexican frontier, demonstrate the downward slope most clearly:—

	Intermediate distances in miles.	Elevations.
St. Louis Park		7,567
Santa Fé	150·0	6,846
Albuquerque	62·96	5,033
Isletta	14·0	5,022
Fort Craig	111	4,508
El Paso	147	3,830

South of El Paso, the Rio Grande encounters the eastern extremity of the central plateau of Mexico, and, like a true Western river, cuts its way through it, forming for nearly 180 miles a succession of magnificent cañons.

The eastern chain of the Rocky Mountain system term nates a few miles south-east of Santa Fé, scarcely reachi the 35th parallel; for the long narrow ranges of gold a silver-bearing mountains, the Placer, Zandia, Manzana, So dad, Organ, &c., which form almost an unbroken chain alo the eastern side of the Rio Grande valley, should not l classed in the Rocky Mountain system; they are differen in formation, and more recent in date.

The western chain continues from South Park, to represe the continental divide. In it different ranges have receive special local names, but all are spoken of in general terms a the "Sierra Madre of New Mexico." How many, or how few of these ranges, from the Sierra de San Juan north of the 47t parallel to the Miembres and Burro Mountains, which form the northern boundary of the great Madre Plateau south o the 33rd, ought to be considered as southern continuations o the Rocky Mountain system, must remain undecided unti the country north of Mount Taylor is better known.

expect that a well-marked geological separation will then be found to exist between the more recent volcanic formations of which that mountain and its southern continuations are composed, and the far older structures and primitive upheavals characteristic of the true Rocky Mountain system.

III.

GENERAL FEATURES OF THE COLORADO BASIN.

The Three Great River Basins west of the Rocky Mountains compared.—The Wahsatch Mountains.—Lieutenant Ives' Expedition.—The Colorado Basi consists of a succession of lofty, arid Table-lands.—Dr. Newberry on th Origin of the Strata forming these Table-lands.—The Drainage passe usually through Cañons.—The Colorado Plateau, and the Great Cañon which passes through it.—How are Cañons formed?—To what causes are due the Table-land features of the Country?—Central Arizona.—The Mogollor San Francisco, Pina-leño, Sierra Madre, and other Mountains in tl Colorado Basin.—Valleys of the Rio Colorado.—Valley of the Rio Gila.

THE country lying between the Rocky Mountains and th Sierra Nevada consists of three regions. The basin of th Columbia River forms the northern, that of the Colorado th eastern and southern, and that of the Great Basin syste the western. There is not very much difference between th areas of these districts.

	Square miles.
The basin of the Columbia River has an area of about .	230,000
That of the Colorado	200,000
That of the Great Basin	280,000
For the sake of comparison, the area of France is . .	210,000
That of the Mississippi Basin	1,400,000
That of the Rio Grande del Norte Basin	210,000

As we do not enter the basin of the Columbia River in any part of our travels, I shall confine my observations exclusively to the other two sections of country; only remarking here, that the divide which separates the *Columbian Basin* from the *Great Basin* system passes from the southern extremity of the Blue Mountains of Oregon in a south-westerly direction, into the *Sierra Nevada* system, about latitude 42°, and in a south-easterly direction almost to the great bend of Humboldt River; thence it passes a little northward again, as the ranges north of the Great Basin indicate, between that river and the Snake, until it enters the northern extremity of the Wahsatch Mountains.

From the northern extremity of these Wahsatch Mountains a short range, named the Bear Mountains, passes, as I have before said, into the Rocky Mountain chain. This range separates the Columbia from the Colorado Basin, and is the ridge by which this divide unites with the main divide of the continent.

Between the main chains of the Rocky Mountains and the Sierra Nevada, the Wahsatch range is the largest and most important. It extends from latitude 41°, north of Great Salt Lake, almost to lat. 34°. For the first half of this distance its general direction is nearly south; for the latter, southwest; so that it passes from the 111th to the 115th meridian. Throughout its entire length it forms the divide between the waters of the Colorado at the Great Basin.

About the head-waters of Bear River, one of the three tributaries of Great Salt Lake, this divide appears to require some slight explanation. Although Great Salt Lake is 4,290 feet above the sea, and the Wahsatch Mountains rise in magnificent proportions to the east and north-east of it, yet this most western part of the range does not represent the rim of the basin—the dividing ridge between the waters of Salt Lake and the Rio Colorado—for the country behind is still higher; and the mountains themselves in this locality are some seventy miles across. The consequence is, that the rim of the basin is found to lie some sixty miles east of the western slopes of the mountains.

The drainage of this mountain belt of sixty miles collects in a central trough as Bear River. The river flows northward in this trough in the mountains for about 300 miles, then bends westward around the western barriers, and flows southward into Great Salt Lake.

The Central Railway route (Union Pacific Railway) crosses the Wahsatch Mountains, and passes around the northern end of the Great Lake; it then follows the valley of the Humboldt for 300 miles towards California. In approaching Salt Lake, it is evident that the railway has to cross two dividing ridges at least: 1st, the *true* rim of the basin, and 2nd, the *false* rim, or the ridge lying between Bear River and the lake. This ridge really consists of the lofty western range of the Wahsatch, and would have proved almost an insurmountable barrier, had not another tributary of the lake cut its way through it, forming Echo and Weber Cañons.

The Colorado Basin is separated from that of the Rio Grande and the Mississippi, on the east, by the continental divide of the Rocky Mountains, and from the drainage of the Laguna de Guzman by an almost imperceptible divide, which crosses the level Madre Plateau from the south-eastern extremity of the Burro Mountains into the mountains of Mexico. Thence the divide runs in a westerly course, sometimes in Mexican, and sometimes in American territory, along the boundary line, separating the Gila branches of the Colorado from the streams of Northern Sonora. We see, then, that the Colorado Basin forms a large triangle, limited, on the east, by the continental divide of the Rocky Mountains; on the south, by the high lands about the Mexican boundary line; and on the north-west by the Wahsatch Mountains.

In the northern angle, almost reaching the 44th parallel, se the waters of Green River. From the western slopes of e "Summit Plateau" of the Rocky Mountains, further to e southward, collect the heads of Grand River. These nite about twenty miles below the crossings of the old panish trail from Los Angelos to Abiquiu, about lat. 37° 0″, long. 111°, and form the Rio Colorado of the West. fine stream, the Rio San Juan, enters from the east, and bout lat. 26° 15″, and long. 113° (Ives' Rep.), the next reat tributary pours its waters into the Rio Colorado; this the Flax River, or Colorado Chiquito (Little Colorado); nd, lastly, the Rio Gila, which drains all the southern half f Arizona, enters the main stream at Fort Yuma, sixty iles above its mouth.

In the course of the following pages the reader will, in agination, cross the Colorado Basin at three different ints :—

On the 32nd parallel, in the Basin of Rio Gila.
On the 35th ,, ,, Colorado Chiquito.
On the 41st ,, ,, Green River.

In my brief description of the general features of this onderful country, I shall constantly quote the authority Dr. J. S. Newberry, who examined, with the greatest bility, that section which is most interesting to us, from its roximity to the proposed line of railway, to the surveying arties for which we were attached.

In 1857-8 Lieutenant Joseph C. Ives, under the authoity of the United States Government, made an exploraion of the Rio Colorado from the Gulf of California to the ead of navigation, 530 miles by water, from the mouth. His party then left the stream, and crossed the continent by and, traversing the country between the 35th parallel and he Colorado Chiquito, and striking the Big Cañon of the

Colorado at two points on the route. Dr. Newberry was the geologist of this expedition, an account of which was published by authority of Congress in 1861. This volume gives the most perfect account of an exploration scientifically conducted that I have ever met with; but, like many other valuable documents published by authority of the United States Senate, it is not for sale, but, having been distributed promiscuously when published to members of the Legislature, whether interested in the subject or not, it can now only be obtained here and there, at second-hand book-stalls, or at library auctions in the States.

The geologists of our parties, Dr. Le Conte and Dr. Parry, fully endorse the conclusions given to the public by Dr. Newberry in his Report, while many of the predictions of that distinguished geologist have since been verified.

The entire Colorado Basin consists of a series of table-lands, piled up one above the other, and covering the whole country. In elevation they vary from 4,000 to 7,000 feet, and reach, in some places, a height of 8,000 feet above the sea. They succeed each other in a series of steps, which generally present abrupt and wall-like edges, the more recent stratum occupying the highest portion of the plateau.

Complete barrenness is the rule, fertility the rare exception; scarcely any vegetation, save the Artemisian scrub, is to be found between the 36th and 42nd parallels; the earth, for the most part, is bare and naked, showing the wear and tear of ages, the erosion of the primeval ocean, and the cracks and fissures of the more recent water-courses.

Whence, we may ask, did the material come from, of which these table-lands are composed?

To what cause is due the Mesa, or Table-land feature of this country?

How are Cañons formed, and what physical conditions are cessary to their formation ?

In answer to the first of these questions, Dr. Newberry rites as follows :—

“The question of the origin of the sediments composing e stratified rocks of the table-lands of the Colorado can arcely be intelligently discussed till we know more than we w do of the geology of a large area lying north of the lorado, and of the broad and compound belt of mountains, ich we have covered by a single name (Rocky Mountains), t which, when carefully studied, will probably not be found form a geological unity.

“This much, however, we can fairly infer from the observa- ns already made on the geological structure of the Far est, viz., that the outlines of the North American continent re approximately marked out from the earliest Palæozoic es, not simply by areas of shallower water in an almost ndless ocean, but by groups of islands, and broad con- ental surfaces of dry land. Since the erosion of rocks is ays sub-aërial, or at least never takes place more than feet below the ocean surface, it follows, that to form the atified rocks of only that portion of the great central teau which borders the Colorado, an island 300 miles in ameter, and at least 6,000 feet high—or, what is more obable, a continent of six times that area, and 1,000 feet gh—was worn down by the action of waves and rains, and, the form of sediments, sand, gravel, clay, or lime, deposited the sea bottom.

“When we reflect that, with the exception of narrow edges of eruptive material in the mountains, an area, having the 36th parallel, the breadth of the entire distance between e great bend of the Colorado and the Mississippi (1,200 miles), and a great, though yet unmeasured, extension north and south, is occupied by several thousand feet of Palæozoic and secondary strata, we must conclude that these sediments have not been derived from the erosion of immerged surfaces east of the Mississippi, but were *here* formed by the incessant action of the Pacific waves on shores that, perhaps for hundreds of miles, succumbed to their power, and by broad and rapid rivers, which flowed from the mountains, and through the fertile valleys of a primeval Atlantis."

These many thousand feet of sedimentary strata were converted into dry land by the gradual upheaval of the Plutonic rocks upon which they were deposited. Generally, they were raised with but little disturbance of their original positions; still, districts, or rather lines, of more powerful upheavals can be traced across the country by the increased height of the table-lands, while here and there more recent volcanic forces have thrust huge masses of igneous rock up through the sedimentary crust, forming mountains more or less isolated, and of great beauty, which contrast strangely with the eroded mesa-lands amongst which they rise. Such are the San Francisco Mountains, Mount Taylor, and Bill Williams Mountains—all now extinct volcanoes.

The thousand springs of Green and Grand rivers which start from an elevation of from 10,000 to 12,000 feet, form cañons in the mountain districts only when some unusual obstacle bars their course. In the mountains which give them birth, frequent rains have washed out sloping valleys, and the primitive rocks have generally succeeded in resisting, to a great extent, their erosive action.

Further from their sources, beyond the influence of the mountain rains, these two rivers and their tributaries, in their passage over the table-lands of the great central plateau, have causes which shall be explained afterwards, cut their way rough them in channels, which deepen continually as they vance, and also present fewer and fewer open valleys as ey progress, to break the narrow and sunless perpendicurity of their gigantic walls, until, in the case of the Colorado, is penetrative tendency culminates in a gorge or cañon, om 3,000 to 6,000 feet in depth, which, for at least 500 iles, is totally inaccessible from above.

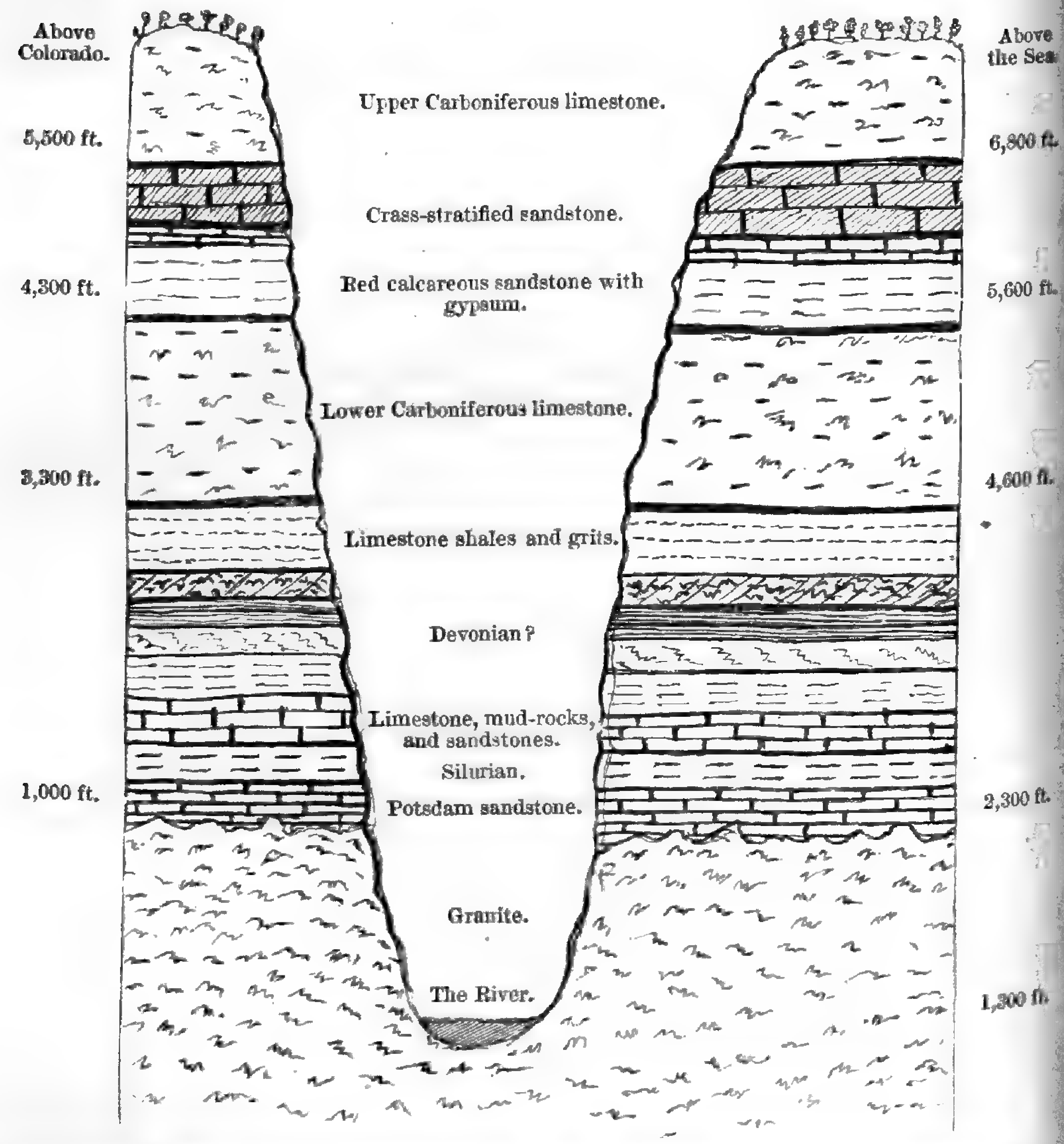
The plateau of the Colorado—that is, the district through hich this river runs for 5° of latitude—has been raised to average elevation of 7,000 feet. It extends in a N.N.W. rection, from a point south-east of the San Francisco ountains, across the Colorado into Utah, and includes a rtion of the country traversed by Grand and Green rivers, fore they unite to form the Rio Colorado, as well as a more nsiderable part of that crossed by the Colorado Chiquito d the Rio San Juan in the latter part of their course.

"Over this plateau," says Dr. Newberry, "the Rio Colodo formerly flowed for at least 500 miles of its course; but the lapse of ages its rapid current has cut its bed down rough all the sedimentary strata, and several hundred feet to the granite base on which they rest.

"For 300 miles the cut edges of the table-lands rise ruptly, often perpendicularly, from the water's edge, rming walls from 3,000 feet to over a mile in height. This the Great Cañon of the Colorado—the most magnificent orge, as well as the grandest geological section, of which we ave any knowledge."

"That portion of the table-lands lying between the mouth f the Virgen and the Little Colorado is composed of over ,000 feet of sedimentary rocks, representing the Silurian, evonian, and Carboniferous epochs."

Since Lieutenant Ives' expedition in 1857-8, no attemp has been made to throw any further light upon the structur or geography of this wondrous gorge. It chanced, however, that whilst our parties were conducting their surveys along


Above Colorado.
5,500 ft.
4,300 ft.
3,300 ft.
1,000 ft.
Above the Sea
6,800 ft.
5,600 ft.
4,600 ft.
2,300 ft.
1,300 ft.
Upper Carboniferous limestone.
Crass-stratified sandstone.
Red calcareous sandstone with gypsum.
Lower Carboniferous limestone.
Limestone shales and grits.
Devonian?
Limestone, mud-rocks, and sandstones.
Silurian.
Potsdam sandstone.
Granite.
The River.

Section of the Cañon of the Colorado on the High Mesa west of the Little Colorado (by J. S. Newberry, M.D.).

the Colorado Chiquito, an unfortunate prospector, named James White, was actually passing through the entire length of this chasm upon a simple raft of cotton-wood. As a full account of this hazardous and thrilling adventure will be and elsewhere, I need not here make any further allusion it.

Between the Colorado Plateau—through which the Little lorado also cuts its way to join the main stream, like rand and Green rivers, in a lofty-sided cañon of its own—d the Moquis country (another very elevated table-land), elongated basin extends from the Mogollon Mountains rth-westward into Utah. As variegated marls here come the surface, much of this wide trough has received the me of the "Painted Desert." Through a great part of is depression the Colorado Chiquito flows, with open nks, through fertile bottom-land of considerable extent, til it enters the Colorado Plateau.

To the north-west the country again rises step by step, mesa on mesa; and upon the edges of several of these latter may found those interesting fortified towns—the pueblos of the quis Indians.

When Lieutenant Ives' party visited these regions, they d to explore the country to the north-east, but want of ter and extreme barrenness compelled them to return, and tinue their journey eastward by Fort Defiance into the Grande valley, and thence across the plains. Dr. New- ry thus speaks of the Moquis country and the districts yond:—

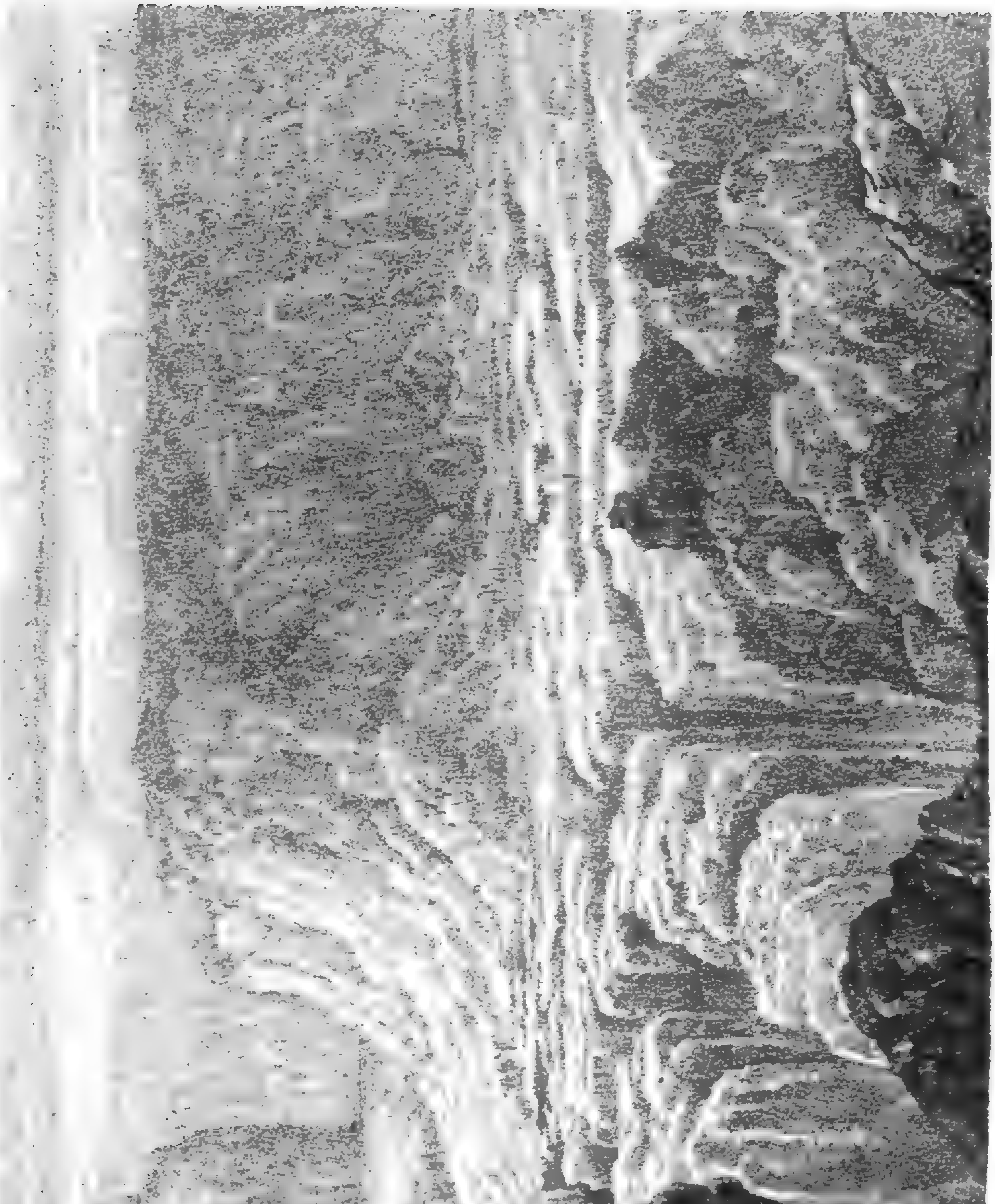
"This mesa is, geologically and physically, the highest ich we actually passed over on our route west of the cky Mountains. Near Fort Defiance its summit has an itude of nearly 8,000 feet. At the Moquis villages, the ata forming the table-lands begin to rise towards the st; and near Fort Defiance, where the mesa country reaches 000 feet, they plainly show the disturbing influence of the ost westerly axis of elevation of the Rocky Mountain system.

Further east, to the Rio Grande and beyond it, they are much dislocated, and finally lose their distinctive character in the intricacies of the mountain ranges.

"In the interval between Fort Defiance and the Rio Grande rises a great volcanic mountain, Mount Taylor (San Mateo), which, like that of San Francisco, has burst through the sedimentary strata, and poured over them floods of lava, which are as fresh as though ejected but yesterday.

"The highest of the table-lands which we passed over was formed of Lower Cretaceous strata; and yet another must be added to the series before my description of them will be complete.

"On our route across the continent, we passed somewhat south of the centre of what we may, perhaps, properly call the basin of the Upper Colorado, and did not, therefore, mount quite to the summit of its geological series. Going north from the Moquis villages on the Lower Cretaceous mesa, our progress was arrested by a want of water, the surface being everywhere cut by deep cañons, by which it is drained to excess, every rain-drop which falls finding its way immediately into the bottom of these ravines, where it is hurried off to the far deeper cañons of the Colorado and its larger tributaries. Before we turned back, however, we had approached nearly to the base of a wall, rising abruptly from the mesa in which we stood to the height of more than 1,000 feet. This wall was as white as chalk, and reflected the sunlight like a bank of snow. It is evidently the edge of another and a higher plateau, and apparently reaches to the Rio Colorado, where it caps the high mesa, forming part of the stupendous mural faces presented towards the south and west, which were distinctly visible when we had receded from them to the distance of one hundred miles.



“ What the character of this upper mesa is I had no means determining at that time, and even now there may be some uestion about it; but I have scarcely a doubt that it is omposed of the Upper Cretaceous strata, the equivalents of he true chalk of Europe.” This has not yet been recognised y any geologist on the American Continent.*

From what has been said, we can now answer the question —How are cañons formed, and what are the physical conditions necessary for their formation?

Cañons are usually formed by the action of water only, naided by volcanic force, which is often erroneously said to e the primary cause of the so-called fissures and cracks through which the waters flow.

The physical conditions are,—1st. A dry climate, in which even periodical rains do not fall to any considerable amount; 2nd. The passage of never-failing streams from their distant and exterior sources through this dry country; 3rd. It is requisite that the surface strata should be of such a nature as easily to yield to the action of the current; but when once a groove has been furrowed, and the water channel definitely fixed, it does not appear to matter of what the underlying rocks are composed, since the unceasing attrition of ages has, in some instances, succeeded in cutting through 1,000 feet of the hardest granite; 4th. It is requisite that the fall of the land should be sufficiently great to insure a rapid current.

It is impossible for a country in which cañons abound to be anything but sterile and utterly worthless, for the deep cuttings everywhere drain it to the utmost; and the waters, buried deep in the bowels of the earth, lie far beyond the reach of animal or vegetable life on the surface.

In answer to the question, To what causes are due the mesa, or table-land, features of this country? I quote Dr. Newberry in his own words:—

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* Vessels are ballasted with true chalk from London to New York.

"Like the great cañons of the Colorado, the broad valleys, bounded by high and perpendicular walls, belong to a vast system of erosion, and are wholly due to the action of water. Probably nowhere in the world has the action of this agent produced results so surprising, both as regards their magnitude and their peculiar character. It is not at all strange that a cause which has given, to what was once an immense plain, underlaid by thousands of feet of sedimentary rocks, conformable throughout, a topographical character more complicated than that of any mountain chain; which has made much of it absolutely impassable to man, or any animal but the winged orders of creation, should be regarded as something out of the common course of nature. Hence the first and most plausible explanation of the striking surface features of this region is to refer them to that embodiment of resistless power—the sword which cuts so many geological knots—volcanic force.

"The great cañon of the Colorado would be considered a vast fissure or rent in the earth's crust, and the abrupt termination of the steppes of the table-lands as marking lines of displacement. This theory, though so plausible, and so entirely adequate to explain all the striking phenomena, lacks a single requisite to acceptance, and that is *truth*.

"Aside from the slight local disturbance of the sedimentary rocks, about the San Francisco mountain—from the spurs of the Rocky Mountains, near Fort Defiance on the east, to those of the Cerbas and Aztec mountains on the west—the strata of the table-lands are as entirely unbroken as when deposited. Having this fact constantly in mind, and examining with all possible care the structure of the great cañons which we entered, I everywhere found evidence of the exclusive action f water in their formation. The opposite sides of the eepest chasm showed perfect correspondence of stratification, onforming to the general dip, and nowhere was there displacenent; the bottom rock, so often dry and bare, was, perhaps, leeply eroded, but continuous from side to side, a portion of he yet undivided series lying below. The mesa walls should e included in the same category with those of the cañons—ometimes, indeed, they are but cañons, miles in breadth.

"The origin of the series of escarpments which are met vith in crossing the table-lands from west to east is, I think, lependent upon very general, but yet appreciable causes, to vhich I can here, however, but briefly allude.

"From the Cerbas Mountains to the base of the high nesa,* the strata composing the high table-lands have a iorth-easterly dip of about 100 feet to the mile. There they ise, but soon dip again into the valley of the Little Colorado, heir strike being nearly at right angles with the course of he great draining stream, the Colorado. By a glance at the nap, it will be seen that the watershed, made up by the San rancisco group, the Mogollon, and the spurs of the Rocky ountains, which throws the water into the Colorado over the able-lands from the south, south-east, and east, forms a semi-ircle imperfectly parallel with the course of the Colorado, nto which the drainage from the different parts of this semi-ircle falls nearly at right angles. The flow of waters from he mountains has therefore been here, as elsewhere along the trike of the strata, north and north-west from the San rancisco and Mogollon mountains on the western side of the asin. The legitimate and inevitable effect of this combinaion of causes has been to erode the *softer* down to the *harder* trata, forming broad valleys, bounded on the west by the denuded slope of the harder rocks; on the east by the abrupt wall of the softer strata, most precipitous when capped by harder material. The erosion, for the most part produced by water flowing from a distant source, has taken place on the harder material at the bottom only of each trough, and thus has preserved the abruptness of the wall." *

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* That mesa, N.E. of Fort Defiance, supposed to consist of true chalk.

Leaving the weird, worthless regions north of the 36th parallel, let us glance for a moment at those forming Central Arizona, lying between the Colorado Chiquito and the Rio Gila. Nearly all this region has been greatly disturbed by innumerable ranges of mountains, more or less volcanic, while the surface is covered with the products of volcanoes now extinct, and with the drift washed from the mountain sides.

Between the head-waters of the Rio Gila and the Colorado Chiquito is a very elevated tract of country, chiefly occupied by the various ranges known as the Mogollon Mountains, which shed their waters in a southern direction to form the Rio Gila, and in a north and north-western direction towards the Colorado Chiquito. The hostile Indians, the Apaches, of these regions have, up to the present time, so kept the white man at bay that no explorations have been made through them; and we know nothing of the country, except from the few daring prospectors whom thirst for gold has led to risk their lives in its pursuit. The reports of these men, who are wonderfully shrewd and reliable, describe the land as being very beautiful and of great fertility. Forests of noble pine cover large portions of the mountains, enclosing well-watered parks and valleys of considerable extent, clothed with luxu-

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* I have quoted Dr. Newberry at some length, because I feel that great credit is due to him for so clearly laying down those principles which, when thoroughly grasped by the Western traveller, enable him to read the face of nature intelligently, and to account for much of what is very striking, in a manner satisfactory to himself, even though he may not be versed in geology.

nt Grama grass; and although much of it is wild and rren, cut up by ravines and impassable barriers, still the gns of mineral wealth everywhere abound, and predict a osperous future for this section of country.

The moisture from the Gulf of Mexico has no great obstacle bar its way between the Texan coast and these regions, and cause its precipitation before arriving at them; for the Summit Plateau" in this latitude has sloped away, and the ocky Mountain chains have ceased to be conspicuous, so hat the rainfall about the mountains of Central Arizona is far reater than the travellers who have passed north, or, as is nore usually the case, south of them, in the more level though nore arid districts, are aware of.

The next belt of mountain ranges, also trending north-west and south-east, is that which has the Aztec Mountains, Bill Williams Mountain, and perhaps the San Francisco peaks, to mark its northern extremity. It passes obliquely across Arizona, cresting the San Francisco Plateau, forming the Pina-leño Mountains, north and south of the Rio Gila; the Chiricahui Mountains, their continuation; the Sierra Calitro and Sierra de Santa Catarina, parallel ranges; then, crossing the boundary line into Mexico, the mountain sources of the San Pedro and Santa Cruz rivers form part of the same belt of upheaval. At last it is merged into the Sierra Madre, which caps the plateau of Mexico. If the Sierra Madre, or main mountain chain of Mexico proper, be a continuation of any northerly chain, it is of that which I have just mentioned, and not, as is commonly but erroneously supposed, of the Rocky Mountains, which undoubtedly lose themselves at least 2° to the north-east in the broad plateau of New Mexico, commonly known as the Plateau of the Sierra Madre.

When a range of mountains forms the main continental water-parting, the Mexicans of the locality very commonly call it the "Sierra Madre," or Mother Mountain; thus it happens that there are several Sierra Madres, which belong not only to the actual Rocky Mountain system, north of the 34th parallel, but also rise from the highest plateaux of Mexico proper. And while referring to this distinction, I may add that I have thought it desirable to carry the same idea further, and leave out the word *Sierra* in the name given to the great plateau of Southern New Mexico, thus calling it simply the Madre (or Mother) Plateau, because the continental divide actually crosses it, although no range of mountains, or in fact any perceptible inequality of surface, marks the water-parting.

North of the Rio Gila, the description of the Mogollon mountain belt applies with equal truth to these ranges, except that portions of country amongst the latter have been settled up, partly by Mexicans, the remnant of the Spanish occupation of the sixteenth and seventeenth centuries, and partly by Americans, since the annexation in 1848. Extensive mining districts have been discovered; mines have been opened and found to yield abundantly; herdsmen have commenced raising stock; and farmers have found that crops could be grown, even without irrigation, in many places around Prescott (the capital), situated in the northern part of this belt of mountains. But the wild Indians of these regions are waging, as they have been waging for ages, unceasing war against the cultivator of the soil, whether he be Aztec, Mexican, or Anglo-Saxon; and, although vastly inferior beings in every respect, these savages are even now successfully stamping out the efforts of the white men to inhabit the country. The Apaches, who have ever lived by the plunder of their neighbours, are at this moment driving back the tide of emigraon in Central and Southern Arizona; and neither the ttlers nor the military dispersed throughout the country re able to contend successfully against them. Is the country lways to remain a wilderness?

Wherever we or our parties have been we have found the hole country strewn with the ruins of villages, irrigating anals, and pottery belonging to a populous race now extinct. The Indians of the Moquis villages, which have been eferred to; the Indians of the Pima villages, who cultivate rge tracts of land in the Rio Gila bottoms; and the wanderng tribe, the Papagos, who inhabit a large tract of country, lmost a desert, south of that river, are the only civilised ndians now to be found in Arizona. The fertile valleys of hese regions once supported a very considerable population. ave the Apaches overpowered them, or have recent physical hanges in the country led to their disappearance? There is uch to be said in favour of either hypothesis; but we will ave the discussion of them until we have travelled through e country and made the acquaintance of its present inhaitants.

Between the comparatively fertile belt of mountainous ountry which we have been considering, and the Rio olorado, lies a district less elevated, and becoming very ry and arid as we pass westward. It is, however, covered ore or less with short ranges of bare, volcanic hills, rich in inerals, gold and silver veins, which are attracting the ttention of miners from California more and more every ear. At last the Colorado Desert is itself reached. This iver, having traversed the lofty plateau in almost a due esterly course, takes a great bend to the south, and emergng from its cañoned table-lands into the lower country, eanders through broad and sultry valleys, which become more and more parched and sterile as they near the head of the Gulf of California.

The Rio Gila does much the same thing: it cuts through the Pina-leño Mountains north of Camp Grant by means of a succession of cañons. Its bottom-lands are extensive and fertile *above* these cañons for a distance which at present is not ascertained, and *below* them for about fifty miles in the Pima country. But, further west, it enters the sterile region known as the Gila Desert, the continuation northward of the Great Sonora Desert, and passes through it for the remaining 150 miles of its course until it reaches the Colorado.

This completes our rapid survey of the Colorado Basin. We will now pass over the Wahsatch Mountains, forming its western boundary, and take a bird's-eye view of the country beyond.

IV.

GENERAL FEATURES OF THE GREAT BASIN.

Shape, Boundaries, and Elevations of the so-called "Great Basin."—The Region is covered throughout with short Volcanic Mountain Ranges.—The Soil.—The Drainage: its Peculiarities.—The term "Great Basin" is a misnomer.—Lakes and Rivers.—Oases in the Desert.—Mormon Settlements.—Mineral Wealth.—The Comstock Lode.

Between the Wahsatch Mountains and the Sierra Nevada, extending northward beyond the 42nd parallel, and southward into Lower California, lies a district considerably larger than the kingdom of France, which goes by the name of the *Great Basin.* It has received the name simply from the fact that none of its rivers enter the sea. It is not an appropriate name, however, for it embodies a glaring topographical error.

The Colorado Basin represents in shape a triangle, whose apex lies to the north or north-east; the Great Basin (we must retain the usual name) is also shaped like a triangle, whose apex points to the south or south-west. From this apex at the Gulf of California, the ground rises from the level of tide-water to 5,000 feet, or thereabouts, in Central Nevada; and this is about the general level of the whole country between the Sierra Nevada and the Wahsatch Mountains in the broad part of the Great Basin. North of the Humboldt, where the drainage divides, this elevation is exceeded, and there are innumerable local depressions which scarcely reach 4,000 feet; but north of the 37th parallel there are few places below this elevation.

There is great uniformity throughout the whole of the country; the surface is covered everywhere with short ranges of volcanic mountains of recent origin. Their general trend seems to be influenced mostly by their relative positions with respect to the great ranges on either side of them—the Sierra Nevada and the Wahsatch Mountains; for the tendency is to run parallel to whichever of these they are nearer to, and in the centre of the basin the general direction is north and south. In crossing the Great Basin, from Donner Pass in the Sierra Nevada to the Wahsatch range at Salt Lake, we passed over no fewer than twenty of these ranges, the basin at that latitude being 700 miles across. On the 35th parallel, nine ranges were crossed; on the 32nd, a less number; as in the one case the distance across was less than 300 miles, and in the other under 200.

The ranges consist chiefly of volcanic tufa, trachytic breccia, trachyte, and diversely-coloured porphyry, all more or less decomposed. They are mountains in miniature, beautiful in outline, variegated by many-tinted rocks, and usually perfectly bare of trees, or even shrubs. They show on their sides the effect of rains and water to an enormous extent, for the volcanic rocks of which they consist are easily decomposed by the elements, and then washed away. The ranges may in former times have been very long and continuous; but it is evident that, ever since their formation, water has been cutting them through, washing them down, and filling up the valleys with drift from their sides.

The average width of the ranges would be about twelve miles, the height above the general level of the basin from 1,000 to 4,000 feet. The valleys are mostly about twenty miles wide, and often of great length; but more frequently they are limited above and below by transverse ranges, which, however, are sometimes washed down to very inconsiderable dimensions, so as to form a number of separate little basins. The well-preserved water-marks which are everywhere visible indicate extreme dryness, upon which dryness most of the peculiar characteristics of the country depends. Artemisian scrub (sedge-brush) and grease-wood* alone spring from the dry, parched earth, except where some stream of unusual persistence supports a row of cotton-wood trees† and a few acres of grass along its edges. From the decomposition of volcanic rocks, the soil in its ingredients is very rich, and, where irrigation can be supplied, yields most abundant crops. There are broad, level districts, however, called by the settlers "alkali flats," which are covered with salts, usually nitrate of soda, and are thereby rendered perfectly barren. These white, glistening sheets, in the dry, unsteady atmosphere of the desert, form the most tantalising mirages to which a thirsty traveller could be exposed. At certain seasons they are covered for a short time with a thin coating of water—the local drainage of the surrounding district—which is soon dissipated by the scorching sun.

The plateaux of the basin-region were undoubtedly the last portions of the Western Continent raised from the sea—the last from which the Gulf of California retired. Even now subterranean fires are active, and the process of gradual upheaval may still be going on. Earthquakes are frequent; mud volcanoes are still to be found in places; huge cracks in the earth's surface have occurred within the memory of living men; craters, recently active, dot the whole district; and hot springs are so numerous that I have counted fifty-two jets of steam issuing from the ground like pillars of smoke in one valley alone.

* *Obione canescens.*

† *Populus angustifolia.*

When the Great Basin came into existence, or rather emerged from the water, there were dry lands and mountains east, west, and north of it, shutting out from it the moisture of the Pacific Ocean, as well as any that might travel thither from the far-off Gulf of Mexico. The climate may be considered to have been then not unlike that of the present time, so that the rain-fall was far less, even in the new-born "Basin Region," than it was over the Colorado Basin in its primeval state, which was then washed by a broad Pacific Ocean. The effect of these climatic peculiarities was that a sufficient quantity of rain never fell upon the "Basin Region" to form a complete system of drainage from the highest lands down to the sea.

We can easily conceive that, in the formation of an extensive drainage system, the little primitive streams form lakes at the first serious obstacle met with in their course. These lakes, when full to overflowing, find at length some outlet, and wear the channel of exit deeper and deeper, until the obstacle is overcome, and the lake drained. Thus lake after lake is formed, and disappears as each succeeding obstruction is cut through, until the independent streams, having sought the lowest levels of the country, unite their waters into a single channel, and so pass into the sea. There is nothing whatever in the physical construction of the Great Basin to have prevented the formation of one great river, emptying into the Gulf of California, either as an independent stream or as a tributary of the Rio Colorado. It is not because the Great Basin is really a complete basin without an outlet, or with a rim presenting an insurmountable barrier to the drainage, that its waters do not escape to the sea, but rather because it is not a single basin at all, but a collection of perhaps hundreds of basins, which have always remained in their primitive isolated condition, each with its stream and its lake at the end of it, and because the separate streams have never had force enough to break through the barriers which all streams have at first to encounter, and to unite their waters, so as to form a complete drainage system. There is no doubt that formerly the atmosphere was more humid, and that more rain fell, for the remains of fresh-water shells of the present epoch, covering large tracts of desert, prove the existence at one time of lakes much greater in extent than any which can now be found; but instead of being filled to overflowing, and breaking through their barriers to the sea, these lakes lost more water by evaporation and percolation than their tributary streams supplied, and thus were gradually dried up.

The drainage, then, of the Great Basin is in a primitive stage of existence, and will probably always remain so. Wherever in this region there are lofty mountains, there we are pretty certain to find a lake proportionately great. If the lake has no outlet, it of necessity contains salt water, which becomes salter and salter as time advances, from the concentration, by means of evaporation, of the salts washed into it from the decomposed rocks of the mountains. But when the lake has an outlet, the water is, as usual, fresh. Great Salt Lake is an example of the former class; Utah Lake of the latter. Most of the lakes, however, are not permanent; they form broad sheets of water after rain, but are perfectly dry and barren during the greater part of the year. They vary greatly in elevation and size. Great Salt Lake exceeds 4,000 feet above the level of the sea; Sevier, 5,000; Lake Tahoe, 6,250; Monro Lake, 6,454; Pyramid, 3,940; Williamson's, 2,388; Morongo Sink, 1,500; Mojave Sink, 1,000; and Perry Basin, 530.

Two depressions, at least, are below the level of the sea: the one is a large saline flat, situated a little north of the Mexican boundary line, which is usually called Soda Lake. It is about 70 feet below tide-water, and although nearly always perfectly dry, a long dyke, known as Hardy's Colorado or New River, flows through the desert towards it when the Great Colorado is flooded. Leaving the latter stream about half-way between Fort Yuma and its mouth, it receives the back-water of the Colorado, flows northward across the boundary line, and becomes lost in the desert before reaching Soda Lake. If it had sufficient volume, this large depression would become filled with fresh water—a very desirable result.

The most wonderful depression, however, is Death Valley, the sink of the Amargoza, which is 175 feet below the sea. Although this depression is an arid desert, an enormous area of country drains into it, extending from lat. 37° to the San Barnardino Mountains, from which the Mojave River rises, and comprising not less than 30,000 square miles. At first sight it might appear that the existence of these depressions rather contradicted what I have said as to the causes which have produced the hydrographic peculiarities of this "Basin Region." But a glance at the Colorado Basin at once, I think, decides the question. Let us suppose that a humid climate had poured abundant rains upon the table-land, 1,000 feet high, which separates Death Valley from the low lands at the head of the Gulf. A fine sheet of water would cover Death Valley, and this lake would have had an outlet to the sea through the opposing table-land. If 7,000 feet of table-land yielded to the waters of the Rio Colorado, surely 1,000 feet of similar formation would not prevent the overflow of a large lake from reaching the coast.

Great Salt Lake, the largest in the Great Basin, is about sixty miles long, by ten miles broad—a very small sheet of water compared with the fresh-water lakes of the Eastern States, or those of Central Africa. But there is abundant evidence all around it to prove that in former times it covered an area twice, if not thrice, as great as it occupies at present. Of late years this lake has steadily been rising; so steadily that, if this rise continues, thousands of acres which are now lake-shore will soon be re-covered with water. It is a question of considerable interest whether the large tracts of land now irrigated by the Mormons have not caused this result, by considerably extending the area of evaporating surface, and increasing, as a consequence, the yearly rain-fall.

The largest stream in the Great Basin is the Humboldt, which is more than 500 miles long, and passes from east to west across the entire district, at its northern part, before emptying itself into Humboldt Lake. The valley of this river is said to be generally so sandy as to be worthless even if irrigated; but this conclusion may be premature, for many of the lands most productive when irrigated, look sandy and utterly worthless in their parched and wild condition. Much of the Rio Grande valley bears testimony to the truth of this assertion. Reese River fertilises a narrow valley of about 100 miles in length, near the centre of the basin, in which are several agricultural settlements. The same may be said of the Tuckee, Carson River, Walker River, and some others, which flow from the eastern slopes of the Sierra Nevada into lakes in the desert. Along these, and the western slopes of the Wahsatch Mountains, a great many spots are favoured with enough running water to support a considerable population; and, in fact, all over the Great Basin the most tempting localities are being colonised and settled up by little communities of Mormons from Salt Lake City, who are all agriculturists, and nothing else.

If, however, the Great Basin had only these attractions to hold out to emigrants, it would be a region of as little interest as any on the globe; but amongst these barren, monotonous ranges lie the vast deposits of silver ore which, since the discovery of the Comstock lode, have been found to be scattered throughout the entire region. The lode just named has yielded, in the four years ending April 1st, 1866, 51,380,500 dollars, or upwards of £11,000,000 sterling. Its present annual yield is about 600,000 pounds avoirdupois of silver (containing more or less gold), worth about £4,000,000 sterling, a yield which exceeds the present yearly total of all the silver mines in Mexico. One mine company alone—the Savage—during 1867 paid in dividends a larger sum than that derived from all the metallic mines of England and Wales put together. Any day we may hear of another "Veta Madre" (as the Mexicans call one of these wide rich veins) being discovered, for by far the greater part of the basin is as yet quite unknown, even to the indefatigable prospectors, who brave all privations in the search for the precious metals. Mr. Ross Brown, in his last Report on mining operations in the districts west of the Mississippi, gives the total yields of the gold-fields of California, for the year 1867, at the small sum of 25,000,000 dollars, while that of Nevada is 20,000,000 dollars, of which the Comstock lode furnished about 14,500,000 dollars, thus leaving the large amount of over 5,000,000 dollars as the yield of the newly-discovered districts.

Enough, however, has been said to give a general idea of the Great Basin, so we shall leave the further consideration of this subject, and of the probable results to be expected when two great railways are completed across it, to be more fully discussed in subsequent pages.

The short reference already made in this introduction to the drainage of California, and to the mountain ranges of that State, will suffice to give a general idea of "how the land lies" between the Sierra Nevada and the Pacific coast.

PART I.

FROM THE MISSISSIPPI RIVER TO THE RIO GRANDE DEL NORTE.

FROM THE MISSISSIPPI RIVER TO THE RIO GRANDE DEL NORTE.

CHAPTER I.

THE CAPITAL OF THE WEST.

Arrival at St. Louis.—The Mississippi.—History of St. Louis from its first settlement in 1764.—Its present prosperity and future prospects.—Natural resources of Missouri.—Depression caused by the War.—Pernicious effects of Slavery.—St. Louis the Capital of Missouri.—St. Louis the Centre of Commerce throughout the Mississippi Valley.—St. Louis the most natural spot for the Federal Capital.

The moment I felt the train slackening its speed, as it neared St. Louis, I threw open the window and looked steadily ahead, to catch a first glimpse of the Mississippi. It separates the railway terminus from the city; and, as the line runs close to the river for a short distance, a fine view is gained of its grand proportions. It is marred considerably by the total absence either of large timber or good houses on the eastern bank; but the opposite side, marked by the broad bustling quay, and a string of many-storied river boats, two miles in length,—the dense piles of warehouses and the rest of the city built on a higher level, forming the background,—is perfect as a picture of American progress. On leaving the train, on the eastern bank, you find half-a-dozen large omnibuses, drawn by four horses, and the usual accompaniments of hacks and carriages, waiting to receive you. When the omnibuses are filled, they all start down to the river-bank and drive straight on to the ferry-boat, closely followed by the small fry. The omnibuses and carriages take up one side of the boat, the carts and wagons fill the other; the whistle sounds, and off we go, apparently up stream, but we soon find that the current is carrying us across, and that in reality we only hold our ground against it. It is now that we fully realise the width of the river and the great rapidity of its current.

The St. Louis ferry-boat will soon be a thing of the past, for the foundations of a splendid bridge are already laid. It is, I believe, to be built on arches for some distance on each side, and to be united in the centre by a suspension bridge 600 feet in length, and so lofty that the largest river boats may pass beneath it without lowering their chimneys. This bridge, like that of Niagara, is to combine road and rail, one above the other. Besides this, a tunnel is also in contemplation, which will supply to another section of the city similar advantages.

It would not, I think, be just to St. Louis to leave it behind us without devoting a few lines to its history and future prospects. The capital of the West may be taken as a sample of those large commercial centres of the United States whose growth has been so marvellous.

Not more than a century ago, in the summer of 1763, Pierre Lascede, with a party of French trappers and traders, started up the Mississippi, from New Orleans, for the purpose of establishing a trading-post at the junction of the two great rivers—the Mississippi and the Missouri. After five months' travel, their destination was reached, but the low lands and treacherous banks at the junction did not satisfy them; so they retraced their steps to a rising ground which they had passed twenty miles below on the western bank; and here, on the 15th of February, 1764, the birthday of Louis XV., they landed and established a permanent settlement. Like most French colonists on the American continent, these men managed to live in peace with the Indians. Instead of trying to "improve" them off the earth, they did not scruple to unite with them in social bonds, which resulted in the rising generation being mostly half-breeds. The trader's hut was little better than a wigwam, and he himself became after a time not so far removed from a red-skin.

The same year in which the colony was founded, all the country east of the Mississippi came into the hands of the English; and several French settlers, who did not relish a change of nationality, joined the little colony at St. Louis. No sooner, however, had they arrived, than fresh tidings came that all the French possessions west of the great river had been ceded by Louis XV. to Spain; and thus St. Louis became an outpost of Spanish Louisiana, and remained so for thirty years. During this period, trade with the Indians, and that alone, caused a gradual increase, more, however, of the wealth than of the population in the settlement; and in 1804, when Spanish Louisiana became part of the United States, the colony scarcely numbered 1,000 inhabitants. What a startling event this must have been for the little community of Frenchmen, squaws, and half-breeds! Freedom of worship and a post-office were at once established; in 1808 there appeared a newspaper; in 1809 a fire company; in 1810 road-masters were established; in 1811 two schools—one French, the other English—and a market were opened; in 1812 the first Mission Fur Company was formed, which revolutionised the entire fur trade; in 1813 lead mining commenced; and in 1815 the first steamboat was seen at St. Louis. Not content, however, with these innovations, the

Anglo-Saxon intruders set to work at that early day to Philadelphianise the "city," or rather to reproduce Philadelphia, then their model of perfection, on the banks of the Mississippi.

Five years after the era of steamboat navigation, the question of slavery came before the people of St. Louis, and they, after prolonged deliberation, voted in favour of it; by which act they saddled upon the whole of Missouri an institution which was thoroughly unsuited to the State, situated as it is in so northern a latitude, and containing within itself such varied sources of wealth.

From 1820 to 1830 the tide of emigration gradually crept westward, until at last, between 1830 and '35, the discovery of the enormous agricultural value of the prairie regions, which occupy so large a portion of the eastern part of the Mississippi basin, caused the wave of emigration to pass like a flood over all that country. Chicago was unborn, and the great north-west was almost unknown when St. Louis became the outlet for the produce of the western prairie farmer. From this epoch her population has rapidly increased, her wooden shanties have been replaced by large buildings of brick and stone, her narrow French streets have become broad avenues, and the merchants of St. Louis have gradually amassed an amount of wealth far greater than those of any other city west of the Alleghany Mountains. Nothing has more forcibly shown how solid the commercial prosperity of St. Louis really is than the wonderful manner in which her inhabitants have withstood the prolonged depression caused by the rebellion. By far the majority of the influential men in the city were Secessionists; still the Republican minority, with the aid of the Germans, who represent a population of 30,000 souls, and assisted occasionally by the central government, defeated all attempts at carrying the secession ordinance, and thus kept Missouri within the Union. The State, however, being a border State, was swept over and over again by the contending armies; so fiercely, indeed, did the passions of civil strife rage in the breast of the Missourians, that where one party held possession of a district, none of the opposite faction could live therein, all had to leave and seek homes elsewhere. With the country in such a condition for at least the first two-thirds of the war, complete stagnation of trade, and something nearly resembling a state of siege, existed in the city. Yet, notwithstanding this, scarcely a mercantile house of any note "fell through," and nearly all the merchants were able to resume business on their former firm basis immediately after the war had ceased.

The following table shows the gradual growth in population of St. Louis:—

As a trading-post.		As a commercial centre.	
A.D.		A.D.	
1764	120	1830	5,852
1780	687	1840	16,469
1799	925	1850	74,439
1811	1,400	1859	185,587
1820	4,928	1866	204,327
		1867	220,000

What shall we say of the present city? The traveller from the east finds himself at home directly; he knows almost where every house is situated, and can go straight to his destination without asking the way; for the streets, which run parallel to the river, are all named, as in Philadelphia, 1st, 2nd, 3rd, &c., from the quay inland; while the familiar names of Chestnut, Walnut, Spruce, and Pine meet him at every corner, since these avenues (also according to Philadelphian rule) cut the numbered streets at right angles. There are no natural limits to the expansion of the city.

Most of the streets are wide and beautifully paved; the houses are fine, and, until three days before my first arrival, the largest hotel in the States was located here. I only saw its smoking ruins. As the traffic is not of necessity confined to any single thoroughfare, on account of the chess-board regularity of the streets, an air of quiet and repose usually rests upon the city. Signs of a considerable French population are everywhere to be recognised, and that too, not only in the shops and cafés, but about the streets; society also is softened and refined by it, trade is less wild and enthusiastic, pleasure is more sought after and enjoyed. Sunday also wears a characteristic garb, for half the population are Roman Catholics.

Enough, however, has been said of St. Louis past and present. Let us take a glance at the probable future of this city, which for nearly half a century has been trebling its population every ten years.

St. Louis is, in the first place, the commercial capital of Missouri, a State unsurpassed by any of her sisters in the plentitude of her natural resources. The soil throughout almost the entire area of 65,037 square miles[*] is most fertile and well watered; it consists of alternate tracts of heavily timbered country and prairie land. Some of the finest districts are picturesquely undulating; others consist of the perfectly level bottom-lands of the Mississippi and Missouri. In some counties the rocks are partly of volcanic origin, in others the limestone and carboniferous strata prevail. The composition of the soil being so various, the number of productions is unusually great. Besides the cereals, all of which thrive luxuriously, hemp, tobacco, the grape-vine, sorghum, imphee, and cotton in the south, are among the most

[*] Area of England and Wales = 58,320 square miles.

important. Forty-five per cent. of the hemp grown in the United States comes from Missouri, the tobacco is equal to that grown in Virginia and Kentucky, and the manufacture of wine is progressing most satisfactorily, both as regards quality and the yearly yield per acre.

As regards the mineral wealth of Missouri, more than one-third of the entire State lies upon a vast coal-field, many veins of which average 15 feet in thickness. Iron of the best quality is very abundant, not below the surface only, but above it; for a few miles from St. Louis there are two mounds, Pilot Knob, 585 feet in height, and Iron Mountain, which covers an area of 500 acres; both of these are solid masses of the richest iron ore. Extensive deposits of lead and copper are also situated in the vicinity, and from these mines short lines of railway carry the coal, iron, lead, and copper to the furnaces and factories of St. Louis. Quite recently, tin has been discovered in large quantities; while zinc, platina, silver, gold, nickel, pipe-clay, marble, granite, and other kinds of building-stone are amongst the mineral productions of different parts of the State.

There can be no question but that slavery has greatly retarded the development of all this natural wealth, for it has, to a great extent, kept out the industrious emigrant of small capital who was willing to farm with his own hands; and it has also acted as a continual damper upon all those sources of industry which are dependent upon skilled labour; so that St. Louis was checked in her manufactures by the same influences which kept back the mining and agricultural interests of the country at large.

Now, however, slavery is no more, and the immense tracts of uncultivated land, which at the termination of the war amounted to at least, 25,000,000 acres, have since been nearly all taken up, either from the Government under the Homestead Act, or by small purchasers from the original great land-owners. The effect of this influx of small farmers into Missouri is well shown by the corn market receipts. In 1860 (before the war) the corn receipts amounted to 4,250,000 of bushels. In 1863 (during the war) they fell to less than 1,000,000. In 1865 (after the war) they again rose to 3,000,000; and in 1866 they reached the unprecedented amount of 7,233,671 bushels.

There is scarcely an industry which has not made almost as rapid growth. The quantity of machinery and iron goods now manufactured at St. Louis is enormous. The flour trade is probably the largest in the States; next in importance come the sugar refineries; these and many other manufactures are rapidly increasing in numbers and importance, as railway extension and the advance of settlement westward, enlarge year by year the market to be supplied by them.

St. Louis is not, however, the commercial capital of Missouri only, she is also the great trading centre of the Mississippi valley. More than 260 river steamers are employed in her carrying trade; and I have counted sixty of these curious three-storied structures, combining the hotel above and the merchant ship below, lying along the quay. These boats ascend the Mississippi 740 miles, to St. Paul, and descend it to its mouth, 1,212. They go up the Missouri 685 miles to Council Bluff, and traverse the upper part of the river for 1,166 miles farther. The Ohio River takes them to Pittsburgh, 1,195 miles distant, and its branches are navigable still farther up, into the oil regions of Pennsylvania; and although the contemplated canal, which is to connect the waters of the Upper Mississippi with the Great Lakes, is not yet in being, still the navigable portion of the Father of

Waters and his tributaries, representing a total length of 12,000 miles, places St. Louis in communication with every city of importance in the largest river basin on the globe. It cannot be said that man is not striving to make the most of what nature has done for St. Louis. Apart from the many railways which already radiate from the city towards every point in the compass, there is one which is destined, before many years have passed, to unite her with San Francisco on the Pacific coast. When this trans-continental highway is completed we shall not only see the steamer laden with furs from Minnesota, lying by the New Orleans orange boat at the levée of St. Louis, but trains, carrying the silks and teas of China on the one hand, and the choicest products of Europe on the other, shall enter the city from opposite directions, and discharge their freights under the same roof.

There is yet another consideration for the future. Each succeeding year adds so materially to the political influence exercised by the Western, as well as by the Pacific, States in Congress, that a national question of no small interest to St. Louis must soon be brought forward for public consideration. If the great Republic is destined to continue its growth as one nationality, Washington cannot long hold its position as the political centre of the whole country. Apart from its geographical position, there is little doubt but that the theory of arbitrarily choosing a particular spot for the political centre, and of thus isolating the executive and commercial capitals, has not worked well. Abuses have crept into many of the State legislative bodies, if not into Congress itself, which could not have successfully evaded the vigilance of a large number of intelligent lookers-on, who, being of necessity on the spot from interests, setting aside politics, would have watched everything, and have protested publicly against any such abuses. It is, in fact, far better to follow the natural tendency towards centralization, and to place the seat of Government, whether it be that of a state or nation, in the most convenient and central of its great commercial towns, where energy, talent, and wealth are of necessity to be found; for in such a centre the Government is assuredly most secure.

Where then shall the Federal capital be placed, seeing that Washington is neither a commercial, agricultural, nor geographical centre? From the reasons I have named, it seems more than probable that the final answer will be at St. Louis. Although two-thirds of the territory of the United States lie to the west of the Mississippi, yet this region, taken as a whole, can never support so great a population as the remaining eastern third; it has no navigable rivers of any importance, and will never produce an inland city which can rival, in any respect, the commercial capital of the Mississippi valley.

CHAPTER II.

EASTERN KANSAS.

The Railways running westward from St. Louis.—Kansas City and Leavenworth rival cities.—The wonderful energy of their Inhabitants.—Railway Connections.—How American Cities are formed.—The Social System as seen in Kansas.—Continue our journey to the end of the Kansas Pacific Railway.—How Towns spring up along the Line.—Salina the Terminal Depôt.—Camp Life at Salina.—Our Visitors and their Adieus.

Distance travelled 471 *miles.*

Two railways cross the State of Missouri, to connect St. Louis with Kansas City, a distance of about 282 miles. The one is the Pacific Railroad of Missouri, running on the south bank of the Missouri River; the other is the North Missouri Railroad, traversing the valley on the northern side. The scenery on the more southern of these roads—viz., that over which I travelled—is very beautiful. At one time we would skirt the broad and majestic river; at another dive into the forests—for all this country is still thickly covered with hard timber; and then shoot over one of the innumerable brooks and rivulets which crossed our way, so that a constant succession of leafy vistas delighted us as we passed. Farther west, much of the country was gracefully undulating; and although we passed no large towns, villages were very numerous; while the well-made fences and good-sized farm-houses, which could be seen across many a "hundred-acre clearing," spoke well for the richness of the land, and the prosperity of the husbandman.

At the entrance of Kansas, exactly on the eastern boundary line of the State, two large towns, the fruit of commerce, have sprung up—Kansas City and Leavenworth. The former is situated on the southern bank of the Missouri, just at the point where that stream makes its huge bend northward, and receives the waters of the Kansas River. Its population is about 18,000. The latter lies also on the left bank of the Missouri, about thirty miles above, and to the north. It is beautifully situated, on extensive heights overlooking the surrounding country, and has long been the most favourite military post west of the Mississippi. It claims a population of from 27,000 to 30,000.

Great rivalry exists between these young giants; they are both striving for an enormous prize, and never were two horses at the Derby more evenly matched.

The tendency of development in the inland States has been to raise, at distances of from two to three hundred miles, large and independent commercial centres; such for example as Pittsburgh, Buffalo, Cleveland, Cincinnati, Chicago, and St. Louis. The advantages of position on the great lines of travel have, more than anything else, determined the points at which such cities as these should eventually spring up. At first they simply start as active distributing posts to the countries around, selling goods manufactured elsewhere, and buying for transportation the agricultural produce of the neighbourhood; then as the population increases, factories rise, and the raw material is manufactured on the spot. Soon the mineral wealth of the country becomes developed, and as the coal, the iron, the copper, or the lead flow into the busy centre of capital and construction, rolling-mills and machine-shops are soon hard at work, and the plough, the iron rail, and the steam engine, with all other sorts of manufactures, are produced on the spot, and an industrial centre, complete in itself, is thus established.

There is no London or Paris in the United States, there is no single nucleus, to which all who can resort for the enjoyment of a three months' season; but when I pass from one of these American cities to another, when I find each with its opera-house, and theatres, its parks and suburbs, its elaborate system of railways radiating from it, its distinct society, acknowledging no superior, I do not recognise a large country town, but a young capital rapidly advancing to maturity. As years go by, and the population is numbered, not by the thousand, but by the hundred thousand—when we begin to talk of the wholesale part of the city, the best street for shopping, and the correct part to live in—for I fear even America is not free from vanity and Mrs. Grundy;—when, in fact, we commence to be aristocratic, and ask, Who is who? we find, to our astonishment, that the rich old gentleman we have learned to look up to was once the happy owner of no more than an acre of waste land on Main Street, and that all the families at whose hospitable fireside we received a hearty welcome, have an unlimited belief in the advance in value of real estate. Such in short will suggest the history of the cities I have named.

The merchants and tradesmen of Kansas City and Leavenworth know all this perfectly well. They look around them and see that 2,500 miles of navigable waters, leading far up into the north-west, pass their doors. To the east lie the rich agricultural lands of Missouri, extending to St. Louis, 300 miles distant; to the west, one-half Kansas is not inferior to Missouri in soil and climate; while to the south, the fertile Neosho valley, and the coal and marl-fields of South-Eastern Kansas, complete the vision of future greatness. They recognise fully the importance of the position, the natural wealth of a locality which has out of its abundance produced twin cities almost on the same ground; but as both cannot grow to equal greatness; as one is destined to remain a country town, the other to become a large and flourishing city, both parties put their shoulders to the wheel, and turn their energies to the perfecting of those connections which are to unite them to the rest of the continent. But here, again, fortune does not seem inclined to favour one city more than the other. The Southern Trans-continental Railway has given to each an eastern terminus; that at Kansas City unites with the railways from St. Louis, that at Leavenworth with those from Chicago and the north-east; the forks unite at Lawrence, distant about 30 miles, and continue onward as a single line. So much for the railroads, destined to give them a western outlet at San Francisco, on the Pacific, just 2,000 miles distant. Due south of Leavenworth, on the 95th meridian, lies the fine harbour of Galveston, the natural outlet on the Gulf of Mexico for all this region. A railroad to this port also, has been commenced, and, like the Kansas Pacific, starts from Kansas City as well as Leavenworth. Both forks are to unite some 100 miles to the south, and continue onwards as a single line, traversing regions of unrivalled richness, including the coal-fields of Southern Kansas, the Indian territory, and Eastern Texas. To connect with the civilised world east of the Missouri, this river must be bridged, and, in the matter of bridging, Kansas City has beaten Leavenworth; her bridge is finished, and the trains of two railways daily pass over it. But the men of Leavenworth have already set to work; and although the river is much more difficult to bridge there than at Kansas City, they will undoubtedly do it before long, thus uniting the Kansas Pacific Railroad a second time with those of the east and north-east, so that they can compete on almost equal terms with their rivals for the great through trade of the West.

Had it been possible, I should have prolonged my stay amongst the people of Kansas, for their social system is peculiar. The State well deserves its name—"The Paradise of Petticoats"—for, disregarding its early existence, when, as "Bleeding Kansas," it passed through a baptism of blood, and only studying the new life upon which it has since entered, we find that if woman reigns supreme anywhere upon earth, it is here. All the advanced form of thought upon education and woman's rights have been imported direct from the New England States, and have quickly developed in this virgin soil to an extent hitherto unprecedented. Schools spring up like mushrooms wherever a dozen houses can be found within a mile of each other, for the "progressive" inhabitants are always looking ahead, and consequently prepare for the expected families.

From the sixth annual report of the Superintendent of the Public Institutions, the following statistics have been gleaned:—

	1865.	1866.	Increase in a year.
Number of Free Schools . . .	721	871	150
,, Teachers	997	1,086	89
,, Scholars	26,341	31,258	4,917
	Dollars.	Dollars.	Dollars.
Teachers' Salaries	87,898	116,924	29,026
Assessed in districts for Schools	106,589	192,620	86,031

Besides these free schools, there are 83 select schools, with 113 teachers, and 3,228 scholars; 3 academies and 9 colleges, numbering 39 professors and teachers, and 948 students, subscribed for and supported by members of sectarian denominations, political or religious; lastly, there are three high schools, or State insitutions, viz., the State Normal School of Emporia, in Lyon County, for the special education of teachers; the State Agricultural College, at Manhattan, endowed with 90,000 acres of fertile land; and the State University, at Lawrence. Neither in the granting of degrees, nor in the course of instruction, is the slightest distinction made as to sex. "This, without doubt," says the President of the University, "is both just and expedient. It is no small honour that the Mediterranean State should be the first to recognise the rights of woman in her educational system." All through the States, in most ladies' schools, one evening in the week is set apart for the reception of the male friends and brothers of the girls, so that, from infancy, the sexes are but little separated. The progressive school at Kansas hopes soon to do away with ladies' academies altogether, so that the gratifying sight now to be seen at these three high schools, of young men and maidens reciting together in the same classes, will become the universal custom. Can it be wondered at, that scarcely a political contest takes place anywhere in Kansas, at which petticoats are not well to the front; and that woman's suffrage and equal rights form a part of each platform in every election? Bold, indeed, would be the man in Kansas who dared to oppose openly this phalanx of political Amazons.

Let us, however, bid good-bye to the busy towns and the pushing traders, to the railway connections, the Missouri River, and to the lady politicians. "Westward, Ho!" is our watchword, as rapidly the railway takes us past Lawrence, noted for its youthful factories; Topeka, the Kansas capital, famed for its State-house, now being built, its college and its female institute, and Manhattan, remarkable for the beauty of its situation, and agricultural school. Next comes Junction City, whose fine building stone is the best in the State, and whose commercial enterprise is fast converting it into a fine, well-built town; then Solomon, surrounded by salt springs, and situated at the entrance of a fertile valley, 250 miles long. Lastly, we reach Salina, 185 miles west of the Missouri, where we exchange the cars for the camp, the locomotive for the mule team.

On the 1st of June, 1867, this little town of 1,000 inhabitants was the terminal station at the end of the line. Eight months afterwards, when we were hastening home, the train took us up 100 miles to the west, and two other towns—Hayes City and Ellesworth—had sprung up west of it. The eight towns I have just named are not temporary trading-posts, called suddenly into existence by the presence of a large staff of railroad officials and workmen, and destined to perish, one after the other, as the customers pass onward with the advancing line. At one time, each of these places, besides many others now no more, served its time as the terminal depôt, and was thereby forced into existence with hot-house rapidity. But the natural advantages of their positions, situated as they are for the most part at the mouths of streams,—such as the Big Blue, the Republican Fork, Solomon Fork, and Big Creek,—which water rich valleys of 100 miles and upwards in length, not only ensure their future existence, but add to their size and importance month by month, as settlers arrive and bring the lands of these valleys under cultivation.

Wholesale town-making may not be a romantic theme, or one capable of being made very attractive to the general reader; but it is the great characteristic of this part of our route, and is only to be seen to perfection along the line of these great railways. On the Platte, where the central line across the continent often advances at the rate of two miles a day, town-making is reduced to a system. The depôt at the end of the line is only moved every two or three months; and as rich valleys are far scarcer in this section of country than in Kansas, the town usually moves also, while nothing remains to mark the spot where thousands lived, but a station, a name, and a few acres of bare earth. Last winter, Cheyenne was the terminal depôt on this route, and increased in size to 5,000 inhabitants. A man I met at Denver, who had just come from Cheyenne, told me that while he was standing on the railway platform, a long freight train arrived, laden with frame houses, boards, furniture, palings, old tents, and all the rubbish which makes up one of these mushroom "cities." The guard jumped off his van, and seeing some friends on the platform, called out with a flourish, "Gentlemen, here's Julesburg." The next train probably brought some other "city," to lose for ever its identity in the great Cheyenne.

The men of Kansas have discovered in these towns as fine a field for speculative amusement as the best managed Homburg could offer. Thousands of dollars are daily won and lost all along the line by speculating in town lots. A spot is chosen in advance of the line, and is marked off into streets, blocks, and town lots, sometimes by the railway company, sometimes by an independent land company. As the rails approach it, the fun begins, and up goes the price of the lots, higher and higher. At last it becomes the terminal depôt—the starting-point for the western trade—where the goods are transferred from the freight vans to the ox trains, and sent off to Denver, to Santa Fé, Fort Union, and other points. It then presents a scene of great activity, and quickly rises to the zenith of its glory. Town lots are bought up on all sides to build accommodation for the traders, teamsters, camp-followers, and "loafers," who seem to drop from the skies. This state of things, however, lasts only for a time. The terminal depôt must soon be moved forward, and the little colony will be left to its own resources. If the district has good natural advantages, it will remain; if not, it will disappear, and the town lots will fall to nothing. Salina, when we were there, was just at this zenith stage of existence; so I shall describe it as we found it.

On the open grass land between the Smoky River and the Saline Fork several broad streets could be seen, marked out with stakes, and crossing each other like a chess-board. The central one was deeply cut up with cart-rucks, and strewn with rubbish. There had been heavy rains, and the mud was so deep that it was almost impossible to move about. On each side of this main street were wooden houses, of all sizes and in all shapes of embryonic existence. Not a garden fence or tree was anywhere to be seen. Still paddling about in the mud, we came to the most advanced part of the "city," and here we found three billiard saloons, each with two tables, and the everlasting bar. Then came an ice-cream saloon; then a refreshment saloon. Next—we could scarcely believe our eyes—appeared the office of the *Salina Tribune* (I will not vouch for the name). All these "institutions," as well as a temporary school-house, and several small well-stocked shops made of wood unpainted, evidently represented first principles —the actual necessities, in fact, of Western life. Opposite was a row of substantial "stores," having their fronts painted. The builder here was evidently a rash speculator. He did not look upon Salina as a Julesburg, but intended to tide over the stage of depression. Each of these houses was already inhabited, and piles of unpacked goods lay fronting them in the streets. On each side was an "hotel," at the door of which—it being just mid-day—the landlord was ringing furiously a great bell to announce to the inhabitants that dinner was ready. And what a dinner!—fried fish, fried mutton, fried eggs, fried mush (a great luxury), fried potatoes, and fried pudding—all swimming in grease; bad coffee without milk, dough cakes without butter, and muddy water out of dirty glasses. Trying to escape up a side street, we discovered the Methodist Chapel, the Land Agency Office, labelled "Desirable town lot for sale," the Masonic Hall (temporary building), and the more pretentious foundations of the Free School, Baptist Chapel, and Episcopal Church. The suburbs consisted of tents of all shapes and forms, with wooden doors; shanties, half canvas, half wood. These were owned by squatters upon unsold lots. All around were scattered the empty tins of the period, labelled in large letters, "desiccated vegetables," "green corn," "pears," "peaches," "oysters," and other untold luxuries.

Still farther from the centre, dotted here and there, white and glistening in the sun, we could see the camps of the "bull trains," each made up of from ten to twenty huge wagons, covered with white canvas, coralled sometimes in the form of a square, sometimes of a circle, so as to form a place of protection if attacked by Indians. An unusually wet season, and the fearful depredations caused by the red-men further west, detained an unusual number of these trains at that time around Salina. Partly shutting out the horizon on two sides, was a continuous belt of rich green trees. These might have been the commencement of a fine forest; but alas! as we came up to them, we found only two rows—one on each side of the river; and beyond, the same broad sea of grass, the undulating plain, relieved only by some distant bluffs. The grass was rich and abundant—a very fortunate circumstance; for everywhere were to be seen the droves of oxen, mules, and horses belonging to the wagon trains, feeding and fattening on their idleness. About the railroad station, and on each side of the line for some distance, lay pile after pile of the munitions, not of war but of peace—iron rails, oaken ties, cradles and pins, contractors' cars, little houses on wheels, trucks innumerable, both empty and full; while at the opposite side to the town, our picturesque little camp of twenty wall tents, formed in a square, and flanked by our wagons and ambulances, lay peaceful and cool on the short green sward.

Our chief, General W. W. Wright, who had already gained for himself lasting laurels by the manner in which he had conducted the railroad operations of Sherman's march through Georgia, made Salina the rendezvous for all our parties. Here many of us met for the first time, and the fortnight's sojourn, spent in completing our organisation and waiting for the weather, passed pleasantly by. Settlers rode into camp from far and near, one with a lump of gypsum, another with a piece of coal, a third with a curious fossil, and a fourth with a block of building-stone—all anxious to know what our geologist, Dr. John Le Conte, thought of their specimens; ready to tell all they knew of the country (especially of the advantages of their own locality), and eager to hear about the intended survey. Then our botanist, Dr. Parry, commenced his rambles amongst the prairie flowers, and very beautiful were these heralds of spring, all quite new to us, though well known to that experienced western traveller. Dr. Lewis, who had no sick to cure in this fine air, would bring in each night some new and curious insect, some wondrous coleopter, to add to his collection. The surveying instruments were unpacked, and Messrs. Eicholtz, Runk, and Imbrey Miller might be seen, each coaching his party, trying his transits and levels, running a line here, and a line there, and getting everything into working order.

My friends, Stuart and Captain Blair, were even in greater demand than any of us; for on them devolved the task of organising the commissary and quartermaster's departments. But as old soldiers, though young men, they were by no means novices in these branches, so necessary in an expedition like ours. And lastly, while unpacking my glass, making my collodion, trying my camera, and fitting up my ambulance, I could not altogether be put down as an idle man. The idle man in fact was not represented.

The day but one before we started was long remembered, and talked over by us around our camp fires.

One of those large excursion parties so much in vogue in the United States, had been given by Mr. John Perry, president of the company. Many ladies and gentlemen from far-off Philadelphia (2,000 miles away), and many more from St. Louis, had all come to learn how railways were built, to travel over the plains, to see a buffalo hunt, and, in many cases, to bid good-bye to sons and brothers already amongst us at Salina.

If senators and congress-men, "literates" and railway kings, could make a party distinguished, this company certainly had no need to fear obscurity. But when we met bright laughing faces at our doors, and heard sweet voices in our tents,—when, for the last time, little gloved hands touched ours, and fair ones wished us "God-speed, and a happy return," I fear we would have forgotten the congress-men's presence altogether, had they not carried off so soon our sisters and friends.

CHAPTER III.

LIFE ON THE PLAINS.

Commence our March.—Frightful Storm overtakes us.—Effects of the Storm along the route.—Buffalo Tracks and Indian Trails.—Mexican Bull Trains.—Reach Fort Harker.—Military Posts of the Western Country.—The Indian Difficulty.—Ellesworth.—Harmless and Poisonous Snakes, Horned Toads, and Prairie Dogs.—Antelope and Buffalo; the First Death.—Indian Troubles ahead.—Reports of Massacres come in from all sides.—Stage-coach attacked.—Reach Fort Hayes.—A Buffalo Hunt.

Distances :—Salina to Fort Harker, 36 miles; Harker to Fort Hayes, 72 miles. Total, 106 miles.

June 7.
Left Salina.

Early on the morning of Saturday, 7th of June, our line of wagons, twenty in number, headed by three ambulances, slowly moved away from our first camping-ground. The weather had been, and was, still very unpropitious; every night, and in fact all night through, the horizon was almost a continuous sheet of flame, and constant thunder-showers drenched the ground, and filled the gullies to overflowing. I have passed through many a thunderstorm amongst the Alps, and have seen "a storm in the Rocky Mountains," in reality as well as on canvas, but nowhere have I encountered one in such perfection as on the plains. Nowhere do the elements appear so frantic with rage. The fight seemed to us almost endless, for if we were not actually on the battle-field, we could see it raging all the same at some point on the horizon. The thunder, I often noticed, was never as loud as I have heard it in the Eastern States and in Europe, but the thick bars of lightning would remain visible for a much longer time, and quiver twice or thrice before they darted into the earth; and the chains of fire would twine like serpents among the clouds with a marvellous brilliancy. About noon, on our first day's march, thick clouds began to creep over the sky, while distant lightning played around as usual. The air was very sultry and oppressive; the mosquitoes unusually annoying. Scarcely had we come in sight of our camping-ground, known as Spring Creek Station, when down came the rain and hail in torrents. Half-a-dozen tents were soon out of the wagons, and with great exertions we fastened them down tight and crept inside. Hour after hour down poured the rain, the thunder and lightning were not an instant still, the low land in front of us was already a muddy lake, and nearer and nearer came the water's edge. At last, just about dark, we were drowned out like rats, and had to hunt for some other resting-place. Wading up to our knees in slush, we crept from one wagon to another as we found them filled with teamsters and troops; for those who had no tents were the first to take to the wagons. All crept in somewhere; and as everything has an end, daylight at last relieved us of any more vain attempts at sleep, and brought the first night of our journey to a close.

All along the Smoky Hill valley this storm had been unusually severe. It deluged the senatorial party, while they were camped at Fort Harker, twenty-four miles distant; and I was assured by some settlers afterwards that for seventeen years such a storm had not visited the West.

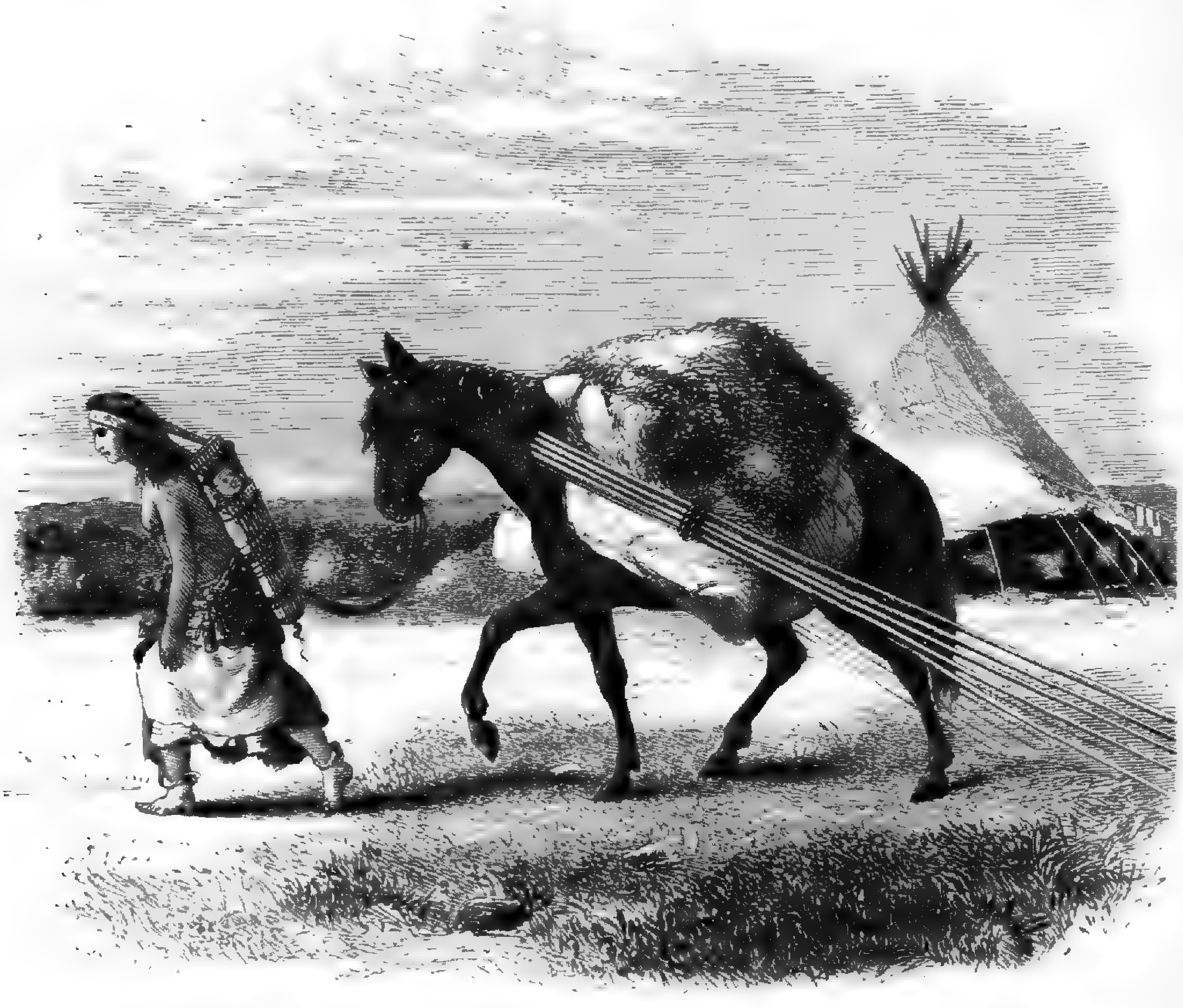
Seventy miles west of Fort Harker, at the next military post, Fort Hayes, the stream which enters the Smoky River at that point, known as "Little Big Creek," rose so rapidly on this same night of the 7th of June, that five men who were sleeping in their huts close to the river-bank were drowned; and one of the officers, with his wife and family, had great difficulty in escaping from the roof of their log-hut on an improvised raft.

The ground was so heavy, and the brooks were so swollen, that our daily travel was slow, and we had considerable difficulty in fording many of the gullies. Curious things are these meandering streams of the plains. The banks are low, and formed of dark, rich clay; the water is muddy, alkaline, and often reddish; there is scarcely a tree, except on the larger streams, to mark their course, and yet their length is almost interminable. A little stream you can jump across has its source, probably, 300, 400, or even 500 miles away in the West.

Before we reached Salina, trees had become very scarce—the cotton-wood and willow on the margin of the streams alone being visible; but as we moved farther, even these ceased to grow, except in favoured spots, which were often miles apart. The short, tender buffalo-grass gradually appeared—at first only here and there, but at last it abounded everywhere; and ever and anon we crossed the well-beaten trail of the monarch of the plains. Buffalo-wallows—round flat basins about three yards in diameter—often covered an acre or two, showing how the animal loves to bathe his irritated hide and scratch his winter coat off by rolling in the mud. With great curiosity we examined an Indian trail, and learned to tell one from that of the buffalo.

The trail of the Plain Indian consists usually of three paths, close together, yet at fixed distances apart. They are produced as follows:—The framework of their lodges or tents are made of long poles which, on a journey, are tied to each side of a pony, and allowed to trail upon the ground. The result is that a long string of ponies, thus laden and following each other, will wear a triple path—the central one being caused by the tread of the ponies, the two outer by the trailing of the lodge-poles.

From Salina to Fort Harker our course took us along the travelled road to Denver and New Mexico, and plenty of company we had on the way. At every mile or so we would pass long ox-trains heavily laden with goods (I have counted as many as eighty wagons in a train), and if *we* found the bad roads difficult, how much worse was the travelling for them! Each wagon carrying from 6,000 lbs. to 8,000 lbs., would be drawn by eight, sometimes ten, yoke of oxen, which number would require about three "bull-whackers" (generally swarthy Mexicans) "to help them along," with their heavy leather thongs. When one of these wagons stuck fast in a gulley, it was amusing to see the enormous amount of brute



Sioux Indian Lodges or Tents; one packed for a journey, the other standing.

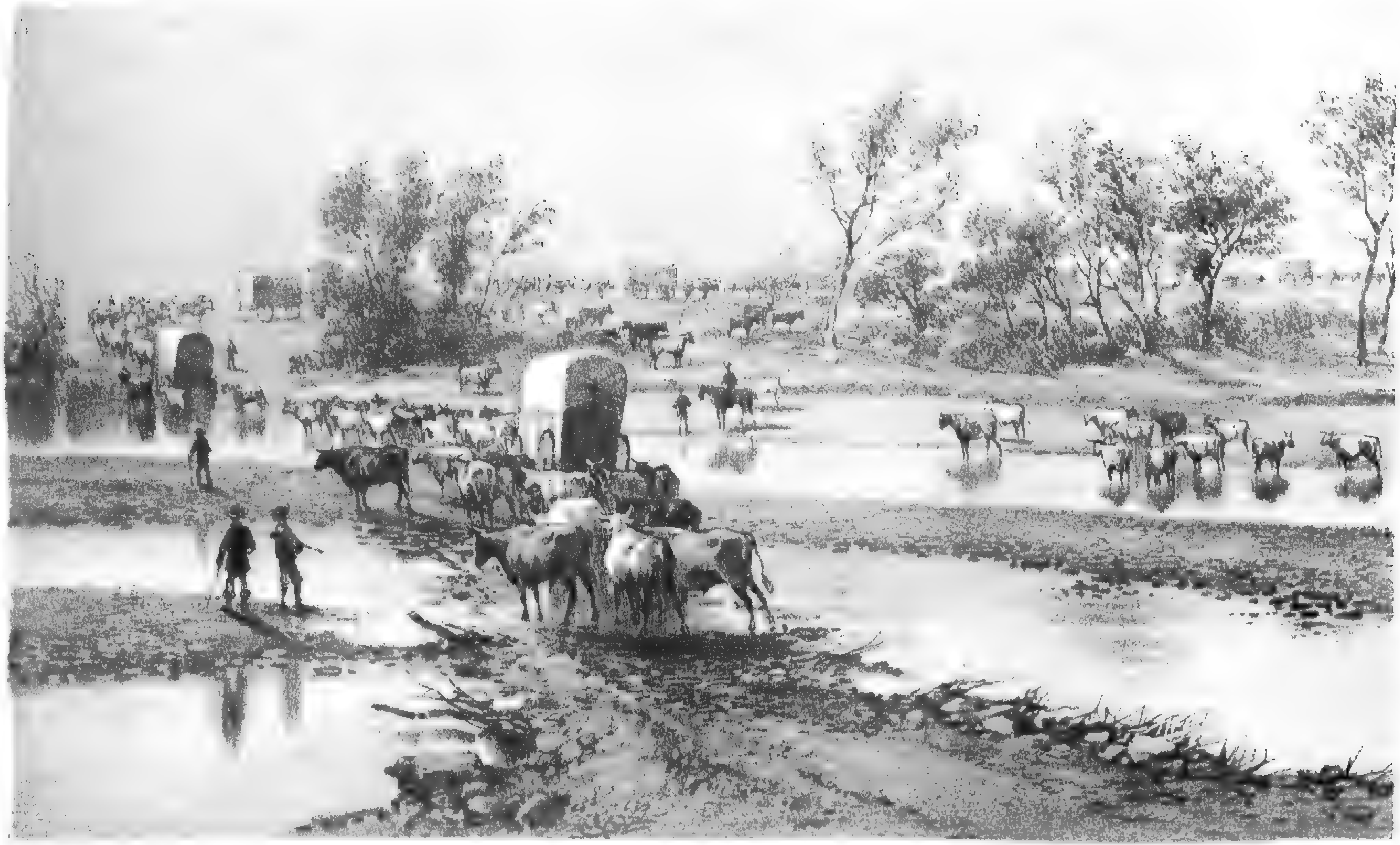
force which was applied to pull it out. The oxen from two of the wagons which had passed safely across would be attached to the one in difficulties, making a continuous string of from eighteen to twenty yoke. To accomplish even this, usually required an amount of swearing and torturing on the part of the drivers which would be startling to the nerves of most men not reared on the plains. When all was ready, and a dozen "bull-whackers" had taken their places along each side of the line of oxen, a frightful shout would fill the air, followed by the fierce cracking of whips on the devoted hides, and the usual chorus of endearing terms. The poor oxen, thus goaded on to madness, would give one tremendous tug, the usual finale of which used to be, not in the least to move the wagon, but to break the thick iron chain which fastened all together. As we retired out of sight over the brow of the next undulation of the plain, we would usually leave our Mexican friends trying in vain to stop the loosened string of oxen (who could not be persuaded they were not dragging something), preparatory to going through the whole process again.

Our general course lay in the valley of the Smoky Hill Fork. Our destination was Fort Wallace, 216 miles from Salina, at which point our survey was to commence.

The rule was to breakfast at 5 o'clock, and start at about 6.30, so as to get over as much as possible of the road before the heat of the day. The rains, however, having cleared the air, there was no necessity to break the march by a mid-day halt, while the cool breeze from the far-distant mountains, springing up usually near noon, made travelling even in June and July by no means disagreeable. On the afternoon of the 10th we camped at Fort Harker, thirty-six miles from Salina, a well-built, three-company post, with spacious storehouses filled with munitions of war, but, like all these military establishments, carrying out in no particular the term "fort." Along the main lines of travel throughout the whole western country, at distances of from 60 to 300 miles apart, the United States Government are obliged to maintain a great number of these little military establishments. There are upwards of fifty of them in the territories we passed through *en route* to the Pacific. In many instances not a white man lives in the intervening country, and yet without them overland travel would be impossible. Too thinly garrisoned to wage aggressive war against the red-men, they afford the only protection the emigrant or the traveller has to hope for on the way.

It is hard to conceive any life more lonely or monotonous than that of the two or three officers stationed in one of these distant forts. It is often dangerous even to hunt in the country around, for the sneaking Apache or the treacherous Comanche may be lurking hard by, like a snake in the grass. There are no rivers to fish in, no neighbours to visit, and as for books, they are soon read through. I remember the lamentation of one of these poor officers. On leaving Fort Leavenworth with his regiment for distant service, and anxious to take with him a good stock of books, he applied to the quarter-master, to enable him to transport this extra quantity of personal baggage. "Government regulations were imperative; only so many pounds could be allowed—regretted not having the power to grant the favour asked." Such was the reply. So the extra weight of books had to be abandoned.

Another officer afterwards applied, and stated his case. He was the fortunate possessor of two ten-gallon casks of the best Borbon whiskey, "So unusually fine that you must allow me to send you up a sample, you can then appreciate more fully,"



said the bashful suppliant, "what my feelings must be at the thoughts of leaving it behind." "My dear sir," replied the quarter-master, touched to the heart, "of course you can take it; anything in reason, my dear sir, anything in reason."

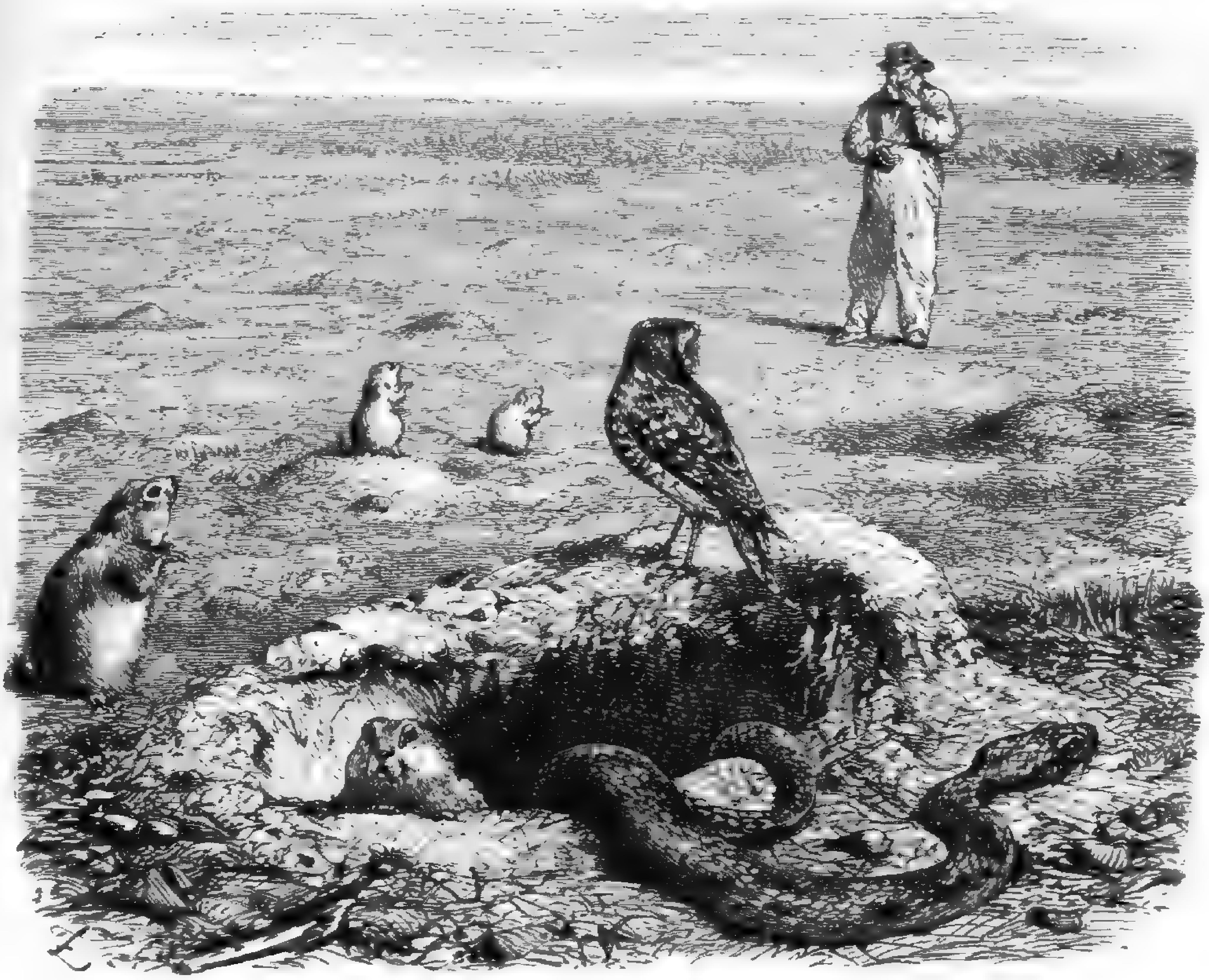
Where wood can be obtained, the fort generally consists of rows of log huts or frame houses, well-built and often made very comfortable, enclosing a central parade ground, with a large building or storehouse; a hospital corresponding to the size of the post; a suttler's store, where usually many things can be bought which are rare luxuries on the plains, but at very high prices; a blacksmith's forge, and other buildings. If the post is so small that an attack on the little community itself is not improbable, a low wall of mud-bricks (adobe), stones, or both combined, is built around it, and one or two six-pounders may not unfrequently lurk behind this breast-work. Otherwise no attempt whatever is made at outer fortifications. If good building-stone can be had close at hand, then the fort becomes a far more durable structure, and considerable pride is often taken by the officer commanding in the designs and construction of the buildings; but if wood is scarce, and there is no good stone near at hand, then the Mexican style of building is resorted to. Bricks are made of mud and straw dried in the sun; and of these all the buildings are constructed. One unaccustomed to this style of architecture would be surprised to see what comfortable houses, and even large buildings, can be made in this way; but as in New Mexico we shall become very familiar with it, there is no need at present to mention it further.

Although the cost of maintaining these posts is enormous, their usefulness is undoubted; but how much better would it be if the evil which necessitates them could be removed? The construction of railroads throughout the country is without doubt the only permanent way of solving the difficulty. As these advance, the forts on the lines of travel, one by one, become useless, while the Indians, after receiving a series of good thrashings from the settlers, soon learn, like the Great Pah-ute nation in California, that their days of successful warfare are over, and that their only chance is to keep quiet, and to allow the Government to feed them.

We left Fort Harker on the morning of the 11th, and, three miles beyond, passed through Ellesworth, a wonderful place, having seven or eight "stores," two hotels, fifty houses of other kinds, occupied by nearly a thousand persons, and yet just one month old. Six weeks ago the wild buffalo was roaming over its site, and the Indians scalped a foolish soldier whom they caught sleeping where the new school-house now stands. The day of the buffalo and Indian have passed for ever; never again will the one graze, or the other utter a war whoop on this spot.

During the two following days we strained our eyes in vain for a glimpse at the big game; their marks were everywhere—tracks, wallows, and skeletons innumerable. We killed many reptiles—the pretty little garter snake, and the long and graceful racer, one of which species measured over six feet; and several of those venomous pests of the plains, the rattlesnake. As a general thing, it is not hard to tell a poisonous snake from a harmless one. The head of the former is covered with large scales, usually five in number, while that of the latter is clothed with small ones, similar to, and continuous with, those covering the neck and body. Again, if you turn the serpent over you will find that, if it is harmless, the succession of semicircular scales which cover the under surface, continue unbroken to the tip of the tail, while at the caudal extremity in the venomous species these ventral scales become divided in two, and continue so to the tip. Several tortoises were seen, and one specimen of the horned toad was captured—a prickly little fellow whom we did not expect to meet quite so far east.

But what most delights all travellers on the plains, at first, are the prairie dogs. These little rodents are the size of a rabbit, the colour of a hare, have the hair of a rat, and the face of a squirrel; but their tails are original, they stand up straight over their back, and do a most enormous amount of wagging. They are the most sociable little fellows in the world; by nature they live in colonies, called by the ranchmen "Prairie-dog-towns," where they often cover many acres of land with their little mounds. Each mound has a hole in the top, leading to the family apartments. They



A Prairie-dog-town and its Inhabitants.

appear to take a most lively interest in "the advance of empire," for wherever there is a road, there they congregate in unusual numbers. In the centre of the main street at Salina, three of these little fellows had established themselves, they seemed to enjoy the bustle of that place, and were the great delight of the children, who used to feed them with nuts and crackers, and get them to sit upon their haunches, and eat with their claws. To frighten or kill one would have brought down the just indignation of the whole neighbourhood. As our line of wagons moved along the road, and approached a "dog-town," the little fellows who were above ground, cropping the grass and playing about, would immediately rush each to his "look-out station" on the top of his mound, while lots of little heads would suddenly appear as those from below came up to see the fun and join in the chorus of sharp barks with which they were wont to greet intruders. They would shake their sides with barking, and at every bark the tails would wag until, worked up to a climax of fear and delight, they would rush into the earth with a volley of half-uttered barks, and a last defiant wag of the little tail. No sooner had we passed than they would appear again, and keep up a chorus of adieus until we were out of hearing. Their flesh is good to eat, being very much like squirrel or chicken; but they are too sharp to be caught away from the top of their mounds, and if shot in this position they always fall into their holes, and die out of reach. The only way to get them is to drown them out by pouring water into their holes, and if the subterranean connections are extensive, or the soil very porous, this cannot be accomplished.

It has been stated by western travellers that the rattlesnake and a small species of owl live in peace with the prairie dog and share his dwelling. I have frequently seen them all in company together, as represented in the sketch, but it is probable that, although the mature prairie dog can protect himself, and has therefore no fear of the intruders, the young are devoured by the latter.

At mid-day, on the 13th, we had just pitched our tents on the banks of the Smoky River when the cry of "antelope!" was raised, and, sure enough, a small herd, frightened by something behind them, ran swiftly by our camp. They immediately received a volley of rifle balls, which produced no other effect than to send them bounding off gracefully across the river. This little excitement was hardly over when buffalo were sighted across the Smoky. There was an immediate rush for the high bluff close by, and away to the left we could plainly see through the glasses six black shaggy fellows languidly chewing the cud, about five miles distant. Three of our party immediately started on foot, notwithstanding the heat of the day and the eighteen miles march just over, for as yet but few of us were mounted, and these only on mules.

From this point, until we reached the Arkansas River, buffalo were a common sight. Before night we had seen several herds roaming about upon the plains, the largest, however, only containing twenty head and some calves. At sunset one of the three hunters came back to announce the success of their chase, and to give notice to the watch that his two companions were following more slowly, heavily laden with choice pieces of the carcass they had killed. As our meat had for some weeks been almost entirely salt, this news was especially agreeable.

We had no sooner found ourselves in the land of the antelope and the buffalo, beyond the little "cities," and out of hearing of the locomotive, than Indian troubles began to cast their shadows around us, deeper and deeper, as we moved forward.

Never before had hostility to the pale-face raged so fiercely in the hearts of the Indians of the plains, and never had so large a combination of tribes, usually at war with each other, been formed to stop the advance of the road-makers. From Dakota to the borders of Texas every tribe, save the Utes, had put on war paint, and had mounted their war steeds. Reports came from the north that the Crows and Blackfoots had made friends with the Sioux, and from the south that the Cheyennes and Arapahoes, the Kiowas and Comanches, had been seen in large bodies crossing the Arkansas, and moving northward. The horrors of the last summer were fresh in the minds of the frontier men, who remembered many a comrade scalped by the red-skins. They laughed at the treaties of the Fall, at General Sherman's councils, and Samborn's wagon-trains laden with gifts. They said, "Wait till the spring, till the frost is out of the ground, and the grass is green and abundant, and then see how the savages will keep their treaties." This season had arrived, and the Indian horizon looked blacker than ever. The Fort Kearny massacre, in which some of the wives of the officers were brutally murdered, and the energetic demands of the railway company on the State had resulted in a considerable military force being sent into Nebraska to protect the road to Salt Lake. This had the effect of driving many additional bands of Indian warriors southward, to harass the poorly-guarded route along the Smoky Hill Fork.

The warriors in many a big talk had sworn to clear their hunting-grounds of the hated intruder. He should no longer drive away their game, or build embankments and put down stakes across their broad lands. So they commenced the fight in their own fashion.

A company, called the "United States Express," carrying the United States mails, had been organised two years before, to run from Denver to the end of the railway advancing along the Smoky Hill River. Stage stations had been built along this route, at distances of from twelve to eighteen miles apart, where the stock of the company was kept, and at which the coaches changed horses. During the winter these coaches ran pretty regularly; but April had scarcely passed before the stages and mail stations became the first though not the only objects of attack. Reports, one by one, came in to us from the West.

On the night of April 30, Goose Creek Station was attacked, he stock carried off, and three mules killed.

On May the 9th, Monument Station, midway between Hayes and Wallace, and Big Timbers Station, were simultaneously ttacked, while a third party tried to burn Chalk Bluff Station. I may add that as Big Timbers, twenty-five miles west of Fort Wallace, had been formerly a favourite Indian burying-ground, it was on that account especially subject to ttack.

Two days after, Pond Creek Station, two miles west of Fort Wallace, was attacked and fired.

On the 18th, the Indians attacked Smoky Spring Station; n the 24th, Big Timbers again; on the 27th, Pond Creek gain, and drove off many head of cattle. The day before they ad attacked the stage-coach, and had commenced the month f June by scalping and horribly mutilating two frontier men n the 3rd, and two more on the 7th, within a few miles of Fort Wallace. These, and many other massacres, took place long the road while we were at Salina; but in so large and hinly-peopled a country, news of a portion of them only could be expected to reach us. The savages even penetrated to within twenty-five miles of Salina, and killed three Germar farmers, who had that spring settled in the valley of th Solomon.

As we advanced, every stage or train from the West (they were however becoming few) told the same tale. On th 12th, the stage horses at Hanshaw's Ranche were drive off; Hugo Wells Station was attacked; and the mules of Mexican train on another part of the road were stampeded.

On Saturday, the 14th, as we neared Fort Hayes, we me the overland mail-coach from Denver: the passengers ha been obliged to fight their way through, and had succeeded in running the gauntlet, with the loss of one soldie killed and one civilian wounded. They had been attacked b twenty-five warriors, on the 11th, near Big Timbers. Hopin that the Indians only desired plunder, they threw some of th baggage from the coach, and then started their horses off at gallop, while the half-dozen soldiers on the roof, who acted a escort, kept up a brisk fire. In this way they reached th next stage station.

The coach was riddled with bullets and spattered wit blood, so that I was not a little surprised at the remark of th "lady" passenger inside, who, in answer to our sympathy said, "She had not been much frightened." I remembere however, that we were in Kansas.

Sunday, the 15th, was passed at Fort Hayes. We foun the garrison nearly all under canvas; for, as I mentione before, the storm of the 7th had completely flooded the mise able collection of log-huts which were known by that nam Here we left our temporary guard of two dozen darke soldiers, and met our regular escort, a company of the 7t United States Cavalry, numbering about fifty, under the com mand of Captain Barnitz, an officer in whose pleasant societ

I have had so many delightful rides, and exciting chases after the buffalo, that I shall long remember him as one of the best of my Western friends.

On the previous Wednesday, General Hancock, Mr. Perry, and one or two more—the remnant of the gay excursion party—had started with an escort to visit Fort Wallace, *en route* for Denver. The general had come out West to see if the Indian depredations were a myth or not (for at Washington, and in the East generally, no one believed the reports), and, if necessary, to devise some effective course of action. During his whole journey, as might have been expected, he neither saw an Indian nor heard a war-whoop, but enough fresh-turned sods and dying soldiers greeted him on his homeward march to convince the greatest sceptic that the Indian war was no idle tale.

Soon after sunrise, our train of wagons moved slowly
June 16. past Fort Hayes. We had gained greatly in strength since our last day's march; the twenty wagons had increased to forty-seven, and the cavalry, which flanked us on the right in the form of a little square, with flag flying gaily in the centre, added immensely to the dignity of our march. The day before I had picked up a very good nag, a chestnut sorrel mare, nearly thorough-bred, whose master had given up all hopes of getting her safely to Denver. I was trying her paces, and wishing for a gallop over the short, elastic sod, when suddenly I spied four fine buffalo throwing themselves along, and bearing straight down upon us as fast as their awkward legs could carry them. Borrowing an additional revolver, I darted off, and found that a rival in the field, who was pressing them hard in the flank, was the original cause of their flight. Singling out the one to the extreme left, a tough old bull, I made straight for him, Colt

in hand, cocked and ready. As soon as he saw a fresh enemy approaching, he stopped, surveyed the position for an instant, jerked his huge head to one side, which seemed to swing his body round, and rushed off in the opposite direction. I was soon alongside, watching his every movement.

What curious freaks of nature these North American buffalo are! The small hind-quarters look out of all proportion to the massive strength of the shoulders and chest; smooth, and apparently shaven, like the back of a French poodle, they do not seem to belong to the same animal. The hind legs are small, and stand close together; the fore legs thick, short, and far apart. Between them the huge head hangs low; it is completely covered with long shaggy hair, matted together, which hides the features, and only allows the tips of the crescent-shaped little horns to appear. Thick hair, for the most part, conceals the hump from sight, but both add immensely to the massive effect of the fore-part of the body: the little corkscrew tail, ends in a tuft. My antagonist kept lashing his naked flanks, while at moments I could see, by the sideward toss of his head, that he was having a look at me, though his eyes were completely hidden by the hair. My first shot, I presume, passed harmlessly over his back; with my second, from the distance of half-a-dozen yards, I planted a ball in his side, but too high up to take immediate effect. He threw himself angrily round for an instant, and off swerved the mare, for she evidently knew her friend and his habits well. He did not charge, however, but made straight for Little Big Creek, which was swollen to a deep torrent by the heavy rains of the previous week. My companion in the chase, who had with his last shot brought down the fat cow he was following, then dashed by, and planted a second ball in the brute's carcass. The ball did not, however, lessen his speed. Just before he dashed into the creek I came up again and gave him his third bullet. The crossing he had chosen was very miry, and too full of timber for our horses, so we entered the stream a little higher up. It was very deep and rapid, and we had some difficulty in swimming across. When we caught up to our buffalo again he was a good deal exhausted, and we could plainly see three little streams of blood trickling down his sleek hide. As escape was hopeless, he became very savage. When I hit him again, he turned deliberately round and charged. He did this three times; but each time his gait was slower, and he threw himself along with greater difficulty. At last he pulled up; we also drew in the reins, but kept close enough to see everything distinctly. He shook his shaggy main two or three times, and lashed his flanks angrily, as he looked around and saw us watching him. He walked a few yards farther, and blood poured from his mouth and nostrils; then he laid quietly down, and rolled over on his back, with his legs thrown up in the air. We sent a bullet, for precaution, through his heart, and in a few moments our knives were out of their sheaths, and our delighted horses were burying their nostrils in his matted mane.

When a large herd of buffalo is encountered, there is little or no danger risked from the animals themselves by riding straight into their midst, for panic seizes them all, and their only thought is flight. But when one of those little herds of from four to a dozen are attacked, which have now in most districts taken the place of the larger herds, these wary old fellows are often found to be very dangerous. Some weeks after the hunt just described, I nearly ruined my mare for the sport by persisting in my efforts to bring down one of these champion buffalo.

Having succeeded in separating her (for she was a cow) from her half-dozen companions, she sternly refused to make any further attempts to escape, and bravely challenged me, although unwounded, to single combat on the open plain. Thrice, when I approached her, she charged down upon me in splendid style; and as I had nothing to aim at but her head, I fired each time straight in her face, which, as might have been expected, proved quite useless. My mare at last was so terrified at such unusual pluck on the part of her opponent, that she became unmanageable, so I confessed myself beaten. The cow was killed a few hours later by some of our party on foot, and they found that one of my bullets had passed through the muscles of the back, parallel with the spine, from the front of the neck almost to the tail. It is well to be cautious in attacking a small herd, for if the horse trips up in a prairie-dog's hole, or the rider is thrown from any other cause during the chase, the buffalo is not unlikely to trample him to death.

CHAPTER IV.

GENERAL FEATURES OF THE COUNTRY FROM SALINA, KANSAS, TO THE ROCKY MOUNTAINS.

Causes which lead to the Scarcity of Trees.—Buffalo-grass and other Grasses.—Wild-flowers very beautiful, a sign of fertility.—Country becomes arid between long. 99° and 100° in Kansas, and this arid tract reaches to the base of the Rocky Mountains.—The Country improves again on reaching the Rocky Mountains.—Pine Forests and Coal Beds.—Will Cultivation increase the Rain-fall?—Camp of Death Hollow.—The Surprise.—More Indian Depredations.—Reach Fort Wallace.

Distance 108 *miles.*

Another week's marching brought us to within a day's journey of Fort Wallace, during which time nothing of special interest occurred. By day we fought the mosquitoes, for the weather had become very warm, especially in the morning until the mid-day breeze had sprung up. By night we kept a vigilant watch, and often transformed a hungry prairie wolf into a hostile Indian creeping through the grass. Midnight alarms were at first decidedly more numerous than red-men.

It is not easy, in a few words, to report fairly on the country through which we passed since leaving Salina. For the first 100 miles there could be no doubt about the fertility of the soils: the loam on the surface was thick and rich, streams were numerous, and there was every indication of a plentiful yearly rain-fall. The scarcity of timber on these plains arises neither from want of water nor poorness of soil, but simply from the difficulties and dangers the young trees in their wild state have to pass through. Prairie fires in the autumn kill them; and the buffalo not only eat the tender shoots, but, while shedding their coats in the spring, pull down quantities of trees along the river banks. Colonel Greenwood, who has up to this point surveyed most of the railroad, complained terribly of these animals knocking down his guide stakes along the track in this way, so that miles of the road had to be re-staked.

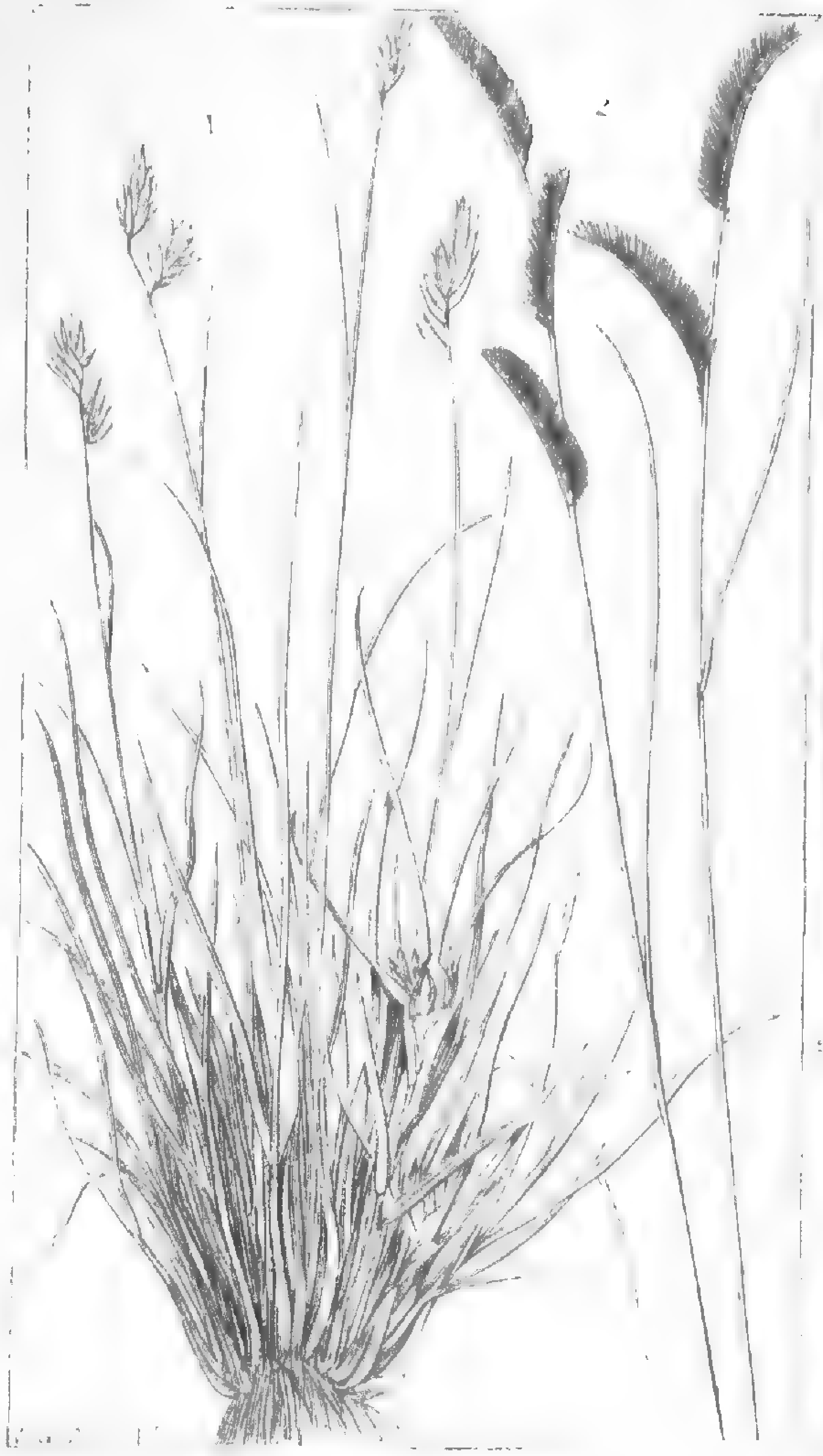
When the young plants can be protected from the fires and the buffalo, there is no doubt but that the settler in this section of country, just as well as on the prairies of Indiana and Illinois, can grow as many trees as he likes, and cover his garden with refreshing shade.

Almost the only tree to be found here is the cotton-wood (*Populus monilifera*), so called from its white downy seeds. It belongs to the same family as the willow and poplar, grows rapidly to a large size, and gives a beautiful shade; but the wood is the worst possible, rotting rapidly if exposed to the weather, and forming a most fertile nest for insects if used for in-door purposes. Close following the cotton-wood from the East, as settlement advances, come the alder and ash; and, some distance behind, may be surely expected the heavier and harder timbers of Missouri. Both the soil and climate are most favourable to the cultivation of peach and fig trees, and also to that of apricots, plums, and cherries; the two latter are found wild in the greatest abundance in many places along the streams.

The short delicate buffalo-grass (*Buchloe dactyloides*, Eng.), beautiful as it is with its bunches of pink stamens, and curious clusters of pistillate flowers, is by no means the most desirable grass, as far as the land is concerned. Its close, thickly-matted fibres keep the ground very dry, by preventing the rain from penetrating into it. I have noticed, times and again, after a sudden thunder shower, how rapidly the rain flowed off into

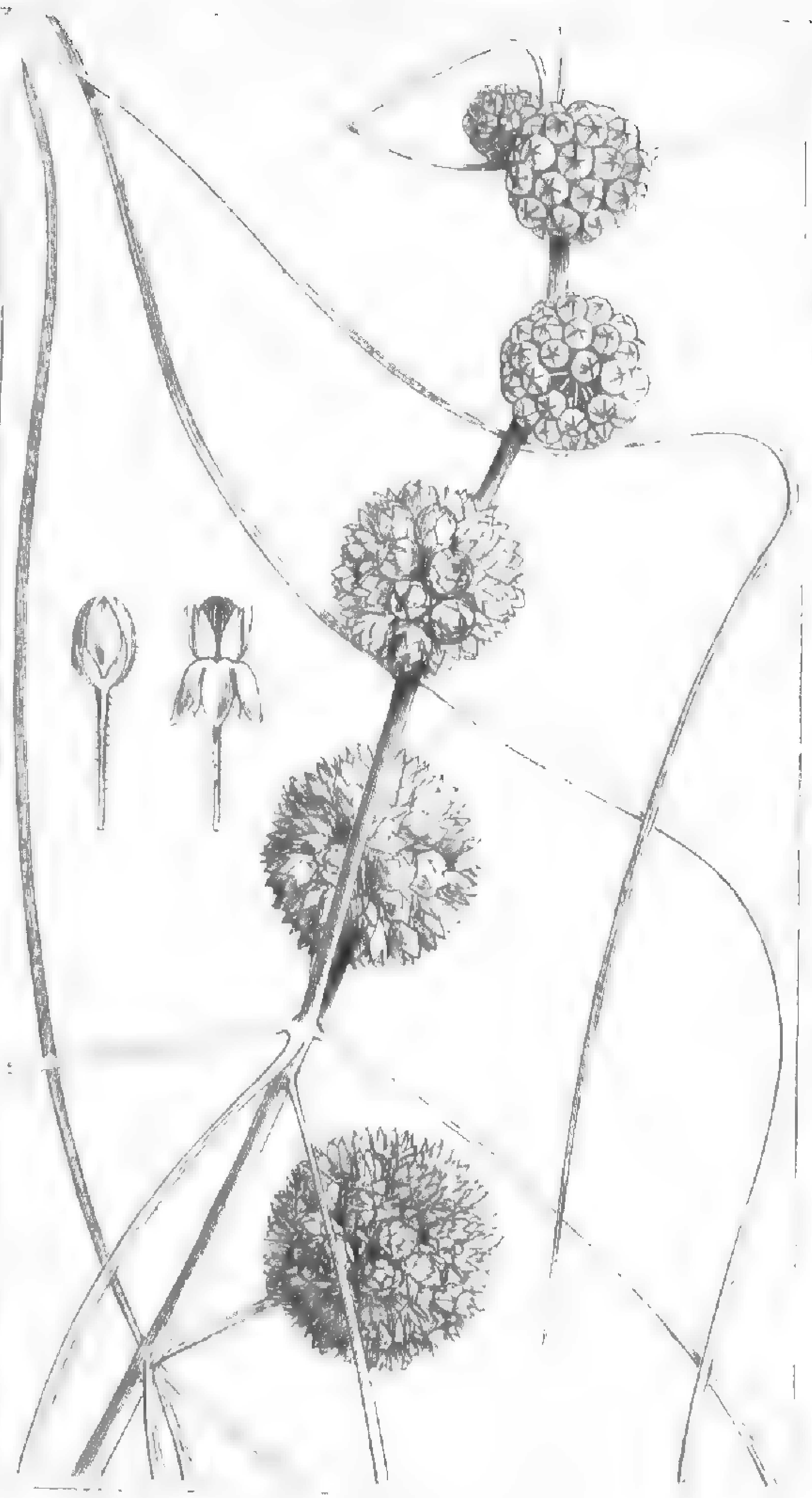
PLATE I.

GRAMINEÆ.



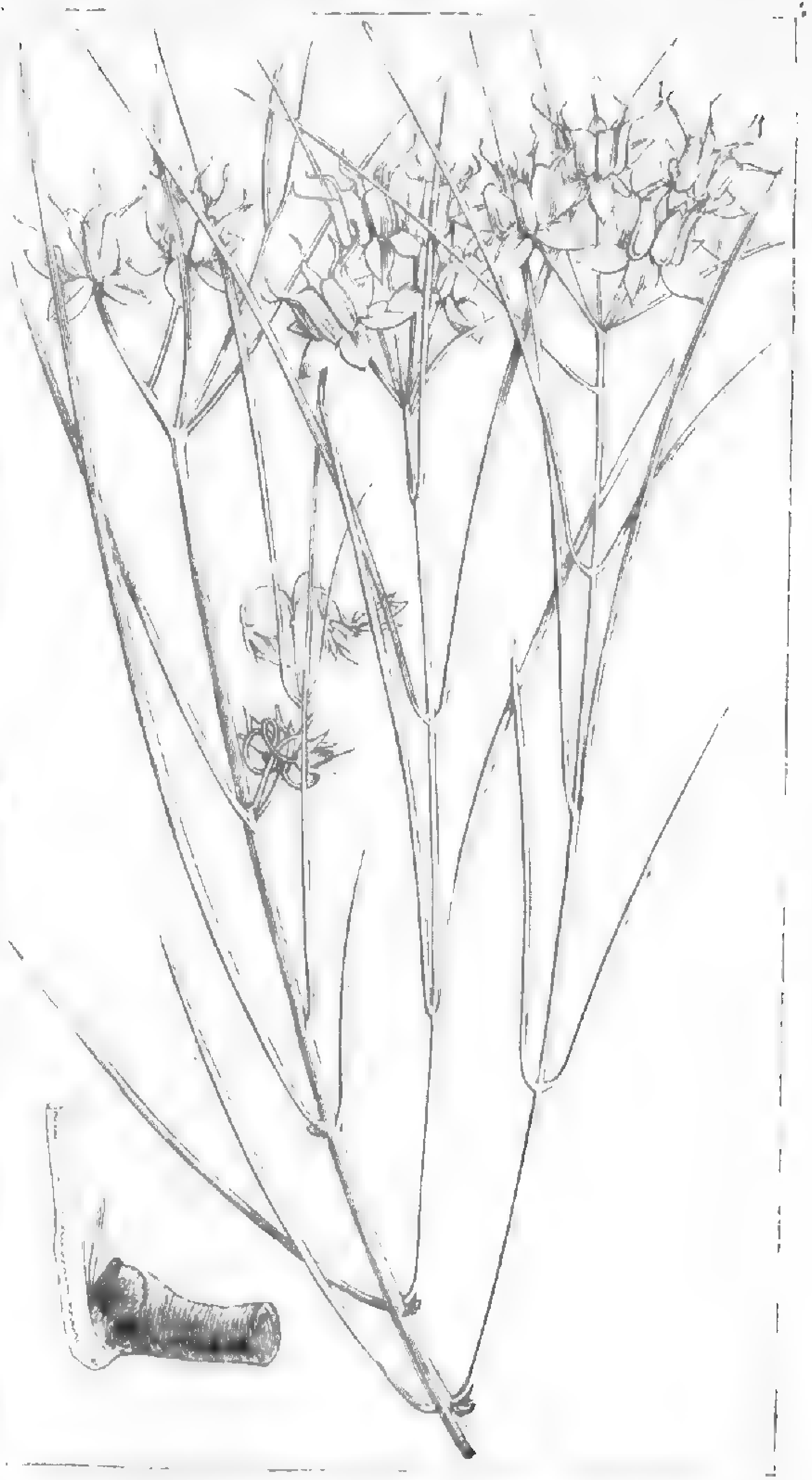
1. Buffalo Grass.
2. Grama Grass.
(Half natural size.)

ASCLEPIADACEÆ.



Acerates auriculata, Engel.
(Half natural size.)
Florets natural size.

ASCLEPIADACEÆ.



Asclepias Macrotis, Bigl.
(Natural size.)

the gullies, filling up the streams, and helping to cause those sudden floods and freshets which so often harassed us on our march. Doubtless no grass could bear so well the heavy tramp of thousands of buffalo continually passing over it; but it is a good thing for the land that, as settlers advance, and domestic herds take the place of the big game, the coarser, more vigorous, and deeper-rooted grasses destroy it, and take its place. These new-comers grow with great luxuriance, yielding very fine hay; and at the same time loosening the sod, opening up the soil, and retaining the moisture in the ground.

Next come the wild flowers. The leguminous plants were very abundant; *Baptisia Australis* was at first the most striking, and remained conspicuous for nearly 100 miles west of Salina; many species of Psoralea appeared as we entered a drier region, and with them the Astragali, so abundant on the steppes of Russia. They frequent the far Western plains in such abundance that I soon collected a dozen different species. The Mallows and Compositæ presented some very gay and striking varieties; amongst the former were *Callirrhoe macrorhiza* and *C. involucrata*, the one an exquisite yellow, the other a rich purple. Penstemona were also very numerous, the most beautiful of six species which I collected being *Penstemon cobœa.*

For miles along the march, perhaps, two or three species would make the whole country gay; then a stranger or two would appear—first few in number, but farther on in greater abundance, until at last they would replace altogether their rivals, and become complete masters of the situation, to be ousted in their turn, twenty miles farther, by other fresh varieties. I remarked, especially, that these wild flowers looked neither stunted nor starved; on the contrary, the species that

I greeted as old friends, were larger and brighter than I had ever before seen them, giving most convincing proof of the fertility of the land.

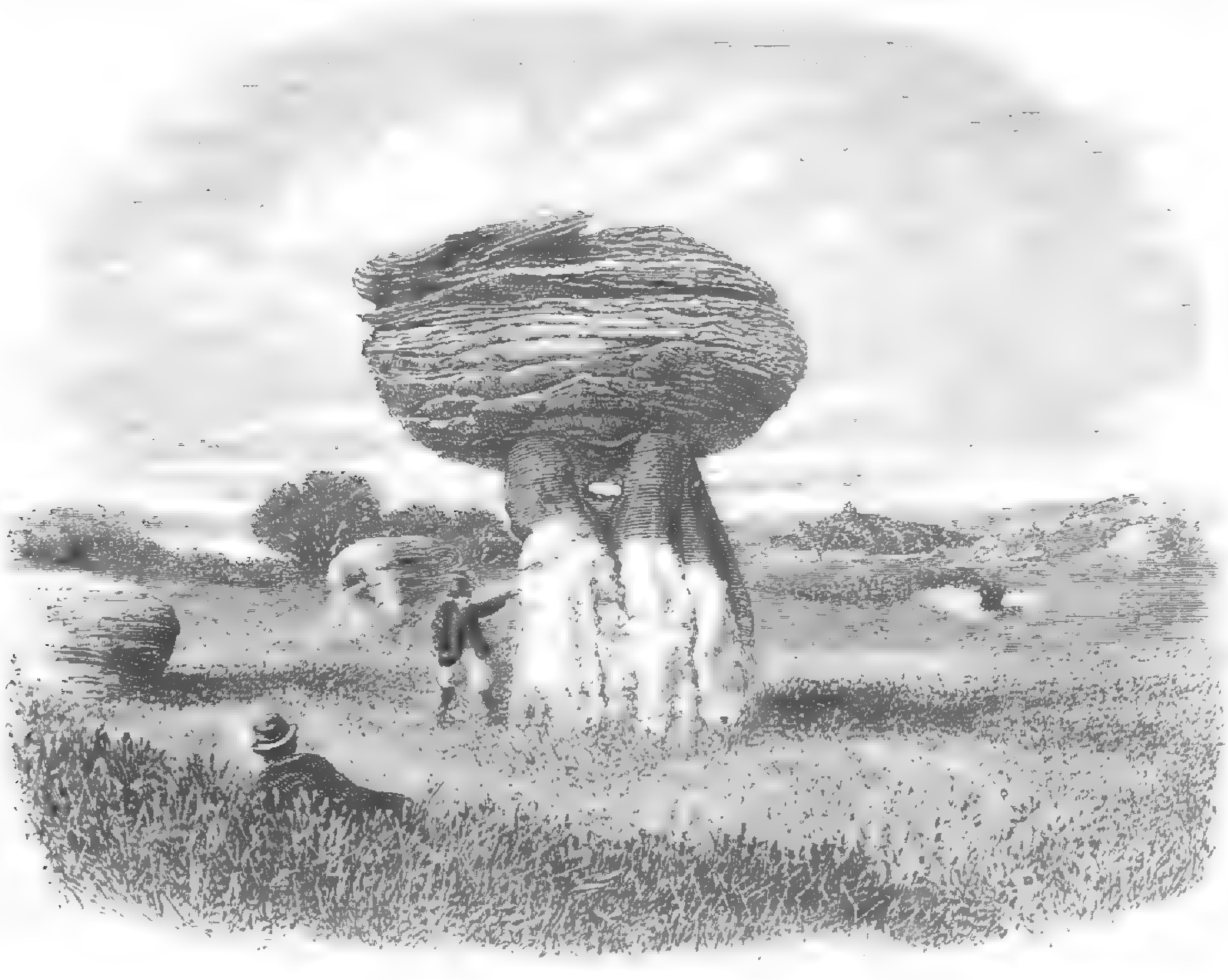
The colours seemed also to follow the same kind of general regularity; at one part all would be white, at another yellow; covering often many square miles, all would be pink, more rarely blue, and sometimes purple.

I think, most assuredly, if we consider even what I have said, there cannot be a doubt that all this region, extending beyond the 99th meridian, and almost to the 100th in Kansas, is susceptible of cultivation throughout without irrigation, and is likely to yield abundant crops and large profits to the farmer.

Not many miles west of Fort Hayes, vegetation begins to suffer from the diminution in the rain-fall, and the general fertility which I have been describing gradually disappears. Streams become less frequent, and dry arroyos take their place. Scrub bushes even are hard to find, and the only fuel to be had during marches of twenty miles or more, is the dry chips of the buffalo dung. Both to the north and south, this line of demarcation exists between the well-watered plains to the eastward, and the more arid regions separating them from the Rocky Mountains. To the north, the line deflects eastward, and to the south it diverges to the west, so that a greater portion of Nebraska is dry and unproductive than of Kansas; while Kansas, taken as a whole, is less fertile throughout than the Indian territory south of it.

There are places where this dry belt is very narrow, and were it absolutely desirable for a trans-continental railroad to avoid it altogether, and to pass all the way to the Rocky Mountains through land capable of continuous cultivation, either with or without irrigation, this might easily be accomplished by leaving the present road at Salina, or Fort Harker, crossing direct to the Arkansas River, following it to New Fort Lyon, and then continuing up the Purgatoire into New Mexico. It is, however, often considered better to make short cuts, than to keep too persistently to the fertile valleys.

Some dozen miles from Fort Hayes, as I have said, we began to enter this impoverished country, and as we advanced day by day, the marks of less frequent rains left their impress on the mineral, as well as on the vegetable kingdom. The country was not so well rounded off into rolling prairie; the bluffs stood out more sharp and bold; and the effects of floods and freshets were more distinctly visible. These are appearances which always increase with the dryness of the region. In a great many instances, the soft, dry land had, in process



Mushroom Rock.

of time, been washed away from the harder foundations, leaving the latter standing on the open plain as grotesque masses of sandstones, marls, &c.

Many of these were named, and formed good land-marks; such were Castle Rock, Monument, Carslile, Hall, Chalk Bluffs (not made of chalk, however), and others all along the route. Their average height above the plain was from 100 to 300 feet.

The most singular of these formations is that met with about six miles east of Fort Harker, and known as Mushroom Rock. The engraving is an exact representation of it.

The worst part of the route was from Donner Station, twenty miles west of Hayes, to within twenty miles of Fort Wallace, a district of about sixty miles across, and even over this sixty miles there was no lack of forage; and in many places very fair grazing could be had, suitable either for sheep or for horned cattle. On nearing the Rocky Mountains the rain-fall gradually increases. Along its eastern spurs it is pretty abundant, producing a good growth of hardy and nutritious grasses, amongst which may be noticed the mountain bunch-grass, as well as the grama (*Boutelorea oligastuchya*), both most excellent for cattle.

Early in March I found the cattle actually fat; they had been out all winter, without shelter or hay, and the frost was still in the ground. I am now speaking of the country between Fort Wallace and Denver, and north of Denver, towards the Black Hills. I may add, however, that the entire belt of country along the spurs of the mountains, especially to the southward, cannot, except in New Mexico, be surpassed by any other region for purposes of sheep farming.

Almost due west of Fort Wallace, a considerable spur from the mountains juts out into the plains. This spur is thickly covered with fine pine timber—a treasure almost beyond price in such a region; and, curious enough, while the timber grows above, a fine bed of coal lies below the surface. This forest is entered about one hundred and eighty miles from Fort Wallace, and extends for at least forty miles up into the mountains.

Whether it is that the timber attracts an additional quantity of moisture, or prevents it from evaporating when deposited, or whether the soil is unusually rich, I know not; but I can say of my own knowledge, that in this district vegetation is very luxuriant, and the country very beautiful. Along the streams flowing from the mountains around Denver and south of it, fine crops and vegetables can be raised by irrigation; but as the altitude of these regions is very great (about 6,000 feet), crops do not flourish much farther north at that elevation. As only a small proportion of these streams on leaving the mountains succeed in crossing the comparatively dry part of the plains, and as the few which do not sink flow for one or two hundred miles with much-diminished volume, I fear that but little irrigation can be obtained from them, and I am decidedly of opinion that, without irrigation, crops cannot at present be raised.

This leads naturally to a very important question. As settlers advance from the East; as they sow corn, plant trees, and open up the soil, will the rain-fall increase to any considerable extent? The knowledge gained from many places in the Western country, where farming on a large scale has already existed for years, leaves no doubt now, that this question can safely be answered in the affirmative. The district around Salt Lake is the most striking example I have met with; here, since cultivation has extensively been carried on, the rain-fall has been nearly doubled, and during months which used always to pass by with cloudless skies, reviving showers are of frequent occurrence, and heavy dews refresh the ground. We may confidently expect, therefore, that the area of arable land on these vast plains will gradually increase, and that the dry belt of country will become narrowed indefinitely, by the skill and industry of the husbandman.

June 23.

At sunset, on this Sunday evening, unusual activity might have been seen in our camp. We had crossed the Smoky Hill Fork for the last time, and had pitched our tents on its banks, in a spot known as Death Hollow. The name was not a prepossessing one, but so many trains had been attacked there, and so much life had been taken on that piece of bottom-land, that it was, at all events, appropriate. Trains which camped there, it was said, were sure to be attacked; there were, however, three most tempting inducements to remain—abundance of wood, water, and grass.

On one side were the bluffs, which abruptly separated the depressed valley from the general level of the plain. On the other flowed the stream, its banks clothed with willow, cotton-wood trees, and tall rank grass; beyond were the bluffs of the opposite side, lying pretty close to the river. About a mile farther up the stream, on a carpet of the greenest grass, beneath a cluster of large cotton-wood trees, the bleached skeletons of a great many buffalo lay altogether, showing that this place had been a favourite camping-ground for Indian hunting parties.

At seven o'clock we were roused from our languid enjoyment of the cool evening breeze and the glorious sunset, by two or three shots fired in quick succession from the plains, and one return shot from our sentinel on the bluffs, who ran directly into camp crying "Indians! Indians!" In a moment we were ready, with our Spencer carbines in our hands; but we heard no war-whoop—saw no enemy. Two large objects, however, quickly came in view, which soon developed into two stage-coaches, covered outside with soldiers and their rifles. These soldiers had mistaken our men on the bluffs for Indians, and had fired at them, at which our escort, who were mostly recruits and unaccustomed to being made targets of, thought that their end had come, and that the Indians were upon them "sure."

Not much was said about the mistake, for both sides were a little ashamed of it, and our great desire was to hear the news. It was the old story, but rather worse than usual. Nearly a week before, the coaches had left Fort Wallace, and had tried to run the gauntlet together to Denver. On the 17th, however, before they had travelled more than thirty miles, they were attacked by a band of 200 warriors, all mounted and well armed. Unable to go farther, they tried to retrace their steps, and had a running fight with the Indians for eight miles, when the savages, after losing several comrades, gave up the chase. Two soldiers and one civilian were killed, and their bodies left on the road; two of the guards were wounded, and Mr. Blake, of Philadelphia, who had come out with the excursion party, and was on his way to Denver, had been shot in the shoulder. He was sufficiently recovered, however, to leave Fort Wallace that afternoon, and commence his homeward journey. From him we received a description of the fight. The stages had started eastward two days previously, and been driven back to the fort; but with indomitable perseverance, they had tried again, and this time successfully.

That night we dug rifle pits around our camp; and long shall I remember discussing with my companion of the watch as we sat together in one of them, whether a light that appeared suddenly over the opposite bluff was an Indian signal or only a star. The coyotes howled dismally all through the night, and at daybreak joined in a chorus of such unearthly yells, that some of the knowing ones in Indian warfare declared that these coyotes had no tails, but faces like red-men, and teeth made of lead.

Next day we entered Fort Wallace, and found the little garrison quite worn out by the dangers and anxieties of the last few days. I shall, however, leave it to my friend, Major Calhoun, who had previously arrived with General Hancock and his staff, to recount what had transpired before our arrival, in a fresh chapter.

The Major and I became great friends at Fort Wallace; although my junior in years, he looked a middle-aged man, for he had gone through hardships during the civil war which few men could have survived. He had been shot through the lungs, had lost a leg, and had been thrice taken prisoner; worse than all, he had lingered for eighteen months in the dungeons of a Southern prison. Twice he tried to escape across the swamps of the Chickahominy, and twice he was recaptured and brought back to expiate that offence by greater sufferings and more acute starvation. At last he succeeded, shoeless and in rags, in breaking through the lines and reaching the Northern piquets in safety, where he learned that he had already been exchanged. The bracing climate of the Rocky Mountains did wonders for him, and soon he was able to go through as much fatigue as the strongest amongst us.

CHAPTER V.

A FORTNIGHT AT FORT WALLACE.

General Hancock arrives at Fort Wallace, June 16.—First Indian Assault on the Fort, June 21.—Attack on the Quarries.—The Garrison worn out.—A quiet Sunday.—False Alarm.—Arrival of General Wright and party, June 24.—The Mail-bags.—Second Indian Attack, 25th.—The Fight.—The Mutilated Dead.—Wonderful Recoveries.—Pond Creek Station.—Detained a Fortnight at Fort Wallace.—General Hancock returns from Denver.—He cannot give us any more men.—Proceed in company with Colonel Greenwood and Party.

Fort Wallace.

"At sunrise on Sunday, the 16th, General Hancock and escort broke camp fourteen miles north-east of Fort Wallace.

"Winding down from the dividing ridge, about 9 A.M., a cheer came from the head of the column. Riding out, I saw in the distance the white tents and long reddish buildings of Fort Wallace. Glad, indeed, were we to see human habitations; and in the bright sunlight Fort Wallace looked like a beautiful little village, nestling on the far-off hill-side. We passed large beds of flowering cacti on our way down, and the lower ground appeared to be one mass of waving flowers. Though the fort seemed to be but a very few miles off, we really found it seven, so clear is the atmosphere in this region. About 600 yards from Fort Wallace we went into camp, and soon all were busy in washing themselves, and donning apparel more befitting the Sabbath-day and rest. We had been in camp but a short time, when Captain Kehoe, of the 7th Cavalry, the commandant of the post, Adjutant Hale, Lieutenant Bell, and other officers, came down to welcome us. Fort Wallace is situated on Pond Creek, the south branch of

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the Smoky Hill River, and about ten miles south-west of the present terminus of the Kansas Pacific Railroad. It was called after General Wallace, and is two miles from the present Pond Creek Station. There is accommodation here for 500 men; but, owing to the constant Indian depredations, the troops that should be at the fort are scattered in small parties over the roads between Fort Hayes and Denver, vainly trying to protect the overland stages from the attacks of the savages.

"Colonel Greenwood, his little party of twenty engineers, and a small escort of twenty-five coloured troops, had just completed the survey for the railroad up to this point. Their destination was Denver, 200 miles distant, to which town they intended making a preliminary survey for a branch line; but the Sioux and Cheyennes had harassed them so much that they were obliged at last, after losing thirteen mules, to come into the fort to refit, and to obtain, if possible, a stronger escort.

"On the Friday after our arrival General Hancock started for Denver. The people there were in great distress, and were calling out loudly for help; provisions were becoming scarce, prices enormous, and trade almost at a stand-still; for communication with the East had been almost entirely stopped by the Indians. Wagon trains had ceased either to arrive or to leave, and the mining population in the adjoining districts, dependent entirely upon supplies from the East, were even in a worse condition than the traders of Denver.

"Captain Kehoe, and far more troops than could well be spared from Fort Wallace, accompanied the General, leaving behind only about fifty fighting men, as many civilians, and Colonel Greenwood's little escort of twenty-five coloured troops, to guard the post. Such was the state of affairs when, on the next morning (Saturday 22nd), in company with Lieutenant Beecher (post quarter-master) and four cavalry men, I went down to Colonel Greenwood's party, who were making a survey of the Government reservation around Fort Wallace. On our way back we ascended a hill which brought us in full view of the fort; there we saw men rushing across the plain in apparent excitement, and just beyond, a large number of mounted warriors were dashing back and forth on their horses. This was accompanied by the rattle of musketry. With a cry of 'Indians!' Beecher galloped on, and it did not take us many minutes to come within rifle-shot of the 400 Indians who were encircling the fort.

"I was mounted on Lieutenant Bell's horse, but he met me outside the fort, and, on my dismounting, jumped into the saddle, and galloped directly for the enemy, which a small body of twelve cavalry men was holding in check. I secured the horse of a wounded man, and, anxious to see how the 'noble red-men' fought, I rode to the front. Here I found a number of wounded men, and an irregular line of soldiers and civilians on foot; while the mounted men, under Lieutenant Bell, were in the advance, skirmishing with the Indians. On the left of the little line of battle, a body of some fifty Indians rushed forward just as Sergeant Dummell, with ten men, appeared over the hill from the fort. Shouting to his men, three of whom followed him, the gallant fellow plunged in amongst the Indians; and for a few minutes the yells of the savages, the rattle of 'Spencers,' and the encouraging shout of the young sergeant, could be heard. Before assistance could reach them, the Indians were reinforced, and the devoted little band were trampled under the feet of the Indian horses. After the soldiers had fallen, the brutal Indians fired on them, and speared them. They were about scalping them, when the remainder of our little force rushed to the rescue, and the red-men fell back, carrying with them their own dead and wounded, and the horses and equipments of Dummell's men. All the fallen men were recovered, with one exception. This poor man's body lay hidden for some minutes by an undulation in the plain; but on being discovered by a civilian, a rush was immediately made towards the corpse. It was safely secured before the savages had succeeded in taking the scalp, and carried to an ambulance which had been sent out for the wounded.

"Fearing an attack directly on the fort, Adjutant Hale called in all the men on foot and posted them, so as to be ready in case the Indians made an united assault. The latter showed a great deal of their accustomed bravado. For instance, a band of ten or twenty rushed out of their irregular line, brandishing their spears, and whooping all the time; then, wheeling rapidly, they fired, and ran back to their comrades, while our carbiniers made the atmosphere very hot about their ears.

"Lieutenant Bell was well mounted, and riding close to the Indians to ascertain their force, a man on a white horse galloped out of the line, as if to court combat. Bell, however, kept on, at which the Indian jerked in his horse, fired, and galloped back. This man led on the Indians in their first rush. He is believed to be a half-breed, son of Colonel Brent, by a Cheyenne wife. He is twenty-four years of age, and disowned by his father. He shows his affection for him by swearing he will shoot him at the first opportunity, and wear his father's scalp in his belt.

"I was somewhat surprised to see the regularity of the Indian advance when they made their last dash. Leaving their main body dismounted in line, 'standing to horse,' thirty were moved forward, and deployed as skirmishers, at distances of two paces. But after coming within range of our carbines, they changed their minds and returned.

"I must say I felt glad when I saw Colonel Greenwood's coloured troops forming to the rear, though their advent nearly resulted in my own death. I was galloping towards the ground upon which the black men were posted, when I heard a whiz! whiz! whiz! close to my ears, and looking up, I saw the sergeant taking aim at my head. He was close to me, and I mildly insinuated that his conduct was not at all pleasant. He replied, 'Gosh! I was gwine for yeh—thought yeh was an Ingin, shuah!' I need not assure you that I did not take the negro's remarks in a complimentary sense, and I particularly objected to his manner of presenting them. When I returned to camp, I borrowed a glass; and as I saw my long black hair, brown silk shirt, brigandish cavalry hat (Captain Kehoe's), and generally demoralised appearance, I changed my mind about going down to Greenwood's camp to 'demand an explanation.' Even my mother might have made the same mistake.

"About three miles from Fort Wallace, and at the foot of a long range of hills which partly surround it, are situated the quarries from which the stone is procured for the buildings now being erected. Six teams are employed in hauling the stone, and some thirty men in getting it out. The labourers have tents, and remain at the quarry.

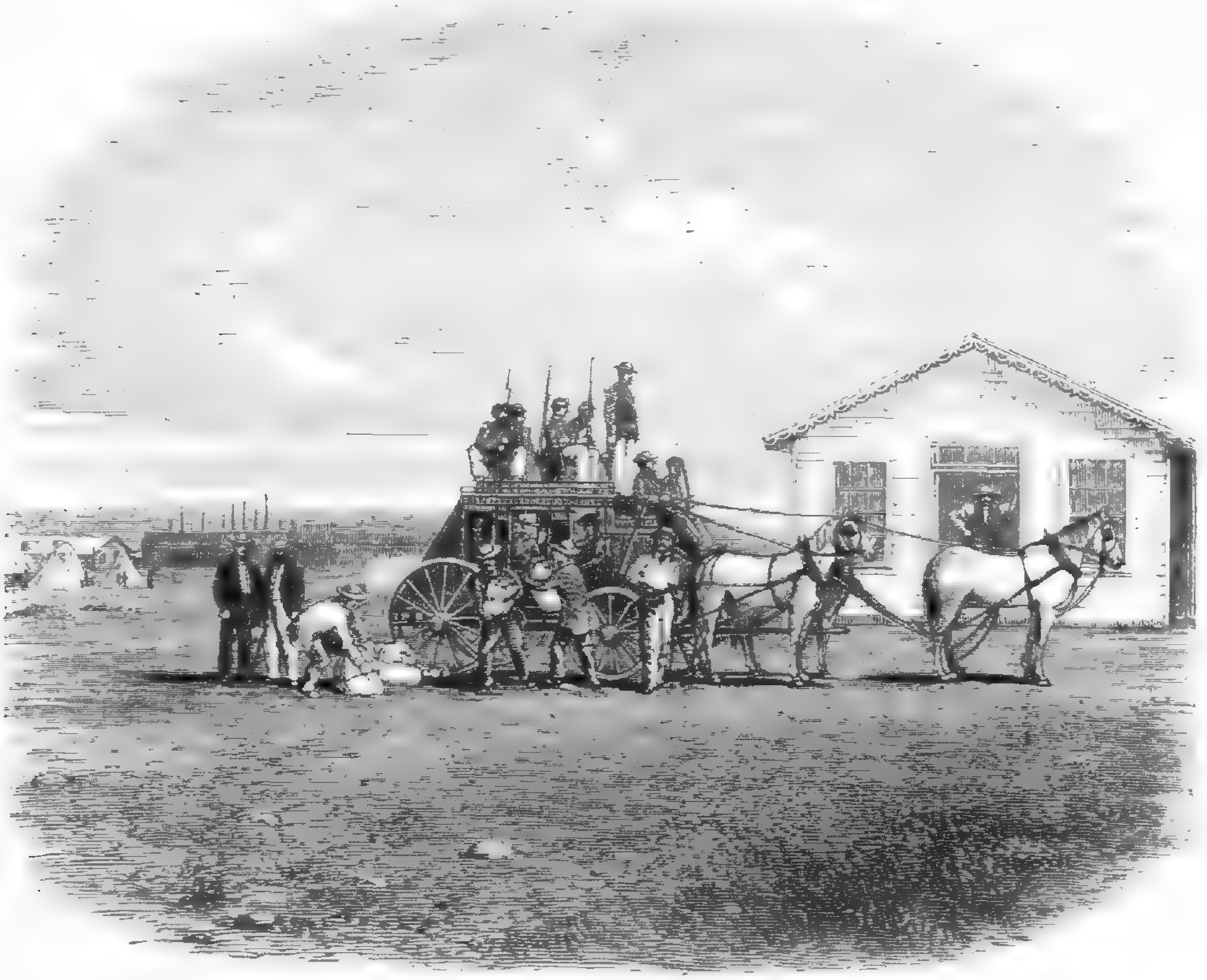
"Simultaneously with the Indians' appearance in front of the fort, a large body made a dash at the teams, two of which were near the quarry. One succeeded in getting in; but the other, in full view of all, was overpowered, and the driver, Patrick McCarty, cut down. It was astonishing to see the rapidity with which the Indians cut loose the mules and ran them off, after which they upset the wagon. Owing to the fire kept up by the men in the quarries, they did not scalp the teamster. Seeing a movement on the part of the men in the quarries to evacuate, our little handful of mounted men galloped over to head off a body of Indians who were riding for the labourers. In this we were successful; but the quarries had scarcely been evacuated ten minutes before the Sioux and Cheyennes had taken possession of them, and set the works and huts on fire. Our loss that day was eight men—four killed and four wounded—the latter, I regret to say, severely.

"There was but little sleeping in Fort Wallace on Saturday night. Every man was needed, and there was an air of determination about the men which led me to believe that if the Indians assaulted the fort that night, their success would be purchased at a terrible price. Every man was armed. Lieutenant Lea, stationed here temporarily, was very active, and did much towards giving the men confidence.

"A calm Sunday followed the storm. We buried the poor fellows that had been killed the day before in the little graveyard, by the side of their comrades, not one of whom had died a natural death.

"There was no rest, however, for the little garrison, nearly broken down with arduous guard and picket-duty. Every hour the horizon was closely scanned; not a tall tuft of grass moved in the distance, not an antelope bounded over the plain, that was not noticed by the sentinel.

"The next night passed quietly by, and no fresh attack was made. At 10 o'clock in the morning, however, a column of dust was seen rising seven miles off to the eastward. That was the direction the Indians had taken. They might be returning to renew the fight. So, quicker than it takes to tell it, the little band stood ready with arms for an enemy and hands for a friend. The column of dust approached. Then a long line came over the hill, four miles distant. The bright sun shone on the white covers of the wagons, and was reflected from the shining barrels and glittering scabbards of the advancing cavalry. No Indians ever approached in that slow, solid step. So a thrill of pleasure ran through all as Adjutant Hale, from 'the look-out,' on the roof of the sutler's 'store,' announced the approach of General Wright and his surveying party, with a large cavalry escort."



Arrival of the Mails at Fort Wallace.

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While friends were clasping hands in warm welcome and overflowing with questions, a second pleasure was in store for us all. Scarcely were the tents pitched and the mules let loose to roll on the grass and play in the serio-comical manner peculiar to the race, when two coaches from the East brought us the first mails we had received since starting. The bags were carried into the little mail-room, and their contents emptied out upon the floor. Most of us found our names amongst the pile. How sweet the news from far-off Philadelphia and dear old England none can appreciate who have not felt it for themselves. So all went merrily on through the day. The officers were most hospitable; we spent the evening at their quarters, and retired to our tents thoroughly contented with ourselves and at peace with all men.

Peace did not last long, however, for early dawn brought the red-skins back again. They were evidently ignorant of the fresh reinforcement, and came determined this time to take the fort and repeat in all its horrors the Fort Kearney massacre. Pond Creek Station was the first point of attack; but, as usual, this little fortress—for in fact it was quite a stronghold in its way—proved too much for them. They succeeded in stampeding four of the stage-horses; and almost the first intimation received at the fort of an attack was brought by these horses galloping straight towards us, two-and-two, exactly in the same order as they were accustomed to be driven. One was bleeding from a wound in the hind leg, another had been shot in the neck. The Indians followed on their horses, whooping and yelling like a host of demons. Without a moment's delay, a dozen cavalry from the fort, united with some thirty-five of our escort, and led by our officer, Captain Barnitz, were in the saddle. The bugle sounded, and out they went across the open plain.

The Buffalo Indians are probably the finest horsemen in the world. Accustomed from their childhood to chase the buffalo, they live half their time in the saddle. No reins are used to guide their horses, but they press with their heels on whichever side they want to turn. Both hands and arms are consequently free to use the rifle, the bow, or the spear at pleasure. These men were splendidly armed with rifles for long ranges, bows and arrows for short distances, and spears and tomahawks for hand-to-hand combat. They were tightly strapped to their saddles, so that they could bend down at either side of the horse, and completely hide their bodies from view as well as from the bullets of the enemy; and when shot they did not fall to the ground, but were carried off the field by their ponies, unless the latter were disabled also.

Leading on the red-skins could distinctly be seen the tall warrior with the long lance on the white horse, who was so conspicuous in the fight of Saturday. As the little column advanced, the Indians commenced signalling by walking their horses in a circle, while the chief made signs to some warriors out of view by means of a shining instrument or mirror, which flashed brilliantly in the sun. The savages had evidently not expected to find so large a body ready to meet them, or to see an additional line of tents and wagons added to the fort. All this signalling seemed to result in the gradual withdrawal of the attacking party from the immediate vicinity of the fort behind a ridge some two miles distant, where, as it turned out, a much larger number were waiting in concealment. At the first cry of "Indians!" we were all out of our tents, rifle in hand. My friend, Walter Hinchman, Criley, our carpenter, and myself, started immediately for a ravine about two miles off on the right, which formed a covered approach of six miles or more in length leading in the direction of our camp. General Wright very wisely detained the rest of the party in camp to defend it in case of attack while the cavalry were away. Finding no Indians advancing along the ravine, we returned to breakfast, feeling it undesirable to go farther unprotected and alone. Two hours of great suspense followed, which was not much relieved by the appearance of a horseman from the field of action, who came to get an ambulance for the dead and wounded.

The following is an account of this engagement:—

No sooner had the cavalry followed the retiring band beyond the ridge, exchanging shots and skirmishing all the way, than on either flank two fresh bodies of warriors suddenly appeared. They halted for a few minutes; a powerful-looking warrior, fancifully dressed, galloped along their front shouting out directions; and then, like a whirlwind, with lances poised and arrows on the string, they rushed on the little band of fifty soldiers. The skirmishers fired and fell back on the line, and in an instant the Indians were amongst them. Now the tide was turned. Saddles were emptied, and the soldiers forced back over the ground towards the fort. The bugler fell, pierced by five arrows, and was instantly seized by a powerful warrior, who, stooping down from his horse, hauled him up before him, coolly stripped the body, and then, smashing the head of his naked victim with his tomahawk, threw him on the ground under his horse's feet. On the left of our line the Indians pressed heavily, cutting off five men, among them Sergeant Frederick Wylyams. With his little force, this poor fellow held out nobly till his horse was killed, and one by one the soldiers fell, selling their lives dearly. The warrior who appeared to lead the band was, up to this time, very conspicuous in the fight, dashing back and forth on his grey horse, and by his actions setting an example to his warriors. In the *mêlée*, however, one of our cavalry men was thrown to the ground by the fierceness of the Indian onslaught, when this leader, who I have since learned was the famous Cheyenne war-chief Roman-nose, attacked the prostrate man with his spear. Corporal Harris, of "G" company, was near him, and struck Roman-nose with the sabre which he held in his left hand. Quick as thought, the chief turned on him; but as he did so, the faithful "Spencer" of the corporal met his breast, and with the blood pouring from his mouth, Roman-nose fell forward on his horse, never again to lead his "dog-soldiers" on the war-path. By this time it was more than evident that on horseback the soldiers were no match for the red-skins. Most of them had never been opposed to Indians before; many were raw recruits; and their horses became so dreadfully frightened at the yells and the smell of the savages as to be quite unmanageable. So Captain Barnitz gave the order to dismount.

When the dismounted cavalry commenced to pour a well-directed volley from their Spencers, the Indians for the first time wavered, and began to retire. For two hours Captain Barnitz waited with his thinned ranks for another advance of the Indians, but they prudently held back; and, after a prolonged consultation, retired slowly with their dead and wounded beyond the hills, to paint their faces black, and lament the death of one of the bravest leaders of their inhuman race.

I have seen in days gone by sights horrible and gory—death in all its forms of agony and distortion—but never did I feel the sickening sensation, the giddy, fainting feeling that came over me when I saw our dead, dying and wounded after this Indian fight. A handful of men, to be sure, but with enough wounds upon them to have slain a company, if evenly distributed. The bugler was stripped naked, and five arrows driven through him, while his skull was literally smashed to atoms. Another soldier was shot with four bullets and three arrows, his scalp was torn off, and his brains knocked out. A third was riddled with balls and arrows; but they did not succeed in getting his scalp, although, like the other two, he was stripped naked. James Douglas, a Scotchman, was shot through the body with arrows, and his left arm was hacked to pieces. He was a brave fellow, and breathed out his life in the arms of his comrades. Another man, named Welsh, was killed, but all subsequent search failed to discover his remains. Sergeant Wylyams lay dead beside his horse; and as the fearful picture first met my gaze, I was horror-stricken. Horse and rider were stripped bare of trapping and clothes, while around them the trampled, blood-stained ground showed the desperation of the struggle.

I shall minutely describe this horrid sight, not for the sake of creating a sensation, but because it is characteristic of a mode of warfare soon—thank God!—to be abolished; and because the mutilations have, as we shall presently see, most of them some meaning, apart from brutality and a desire to inspire fear.

A portion of the sergeant's scalp lay near him, but the greater part was gone; through his head a rifle-ball had passed, and a blow from the tomahawk had laid his brain open above his left eye; the nose was slit up, and his throat was cut from ear to ear; seven arrows were standing in different parts of his naked body; the breast was laid open, so as to expose the heart; and the arm, that had doubtless done its work against the red-skins, was hacked to the bone;

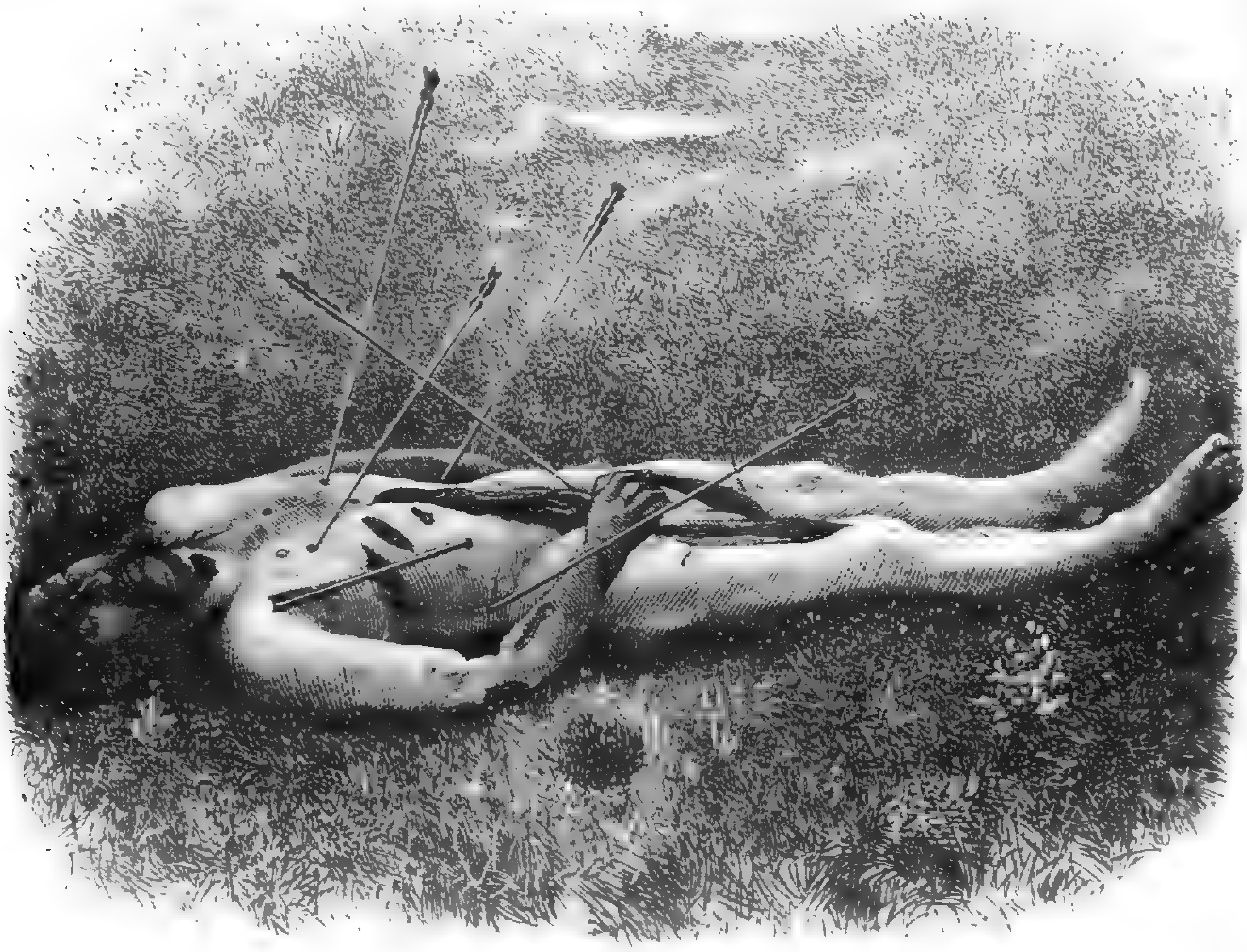
his legs, from the hip to the knee, lay open with horrible gashes, and from the knee to the foot they had cut the flesh with their knives. Thus mutilated, Wylyams lay beside the mangled horse. In all, there were seven killed and five wounded.

As I have said, almost all the different tribes on the plains had united their forces against us, and each of these tribes has a different sign by which it is known.

The sign of the *Cheyenne*, or "Cut arm," is made in peace by drawing the hand across the arm, to imitate cutting it with a knife; that of the *Arapahoe*, or "Smeller tribe," by seizing the nose with the thumb and fore-finger; of the *Sioux*, or "Cut-throat," by drawing the hand across the throat. The *Comanche*, or "Snake Indian," waves his hand and arm, in imitation of the crawling of a snake; the *Crow* imitates with his hands the flapping of wings; the *Pawnee*, or "Wolf Indian," places two fingers erect on each side of his head, to represent pointed ears; the *Blackfoot* touches the heel, and then the toe, of the right foot; and the *Kiowa's* most usual sign is to imitate the act of drinking.

If we now turn to the body of poor Sergeant Wylyams, we shall have no difficulty in recognising some meaning in the wounds. The muscles of the right arm, hacked to the bone, speak of the Cheyennes, or "Cut arms;" the nose slit denotes the "Smeller tribe," or Arapahoes; and the throat cut bears witness that the Sioux were also present. There were, therefore, amongst the warriors Cheyennes, Arapahoes, and Sioux. It was not till some time afterwards that I knew positively what these signs meant, and I have not yet discovered what tribe was indicated by the incisions down the thighs, and the laceration of the calves of the legs, in oblique parallel gashes. The arrows also varied in make and colour, according to the tribe; and it was evident, from the number of different devices, that warriors from several tribes had each purposely left one in the dead man's body.

I had made the acquaintance of poor Sergeant Wylyams only the day before. He was an Englishman, educated at Eton, and of good family, but while sowing his wild oats, he had made a fatal alliance in London, and gone to grief. Disowned by his family, he had emigrated to America, joined the army, and was daily expecting promotion out of the ranks.



The Mutilated Sergeant.

The day on which he was killed he had promised to help me in printing off some copies of the photographs which I had taken on the way. I had to print off my negatives alone, and to take a photograph of him, poor fellow, as he lay; a copy of which I sent to Washington, that the authorities should see for themselves how their soldiers were treated on the plains.

These Indian troubles detained our party nearly a fortnight in idleness at Fort Wallace. The hospital tents were crowded, and I must say that I never saw better surgery or more careful management than here, under the hands of Dr. Turner, the medical officer of the post. Two cases he was especially proud of, and certainly with reason. One was a Mexican, the other a soldier; both had been shot through the body, by an arrow. They both recovered without a bad symptom. The soldier I watched from the extraction of the arrow until he was able to walk about. The arrow had entered the back two inches from the spine, and the point had reappeared just below, and about two inches from, the navel. It had, probably, passed quite through the liver, without touching any other organ; still, four layers of peritoneum must have been pierced, and the recoveries, in both cases, say as much for the healthiness of the climate as for the skill of the surgeon.

General Wright did not think it advisable to leave Fort Wallace with so small a force to guard it. His chief reason, however, for remaining, was the hope of obtaining a larger escort for himself on General Hancock's return from the West. As, however, we were splendidly armed, had abundance of ammunition, and were supplied by the Government with every necessary in order that the Indians should not succeed in stopping or delaying us, this inactivity was by no means popular with the majority of the party.

One day I examined Pond Creek Station, and as it is a very good specimen of one of those fortified stage stations which are to be found along the overland routes, a short description may not be uninteresting.

Standing side by side, and built of wood and stone, are the stables and the ranche in which the drivers and the ostlers live. Behind is a coralle, or yard, divided off from the plain by a wall of stones. In this is kept the hay, &c., belonging to the station. A little subterranean passage, about five feet by three, leads from the stables to the house. Another one leads from the stables to a pit dug in the ground, about ten yards distant. This pit is about eight or ten feet square, is roofed with stone supported on wood, and just on a level with the ground portholes open on all sides. The roof is raised but little above the general level of the ground; more, however, at this station than at most of them. Another narrow subterraneous passage leads from the house to a second pit, commanding the other side of the station; while a third passage runs from the coralle to a larger pit, commanding the rear. In both houses, many repeating Spencer and Henry breech-loading rifles—the former carrying seven, and the latter eighteen charges—lie loaded and ready to hand; while over each little fort a black flag waves, which the red-men know well means "no quarter" for them. When attacked, the men creep into these pits, and, thus protected, keep up a tremendous fire through the portholes. Two or three men, with a couple of breech-loaders each, are a match for almost any number of assailants. I cannot say how many times these little forts have been used since their construction, but during the three weeks we were in the neighbourhood, the station was attacked twice. The Indians are beginning to understand these covered rifle-pits, and the more they know of them the more careful they are to keep at a respectful distance from them.

At the close of the following week General Hancock arrived. He had left so many of his escort here and there along the road, that no additional troops could be spared for us; and our expedition might have ignominiously returned at its outset, had not Colonel Greenwood most liberally offered to escort us with his surveying party and his coloured troops—making, in all, nearly fifty additional men—across the remainder of the country considered unsafe.

CHAPTER VI.

CROSSING THE DESERT BETWEEN THE SMOKY HILL FORK AND THE ARKANSAS RIVER.

Leave Fort Wallace.—How the Surveyors "Run a Line" on the Plains.—First Night.—Second Day, find Buffalo and Water.—Third Day, Twenty-three Miles of "Line" surveyed.—No Water, Sufferings of the Animals.—Miseries of a Dry Camp.—Reach the Valley of the Arkansas.—Excitement of the Horses and Mules on reaching the Water on the Fourth Day.—The Valley, Fertile but Uninhabited.—We follow the Stream for Forty-two Miles to New Fort Lyon.—Ruined Forts passed *en route*.—Reach New Fort Lyon, July 14th.—The Building Stone.—First Glimpse of the Rocky Mountains.—A Hunting Party arrive.—Threatened with Cholera.—Spread of the Epidemic over the Plains.

Distance travelled 114 *miles.*

The country between Fort Wallace and the Arkansas River was very little known; no road traversed it, and no one ever crossed it but the hunter and trapper, and they but rarely. It was thought to consist of an undulating plain covered with buffalo grass, and to be almost entirely destitute of water. The best maps of that section of country had placed one stream, "Sand Creek," between the head waters of the Smoky Hill Fork and the Arkansas River; but this was reported to be only an arroyo, usually dry. General Wright's wish was to cross this country obliquely, and strike the Arkansas River either at or a little below New Fort Lyon, a post then being formed at the mouth of the Purgatoire, one of the southern tributaries of the Arkansas River. The distance was estimated at about seventy-two miles, and as no guide could be obtained, the imperfect maps of the country had alone to be relied upon to direct our course.

From the great bend of the Missouri at Kansas City, to Fort Wallace, we had gradually been ascending, until at the Fort we were 3,275 feet above the sea, so that, as the elevation of the Missouri at Kansas City is 710 feet, the average rise per mile is 6·2 feet for the distance of 412 miles.

Monday, July 8.

On Monday, the 8th of July, before the sun had risen, and in a thick mist (the only one I ever saw on the plains), our line of wagons crept away from Fort Wallace, first fording the stream, and then winding about through the cliffs and broken country which separate the valley on the south side from the more lofty plateau beyond. Two days previously, the line of survey had been run across this country for six miles, so that, as soon as our wagons came to the end of this line, the engineer corps commenced work, and continued it onward as fast as possible.

The ground had to be measured, stakes driven in at regular intervals, and every undulation of the surface had to be accurately determined by means of proper instruments; and this had to be done through an Indian country, which was, moreover, so dry that it was probable we should not find a drop of water along the whole seventy-two miles. The greatest possible expedition was therefore required on the part of the surveyors, and their achievements across this country were really wonderful. There were under General Wright, at that time, three parties or divisions, each capable of "running a line" independently. At Fort Wallace, the transit-man, leveller, and topographer of each division, had obtained mules, and one of the wagons had been emptied of its contents, and devoted, for a time, to the surveyors. One division commenced work, and the men were soon spread out into line a mile long, upon the plain, measuring and taking observations at every point. On one side of this line came the wagons, following each other closely, and guarded by a small body of the escort. The remainder of the cavalry moved with the surveyors—some in front, others in the rear, and the greater number in the centre, so that, being between this body of cavalry and the wagon train, the long line of surveyors was well protected. The transit-man, carrying his instrument on his shoulder, and riding a mule at a gallop, would suddenly stop, jump off, arrange the transit, wave to the flag-man ahead, wait until satisfied of the correctness of his observation, then back into the saddle, shoulder his transit, and gallop away again. Behind him came the rod-men and levellers, mounted in the same way, and advancing with a like rapid accuracy. It was very hard on the mules, but by five o'clock that evening fifteen miles had been chained, "located," and levelled—no chance nor guesswork, but an accurate preliminary survey.

Under a July sun this activity could not possibly be kept up indefinitely; so, about every two hours, when one party was tired, those in the emptied wagon would relieve them, while the men who had been working would get in and rest. In this manner the day passed by, and evening came. After working until it was too dark to see any longer, we halted; and, too tired for the most part to pitch tents, threw our blankets on the ground, and soon fell asleep. Our day's march was twenty-one miles, but of these, six had been surveyed before.

About mid-day we had passed two pools of stagnant water, left after the rains. All the animals were supplied from these, so that they did not suffer much from thirst during the night. It was, however, a miserable camping ground, on the dry bed of a creek; the grass was scant and poor in quality; and all the mules had to be tied to the wagons, both for safety and for fear of their straying back to the last watering-place.

During the next day our tired animals toiled along over the endless undulations of the dreary, arid plain; occasionally crossing dry water-courses, but nowhere was there a drop to drink. About five o'clock, far away on the horizon, a number of black specks came in view. At first, even with the glasses, we could not make them out; though they were evidently moving and coming towards us. In half an hour we could plainly see that they were a herd of over one hundred buffalo. At this sight our hopes of finding water were greatly revived; for at eventide so large a herd would certainly not be found far from it. I could not resist a chase, although early that morning I had had a successful one. On my way towards the herd I saw evidence of a heavy local rain, and on my return found our party camped within half-a-mile of some large pools of water. Since morning we had travelled twenty-one miles, and the engineers had surveyed "a line" the whole of the way.

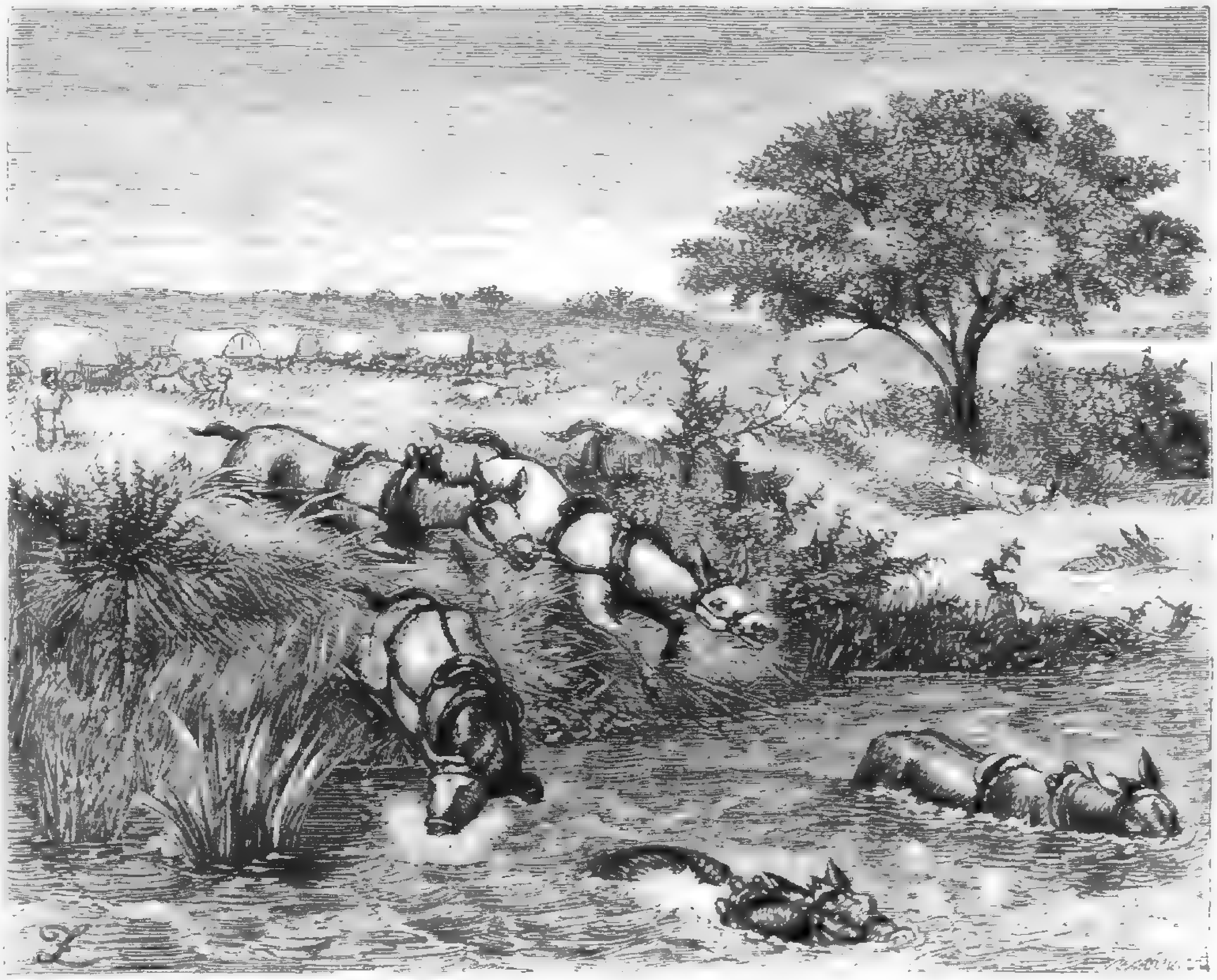
In a very few minutes our clothes were thrown off, and, like shouting school-boys, we were splashing each other in the sparkling water. These pools were all transitory, and probably in less than a week afterwards had disappeared into the sandy soil.

Long before the streak of pink and gold, so beautiful in this region, had begun to appear in the east, the heavy sleepers were roused. By five o'clock the engineers were at their transits and levels; and as General Wright was desirous that the train should accompany the surveyors, the unfed animals were slowly pulling the wagons through the yielding earth. As the day advanced, the mules of the engineers began to give out; still the party, both mounted and on foot, kept bravely on through the scorching heat, until twenty-three miles of the desert had been staked, levelled, and chained. By this time the sun was setting; and the hot wind coming from the south, sent up clouds of dust. As no "Sand Creek" came across our path, I started on a-head about four o'clock with the chief wagon-master to search for it, and, if possible, to find water to camp by. We kept a little to the right, and after a ride of ten miles came to a broad arroyo, or dry bed, which we thought might be "Sand Creek." This we followed for four miles; but not finding a trace of water, returned at sundown to camp. Two or three tents were being pitched, while several of the party, from the top of a lofty undulation, were intently viewing through their glasses a distant row of trees, and a long silver thread, winding away to the eastward. Could it be water, or only a mirage? Perhaps a bank of shining sand in some dry water-course!

As the setting sun lit up the horizon, there seemed to be no doubt, from its breadth, that, if it were water, it must be the Arkansas. General Wright consulted his maps, and concluded that this was impossible, as the Arkansas River could not be less than thirty-two miles distant. So we halted for the night. All our stock were suffering terribly for want of water. The horses stood motionless on three legs, with ruffled coats and drooping necks, now and then snuffing the dry parched grass, and refusing even to look at their corn. The mules, as is their wont, did manage to eat up their corn, but they made the night hideous with their frightful cries. A hundred mules uniting their voices at intervals in chorus, louder and more frequent as the night changes into morning; kicking at each other, and rattling their chains, in vain efforts to escape and quench their burning thirst: these form perhaps the most diabolical combination of sounds that ever broke the slumbers of a worn-out traveller. Such was the conclusion I came to, as I watched with impatience the first streak of day.

Thursday, July 11.

Four miles of travel next morning solved the question of the previous evening. From the top of our "Mount Pisgah" we had indeed seen "the promised land," the rich valley of the Arkansas, the wooded shady banks, the islands of cotton-wood trees, and the shining river. Three hours after daylight our horses were wading through a sea of long rich grass, and snorting with excitement as they smelt the water. As for the mules, they were quite unmanageable. With difficulty the teamsters prevented them from rushing straight into the river with the wagons behind them; and when once unyoked, each team, regardless of



Striking the Arkansas.

harness, with outstretched necks, and white with dust, plunged *en masse* straight down a bank 3 or 4 feet deep, and buried their heads in the water. The rapid current carried some of them off their legs, but they did not care for that, and scrambled ashore where best they could. Their thirst quenched, and their bodies refreshed, they set to work at the grass. Slowly and steadily they "crowded it down," as our teamsters remarked, until their sides bulged out to such a degree that it was evident they could hold no more.

It was delightful to see a broad stately river again, with its family of trees and waving rushes; and to hear the birds, the insects, and all the little sounds of life that you scarcely notice when you live amongst them, but which you miss so much in the desert; and these seventy-two miles we had just passed over were not only practically a desert, but by no means a good desert for railway purposes. The course we had taken was, so to speak, against the grain of the land; every undulation crossed our line almost at right angles, and would have, "on location," to be cut through. The highest of these undulations, that is, the dividing ridge between the Arkansas and Smoky rivers, was 4,028 feet above the sea; we crossed it sixteen miles from the Arkansas, and fifty-six from the Smoky River.

The Arkansas, at the point where we met it, flowed at an elevation of 3,593 feet above the sea. It is a fine broad stream, with a very rapid current, varying in depth from 10 feet to an inch or two, containing the usual snags, shoals, and quicksands of a Western river, and having an average fall of 7·5 feet per mile. The waters are muddy, but sweet to the taste; the banks consist of the rich loam of the bottom-lands, and are always falling away into the stream, at one side or the other, as the river changes its bed. On whichever side the banks are old, large cotton-wood trees grow in considerable numbers; but the side upon which the river is wont to encroach is usually bare, the trees having fallen into the current as the banks gave way. In many places the stream had made for itself an entirely new channel, and the old bed had become a thick tangle of willows, young cottonwoods, reeds, and rushes.

The Santa Fé road, from Fort Harker and Ellesworth, ran along the northern bank; and as all the wagon-trains for New Mexico took this route, from the termination of the railroad, we had no difficulty in finding out our position from the passing teamsters. We were forty-two miles east of New Fort Lyon, and six miles below the mouth of Sand Creek.

The valley on both sides, as far as we traversed it—that is to say, for fifty miles—was most fertile, the grass was of very good quality, and, like all the vegetation, grew most luxuriantly. There was no sign of alkali, nor was the valley anywhere sandy or barren. It varied considerably in width as the bluffs, which formed the edge of the elevated plateau on either side, approached or receded from the river. It seemed curious to us that, for the whole distance I have named, not a ranche, farm, hut, or cultivated patch of land was anywhere to be found. There were no flocks or cattle of any kind to graze upon the beautiful pasture-lands, if we except the few oxen and mules of the passing wagon-trains. All this abundance was going to waste, year after year, from two causes—the presence of Indians, and the absence of railroads.

Following up stream, we passed Bent's Fort, and Old Fort Lyon on the following Saturday, and arrived at New Fort Lyon on Sunday the 14th. Bent's Fort and Old Fort Lyon lie close together. The former is a small square building, placed on a bluff overlooking the river, and was garrisoned temporarily with about twenty-five men. It was the second military station established by Colonel Bent in former days. The first one, known as Bent's Old Fort, is situated thirty-four miles farther up the river, and is now abandoned.

Old Fort Lyon.

Old Fort Lyon was formerly called Fort Wise. It was of considerable size, and although it had been abandoned only three months, was so completely dismantled as to look like an ancient ruin. Its situation was very unhealthy, being exposed to floods, and infested with rats and rattlesnakes. So a new site was chosen, twenty-two miles farther west (where New Fort Lyon now stands), on an eminence on the north bank of the river. The hill overlooks the stream, is well wooded, and consists partly of a stratum of grey sandstone, very good for building purposes.

July 14.

On our arrival, all the troops were under canvas; but the officers' quarters were nearly built, and a large body of the masons were engaged in quarrying the stone for the privates' barracks, and in preparing it for use. If the present plans are carried out, this will make a very fine military establishment, especially if they continue to build it entirely of stone.

On the third day after our arrival, Captain Barnitz and his company of cavalry, having escorted us to the borders of the military district of New Mexico, retraced their steps to Fort Wallace. With them went Colonel Greenwood and his party. They did not return the way we had come, but directed their course straight for the fort, and surveyed a very good line across the arid region. Transverse ridges did not cross their path; but the country was on the whole quite as barren and worthless as that over which we had passed.

At New Fort Lyon we caught the first glimpse of the Rocky Mountains. For in the clear soft light of sunset, far away to the westward, two broad flat cones were seen to break the hitherto endless level of the horizon. These were the lofty summits of the Spanish Peaks, more than 100 miles distant.

New Fort Lyon.

The day after our arrival, a hunting party of gentlemen arrived from the East. They had had very poor sport on the way, and brought the unwelcome news that cholera had broken out on the plains, and was rapidly advancing westward. The 38th Regiment of coloured troops had been ordered from Fort Leavenworth, in eastern Kansas, to Fort Union, in New Mexico; and just before starting, this terrible scourge showed itself amongst the soldiers. A regiment thus infected, ought certainly not to have been allowed to traverse the country, and spread the contagion; but all efforts to stop it proved of no avail, so that these troops brought death and mourning, first amongst the new towns and settlements and the railway employés along the Smoky Hill River, and then infected Fort Dodge and other places on the Arkansas. In this latter district, the hunting party came in contact with it, and suffered much from choleraic diarrhœa in consequence. While camped at Fort Lyon, the tent of our geologist, and that in which I lodged, happened to be situated next to the new arrivals, and we both suffered considerably from diarrhœa in consequence. In the meantime, the coloured regiment kept gradually approaching; and Colonel Penrose, the post commander at New Fort Lyon, on hearing that they had reached the old fort, sent out a messenger to request that they should not proceed farther. The answer returned was, that daily change of camp was necessary for the preservation of the men, and that the epidemic was fast abating, although, in fact, they were camped by the burying-ground for convenience-sake. Thus the risk was needlessly run of introducing cholera into the inhabited district of New Mexico. Our parties left, however, before this regiment arrived, and we therefore escaped the serious risk of infection. Gradually, the epidemic was stayed by the careful management of the surgeon in charge, and did not extend farther west than Fort Lyon; but it was very severely felt all through Kansas, and at several points along the Santa Fé trail.

CHAPTER VII.

THE VALLEY OF THE PURGATOIRE.

A Glance of the Country ahead.—The Arkansas Ferry-boat.—Boggs' Ranche, or the First Mexican Settlement.—Its Inhabitants and their Progenitors.—Colonel Bent and his Sons.—Ute Indians.—The Valley almost uninhabited.—Its Great Fertility.—Its Fauna.—Land easily Irrigated.—We leave the Valley for the Plateau above.—Bear Rock.—Photographers in Difficulties.—The Great Cañon of the Purgatoire.—Origin of the Name.—We Capture Cattle.—Trinidad.—Lynch Law.—Fighting at Trinidad.

Distance :—In a direct line, 90 miles from Fort Lyon to Raton Mountains.

We left Fort Lyon on the 22nd of July, and camped at the foot of the first range of mountains which barred our westward course on the 4th of the following month, having travelled a distance of about 100 miles. These mountains form the Raton range, and jut out into the plains almost in a due easterly direction from the eastern main chain of the Rocky Mountains: about lat. 37°.

The summits are mostly flat, resembling, at first sight, huge masses of mesa land with steep sloping sides; but on inspection they differ entirely from the latter, being of volcanic origin, and representing a true local range, formed partly by upheaval, and partly by the solidification of molten matter poured out from the earth upon the elevated portions. This basaltic coating does not extend farther than about twenty-five miles east from Trinchera Pass, situated about the centre of the range. Here the mountains become flattened, and prolonged into true mesa country, which extends as an undulating plateau some distance between the heads of the Cimarron and Purgatoire rivers, under the name of the Mesa del Maia. The Cimarron rises on the eastern and south-eastern slopes of the Raton Mountains, from springs amongst the volcanic rocks; thence it passes over this Mesa del Maia, through which it cuts a channel, forming a cañon known as the Cañon of the Cimarron. The Purgatoire (first changed into Purgatory, and then corrupted into Pickel-Wire) rises in the northern angle which the Raton Mountains make with the main chain. Along the base of those mountains it waters a very fertile valley—the upper valley of the Purgatoire—of variable breadth, and about thirty miles long. The general course is north-easterly. Coming, at length, into contact with, or rather passing over, a northern continuation of the Mesa del Maia, this river, like the Cimarron, forms a cañon, within which it is enclosed for thirty-two miles. On emerging from this defile the river flows more to the northward, through a succession of valleys shut in by bluffs, which represent the abrupt termination of the table-lands on either side, for between fifty-five and sixty miles, when it joins the Arkansas one mile and a half above Fort Lyon. Our course ran parallel to this stream, partly in the valleys, but more generally on the dry level plateau lying to the west of them.

On leaving Fort Lyon the surveyors crossed the Arkansas River about half a mile below the mouth of the Purgatoire, in a boat which had just been built; while the wagons, and those who were mounted, passed over on an eccentric ferry-boat, which an energetic Yankee had established four miles above. By an ingenious system of ropes and pulleys he was enabled to take advantage of the strong current of the river to propel his heavy boat, in either direction, from side to side without assistance; and in this way, one by one, our train of twenty wagons and three ambulances passed over in safety. Three miles farther we crossed the Purgatoire, to join the surveyors on the eastern bank, over a bridge built by the settlers who lived in this part of the valley.

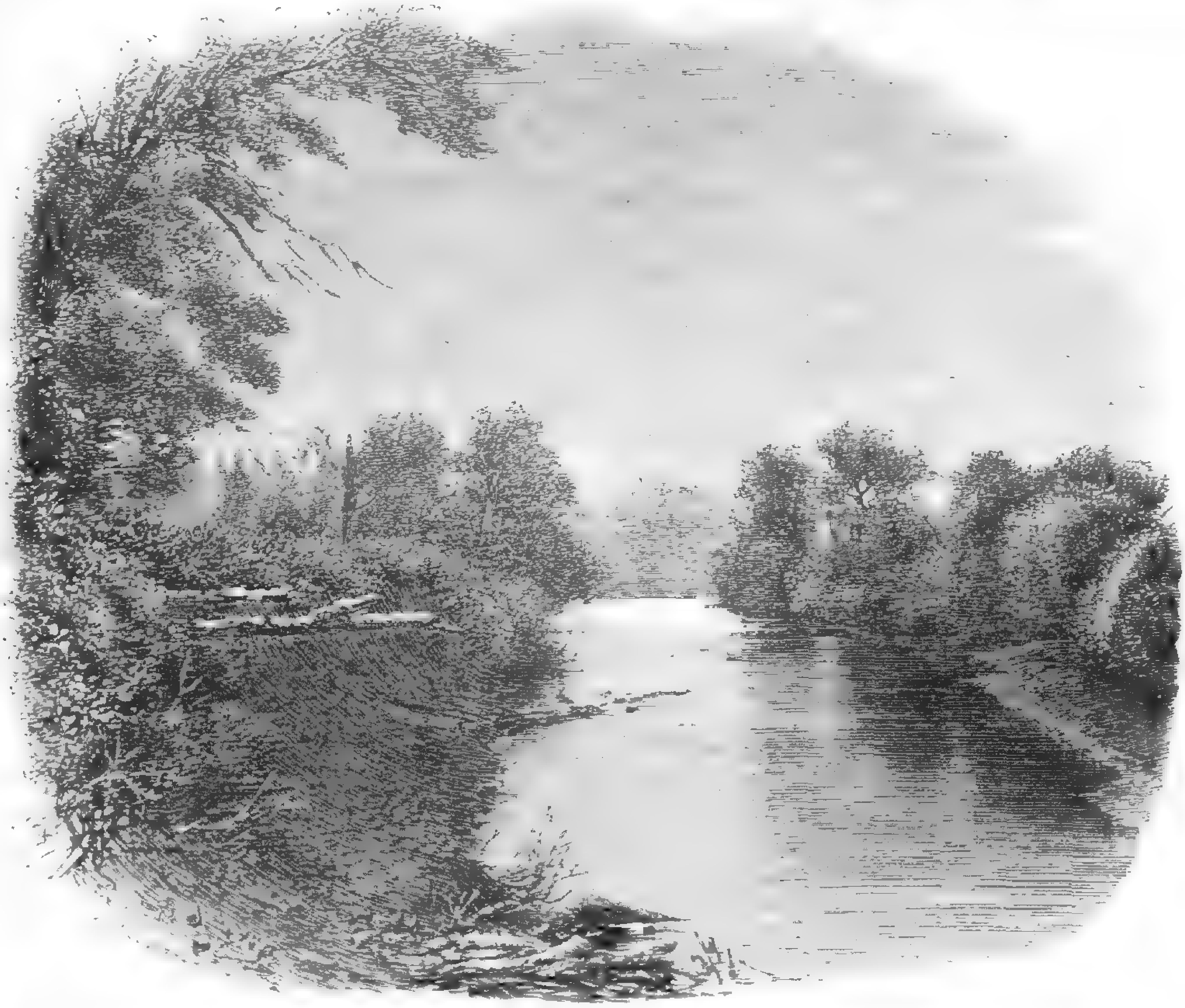
It was a great pleasure to us to find farms and settlements here, for they were the first we had met with since leaving civilisation. The banks of the Purgatoire are well-timbered on both sides, not by single rows of cotton-woods, but by groves of many kinds of trees—box, elders, willows, &c., amongst which the wild vine, the hop, and other creepers grow luxuriantly, and give an abundance of refreshing shade. The inhabitants of this little settlement formed a wonderful mixture of races; and when curiosity to see my camera had brought the inhabitants from their adobe houses and log-huts, it would have been difficult to find a more motley group.

To this point the ancient wave of Spanish occupation had just reached, and a few families of indolent Mexican half-breeds still remain to represent the Peons of a few years back. Some of them had the woolly heads of the African; in others the high cheek-bone and broad mouth of the Indian were the most striking features; while in some few the large, dark, lustrous Spanish eye shone out unmistakably from the otherwise unattractive visage. Then there was Mr. Boggs, a tall, shrewd, energetic Western man, by whose perseverance the fine fields of maize and wheat seen on either side had been planted. He gave occupation to all who chose to work, and had already 1,000 acres of land under cultivation, besides some fine herds of cattle. Every one knew Boggs' Ranche, which name embraced generally the whole settlement. Two or three other Americans, doing business in a small way, either as traders or farmers, also lived in the colony. Here also we met one of the sons of Colonel Bent, a well-known veteran of the plains. A few days previously the father had visited General Wright at the fort; he was over sixty, with small black piercing eyes, and face as deeply bronzed as that of an Indian.

The old warrior commenced life by fighting the red-skins, but afterwards married a couple of squaws, and spent nearly all his days afterwards trading amongst them in peace. The son we met at Boggs' Ranche is a half-breed, and as such is decidedly a good specimen, for in every respect the American in him predominates over the Indian. He is sufficiently educated for ordinary life, and owns a flourishing farm two miles farther down the river, which I regret not having been able to visit when invited by him to do so. He has a brother, however, whose proclivities led him quite in the other direction, and whose white blood made him even a more dangerous and relentless savage than his half-brethren. He is chief of the band of Cheyennes, to which his mother belonged, and has for years been the terror of the unprotected settlers.

To complete the group of "human curiosities" at Boggs's Ranche, a family of Ute Indians had built their little lodge of sticks and old sail-cloth in a grove behind the cattle-shed. These hideous creatures, half clothed with skins, their coarse black hair falling in matted clusters over their faces and shoulders, stared vacantly at us as we passed, and terrified our horses as much as if they had been wild beasts.

On crossing the river we found a large well-filled ranche on the opposite side, which had only just been built by two enterprising Yankees. Here we could buy everything—clothes and candles, bowie-knives and groceries, canned fruits and Mexican saddles, powder and shot, boots and shoes, caps and crinolines, Worcestershire sauce, whiskey, and drinks without end. This well-stocked storehouse, raised up in the wilds, to which everything has to be carried hundreds of miles by wagons through a hostile Indian country, speaks more for the extraordinary energy and foresight of these Western traders than any panegyric I could write. The circumstances which caused these two enterprising traders to invest their all in such a venture was simply this:—they recognised the great fertility of the Purgatoire valley; they saw the success which accompanied the efforts of the few settlers who had come there, and they became convinced that such a district could not long remain an uninhabited wilderness. So, having built their ranche at the head of the valley, where all must enter, they confidently expect soon to reap a rich and lasting harvest.



The Purgatoire River.

Eight miles up the stream there is another farm, or ranche as it is called, belonging to an American, named Sizer, who acted as our guide through this country. There may be two or three others, of small size, but beyond these the whole valley (or rather succession of valleys), from the mouth of the Purgatoire to the Great Cañon, a distance of nearly sixty miles, is quite uninhabited. If it were generally known what a beautiful country this is it would not long remain thus unoccupied. The river is deep, I bathed in it frequently and always found it out of my depth, and when we recrossed it, on the third day after our departure, we had great difficulty in finding a ford. The current is very rapid, and a large body of water is always to be found in the channel, even during the driest season. The banks are usually from three to five feet above the stream, and are formed of dark, rich loam. The average fall is from eight to nine feet per mile. To farm successfully irrigation is necessary, and for this purpose no country can be better adapted. The bluffs on either side of the river enclose between them large areas of the richest ground, which might be called bottom-lands, only they are not subject to inundation.

Riding through a succession of these valleys, we were charmed with the graceful trees, the long wavy grass, the groves and vistas which everywhere abound, and produce an effect which strongly recalls the lovely parks of the south of England. A plant (*Solanum eleagnifolium*) resembling the potato, and bearing intensely blue flowers, grows luxuriantly here, and encourages the belief that the soil, unlike that of the greater part of New Mexico, is well adapted to potato culture.* The box-elder was in bloom, as well as many other shrubs. The sunflowers grew so high as to tower above us as we rode through them. Cactus plants, which, as we went westward, had gradually become larger and more numerous, here attained the height in some places of five feet, and bore rich crimson flowers. Doves cooed and fluttered about amongst the trees and long grass; magpies visited us for the first time, and followed us hooting, as is the wont of these inquisitive birds; graceful deer hid themselves in the thickets, and wild turkeys took refuge in the highest trees; while two cinnamon bears were found amongst the currant and gooseberry bushes which grew in great abundance by the water's edge. Wherever the earth is especially bountiful, there we are sure to find abundance of animal life.

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* Amongst other plants of the same order (*Solanaceæ*) I recognised two familiar species in the *Solanum nigrum* and the *Dulcamára*; and three other very beautiful specimens peculiar to the Far West—*S. nostratum*, Pursh., a small plant covered all over with long sharp thorns, and bearing a beautiful yellow flower, *Physalis lobata*, Torr., and *P. longifolia*, Nutt., both very singular varieties of the ground cherry. Two more plants I must mention as peculiarly beautiful productions of the Purgatoire valley; the first is an

By taking advantage of the rapid descent of the river, every one of these valleys could be most easily irrigated. A main ditch, or "acequia madre," running close to the bluffs, could be dug around each of them, and smaller ramifications could be brought across the space thus enclosed. Our guide boasted of having raised by irrigation on his farm eighty bushels of Sonora wheat to the acre, and forty bushels of oats; and showed us a number of wheat ears as specimens, which, both in size and weight, were astonishing samples. The fields of maize and other produce which we saw looked most beautiful; the wild hops were twice as large as any I have ever seen in Kent, and unpleasantly reminded me of the absence of bitter beer. Besides the fertility of the soil, two other facts are of importance to the settler: the high price of all agricultural produce, and the inexhaustible nature of the soil when cultivated by irrigation.

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exquisite little crimson convolvulus (or rather *Ipomea*), quite new to both Professors Gray and Durand, and probably unique (No. 54 in my collection), the other is an equally delicate species of *Commelyna* (No. 35).

Every time the muddy water of the river is turned upon the land, it deposits its sediment, highly charged with the fertilising produce of the decomposed mountain rock; and, like the Nile, always keeps the ground rich and productive, without any other kind of manure being necessary.

July 24. Leaving the valley on the 24th of July, for the more elevated plateau, we found the country everywhere covered with the rich Grama grass of New Mexico, yielding the best possible pasturage; and day by day, as our course led us usually some eight or ten miles from the river, we had no difficulty in obtaining good camping places, at the head of some ravine or washed-out gully, which cut its way through the edge of the plateau into the valley. In such a situation we usually found a good spring or a water-hole, hollowed out in a rock, containing a plentiful supply of good water.

Along the sides of these ravines, and dotted about along the hillocks and cliffs, were abundance of cedar trees, but these were seldom large enough to be useful for any other purpose than fire-wood. Over all this pasture region, it was rare indeed to see domestic animals of any kind, though herds of antelope were abundant. Once or twice a miserable flock of Mexican sheep, or rather sheep and goats mixed, were found in some hollow; but as a general rule, the whole of this district is at present unoccupied.

On the 25th, we visited a curious monument on the face of a sandstone rock, facing the Purgatoire, about forty miles from its mouth. This was a representation of a bear, rudely painted, life size, on the flat porous surface. The proportions were good, and the attitude very natural. The animal was represented sniffing the air, and the colouring matter used had sunk so far into the rock, that although it had to some extent peeled off in layers, the image was not by any means defaced. Nothing is known of its history, either by the Mexicans or the wild Indians, who seem to hold it in veneration, probably as a medicine charm; for many rude representations of lizards, beavers, and other animals of grotesque form, were scratched around it in Indian fashion. Some few beads were also found about the rocks, and some grooves, made by sharpening the iron heads of the arrows, were cut into the stone in several places. The painting was most probably made by a party of French or Spanish explorers at some distant period, either as a sign to show the direction they had taken, or to mark some treasure hidden away by them. No treasure, however, has yet been discovered there. The place is difficult of access, and can only be found by one well acquainted with its exact position.

On the 26th, General Wright, Dr. Le Conte, myself, and a few of the escort made a détour of twenty-six miles through some of the valleys which lie, like links in a chain, along the course of the Purgatoire, and are similar in their beauty to those which I have described above. These valleys averaged about seven miles long by from one to three broad, and were separated from each other by the close approximation of the bluffs to the river here and there for a short distance.

We left the river near the lower end of the Great Cañon, and passed on to the upland country or plateau by means of a side ravine six miles long. Some fine water-holes lay at the entrance of this ravine, to which next morning we moved our camp. As soon as tents were pitched, I retraced my steps down the ravine, with photographic "outfit" strapped on a mule, accompanied by Mr. J. Bell, whose kindness in assisting me on so many occasions I shall ever remember with gratitude. Our object was to penetrate, if possible, into the Great Cañon and take some views of it. We were, however, prevented by the escape of our mule, who broke away while we were engaged in taking a view in one of the valleys, and ran back to camp as fast as he could.

Next day we brought back the defaulter, and pushed forward towards the cañons; but the huge rocks and fissures which blocked up the sides, and the trees and brushwood which choked the passage, made our advance so difficult that we were obliged to relinquish the idea of taking any views of the gorgeous scenery, the sight of which amply repaid us for our trouble.

The walls of the cañada, or little cañon, leading from our camp to the river consisted, for the first three miles, of grey sandstone cliffs, but below this point the grey walls began to give place to lofty masses of deep red sandstone. Gradually as we advanced, this formation took the place of every other kind of rock. Its texture was soft, and the hand of time had honeycombed it with little caverns and holes of every shape and size; lofty spires and fantastic minarets towered upward towards the sky; while at our feet huge masses of nature's masonry, piled up in endless confusion, barred our way. With great labour we overcame these obstacles, and a little farther on became entirely surrounded by the perpendicular walls of this bright, fiery red sandstone.

We had come to the entrance of the Red Rock Cañon; and never have I seen anything to equal the wonderful effect of this mass of colour. There cannot be a doubt that, coming unexpectedly upon this marvellous spectacle, *Purgatory* was the instant and unvarying idea impressed upon the imaginations of the French explorers from Louisiana who first visited this spot; for it seemed only just out of some mighty furnace, and looked as if, a little farther on, within the narrow jaws through which the boiling waters came seething down, the whole chasm was even then red-hot, and ready to engulf those whom *Holy Church* had doomed to destruction. An Indian trail, overgrown and abandoned, led through the defile, and could easily be traced, except in those places where it was necessary to travel in the bed of the stream. We heard that it was possible, though very difficult, to pass completely through this cañon, but we met no one who had done so; and want of time obliged us most reluctantly to give up the attempt ourselves. Its length is about thirty-two miles.

Between the grey and red sandstone a stratum of snow-white gypsum crops out at several places near the commencement of the cañon; and this position seems to be very constant, not only here, but in Arizona, as mentioned by Dr. Newberry; for wherever the space between these two strata was exposed, a layer of gypsum was almost invariably found lying between them. Dr. Le Conte received information of a bed of alum, several feet thick, some eight miles up in the cañon, and obtained specimens of it in Trinidad.

Soon after leaving Fort Lyon we were joined by Mr. Boggs, who drove up in a very nice buggy, drawn by a pair of beautiful bays, in the sleekest possible condition. This gentleman most kindly remained with us several days, and gave us much information about the country.

On the 29th, while riding ahead of the train, we saw at a distance a herd of cattle grazing peacefully on a sloping hill. Mr. Boggs and myself immediately pushed on to make good our discovery by buying one of the oxen; but after making a circuit of ten miles, we could find neither hut nor herdsman nor any sign of living being. So we drove some thirty oxen back into a ravine, at which place the wagons had been directed to stop, and by the time the train had come up, a fine young cow lay ready for the butcher's knife. We all supped well that night, for the beef was fat and well-flavoured, while our beans and bacon had long ceased to be a novelty.

Next morning I started, with a sergeant and two men, for Trinidad, the first and only Mexican town to be found north of the Raton Mountains. It is situated close under the mountains, in the upper valley of the Purgatoire, and at the foot of Raton Pass, through which the Santa Fé road runs. There is a post-office here; and it was for the purpose of inquiring for letters and posting those of the party that I made this trip.

July 29.

A more complete specimen of an Americo-Mexican town than Trinidad could not be found. It consists of a main street, lined on either side by adobe houses of one story, with flat roofs and few rooms. Many of these were "stores" belonging to American traders, and well stocked with goods; two of them were billiard-saloons, and two were boarding-houses—all American innovations. There was no public-house proper, but strong drinks were sold at every one of these establishments, and, so far as I could make out, at every house in the town. "Liquoring up" seems to be the sole amusement of the inhabitants. It commences before breakfast, goes on all day, and begins again with renewed vigour at sunset.

All the upper valley—viz., that above the cañon—is settled by Mexicans; and there is scarcely a mile along the stream in which you do not find a ranche or two. Each farmer irrigates as much land as he is able to look after, and finds a ready market for the produce here.

There are no police, no magistrates, no military; so the people take the law into their own hands, and deal out summary justice to all offenders. Horse-stealing and cattle-lifting are punished, as a matter of course, by death. The proper amount of punishment necessary for murder depends upon circumstances and the social status of the murderer.

I was passing away an hour or two of the evening in one of the billiard-saloons, watching the strange and grotesque appearance of the motley crowd of "loafers" and others, all armed with bowie-knives and revolvers, when I noticed a tall, well-built fellow, his face covered with long, wiry, dark-red hair, and his legs almost hidden in those enormous top-boots so much in vogue amongst miners. He was taking a drink with a friend at the bar. After this he went out; and so many followed him that the room was left comparatively empty. This most ordinary occurrence suggested nothing to my mind; but at breakfast next morning, the good landlady, with the delightful loquacity peculiar to her calling, disclosed to me its real meaning. The tall, red-haired miner of the evening before had robbed and murdered his companion a year previously near this place, and had made good his escape to Denver. Trusting to the change he had made in his appearance, he had ventured back to his old haunts at Trinidad. A few days after his arrival, first one and then another recognised him, and laid their plans for his capture, which were quietly and skilfully carried out before my eyes in the billiard-saloon. He was invited to drink at the bar; then, on being told that some one was waiting for him in the street, he went out directly, and was immediately surrounded. Seeing that resistance was useless, he quietly remarked that they had been one too many for him this time; and, without more ado, walked with them to the inn. Before twelve o'clock that night he had been tried, condemned, and executed.

While I was enjoying the luxury of a comfortable night's rest in a bed (a rare luxury), the corpse of this miserable man swung to and fro from a tree in the coralle within a few yards of my window. Our landlady was much grieved that all her eloquence had failed in making a penitent of the murderer. She had lectured him for fully an hour, and yet he remained unmoved. It was evident, therefore, that he fully deserved the fate which Lynch law had decreed for him.

Barbarous and uncivilised as this rough kind of justice is, especially amongst Europeans in the nineteenth century, I doubt whether it is not better than the systematic evasion of justice which is so commonly practised throughout the Western country where the formalities of law are gone through, either by local magistrates or the officers of military establishments, but where criminals of all kinds usually escape with little or no punishment. I speak from actual knowledge when I say that my horse is safer in a coralle at Trinidad, than in an officer's stable in Fort Union.

It was impossible for a passing visitor to tell how the Americans and Mexicans managed to get on together. There appeared to be every prospect of peace at the time I was there, but before the autumn had far advanced, a very different state of things seems to have arisen. As far as I could make out from the reports which reached me at San Francisco, one of the Americans had shot a very popular man amongst the Mexicans in a midnight brawl, and as the friends of the former refused to give him up, the Mexicans united in a body of five hundred strong, and attacked the place. The Americans were so greatly in the minority, that they were obliged to take refuge in their houses, and sustain a siege for nearly a fortnight, during which time some seven Mexicans were shot by the defenders. As military assistance did not rrive, and provisions at last began to fail, the Anglo-Saxons ad to surrender, but under what conditions I could not iscover. When the soldiers at last arrived, the war was ver, and the little population had returned in peace to their rmer occupations.

After stopping the night at Trinidad, I returned to the urveying party, which I found camped about twenty-five iles distant, on the banks of the Purgatoire, within a few ards of the mouth of the Great Cañon. We remained here hree days, in full view of the mountains, during which time eneral Wright examined some of the passes, and decided pon our future course.

CHAPTER VIII.

THE RATON MOUNTAINS.

Passes in the Raton Mountains.—Head of the Purgatoire Cañon.—Photo graphic Difficulties there.—Colonel Burgeman and the Guide, Francisc sent by the Merchants of Santa Fé to welcome and assist us.—We surpris an Indian Camp.—The Flight.—The Parley.—The Chase.—Trinchen Pass, Origin of its Name, Trap Dyke.—Fertility of Raton Mountain Trees, Flowers, and Game.—Arrival of General Palmer.—Antelope ver Abundant, how to kill them.—Discover Cimarron Pass.—A Night wit the Ranche-men in the Mountains.—Head Valleys of the Cimarron Rive —Extinct Volcanoes.

THERE are four passes through the Raton Mountains; tw are practicable for wagons, and two are not.

The most western is Raton Pass, through which the Sant Fé road runs. This is the travelled highway over the moun tains. It passes around Fisher's Peak, the most lofty pile basaltic rocks in the range, is 7,169 feet above the sea, an twenty-two miles in length.

The next pass is that known as the Manco del Burro (th Pass of the Lame Donkey). Coal was discovered here b Mr. Eicholtz, but Captain W. F. Colton, on making a secon examination, could only find three narrow veins, separated b thick beds of sandstone. The pass is rugged, and the wors of the four.

Next comes Trinchera Pass, situated about the centre the mountains, and thirty-five miles east of Trinidad. It i by far the best natural highway across the range; an although it had not been used for wagons until our trai passed through it, there is no doubt that a very smal outlay would make it, not only a shorter, but a better rout o Fort Union and the south-west, than that *viâ* Trinidad nd Raton Pass. Its elevation is 7,079 feet. For seven iles it leads straight across the mountains with an average rade of from 90 to 116 feet per mile; it then descends more radually for three miles, ending in a valley running at right ngles to it.*

Lastly, a fourth pass was discovered by General Wright, bout fourteen miles farther east, lower than any of the thers, most suitable for a railroad, but too rough either for a agon road or even a mule path. This has been named imarron Pass; its elevation is 6,166 feet.

While camped at the mouth of the Purgatoire Cañon, I xamined that end of it. None of the grandeur of the Red ock Cañon was to be found here; the walls were perpenicular only towards the top, and were composed of grey andstone, somewhat metamorphosed, probably from their roximity to the Raton Mountains, which are partly volcanic. hey did not exceed 200 feet in height, yet it was difficult ravelling along the banks, for it took my friend Walter Hinchman and myself four hours to lead a mule packed with ay photographic "outfit" two miles, in which short distance ve nearly lost our valuable quadruped in a quicksand, and ad to load and reload at least half-a-dozen times.

In the evening of the 1st of August we received at camp great acquisition to our party, in the arrival of Colonel Burgeman, who had been chosen by the gentlemen of Santa Fé to welcome General Wright and his engineer corps at the hreshold of New Mexico. He brought with him the most amous guide of that part of the country, Francisco by name, a tall wiry Mexican, whose seventy summers had certainly no lessened his powers of observation or his "bump" of localit Not a trail or a spring was unknown to him; and no matte how confusing the country was, he was always right in hi directions. The thoughtful courtesy thus extended to us b the people of Santa Fé, and the kindness and affability o their representative, was fully appreciated by all. For mysel I can only add, that I wish one met more frequently such thorough gentleman, in every respect, as Colonel Burgema

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* The traveller to Fort Union should then follow the valley for three miles n an easterly direction (turning to the left), when he will find an easy passage ut of it at the foot and to the right of La Tenaja into a broad plain called Hay March.

August 4.

On August the 4th we broke camp at the head of the cañon and marched to the foot of Trinchera Pass, a distance of abou thirteen miles. During the march, Genera Wright, Dr. Le Conte, Colonel Burgeman, wit his guide, Francisco, and myself, accompanied by Captai Cane, who commanded our escort, and half-a-dozen cavalry went ahead to reconnoitre the country. We had not advance more than three miles in front of the train before we saw i the distance two or three parties of men moving towards u from the east. At first we took them for Mexicans, but o closer examination concluded that they must be a party o Ute Indians, returning from a foraging expedition to thei homes in the mountains. A little farther on we ascended a hil covered with cedar and piñon trees, from which we expecte to get an extended view of the country. We here ran straigh into an Indian rancheria. The red-skins had just made off, an were galloping away as fast as their ponies could carry them leaving the ground strewn with all the litter of a camp. Th warriors stopped about a mile from us, and being joined b those coming up, watched us as closely as we did them; fo we were somewhat puzzled to tell why, if they were Utes with whom the settlers are at peace, they should make s precipitate and suspicious a flight. From the high groun occupied by us, we sent two of our number—Francisco, the Mexican guide, and a sergeant—out towards them, to invite a parley. They in like manner separated two men from their ranks; but, instead of waiting where they were, the whole party stealthily followed close in the rear of their representatives. Much shaking of hands accompanied this meeting of the respective delegates, during which time the other warriors were able to come up and join them. As Francisco and the sergeant did not immediately return to tell us of what tribe the Indians belonged, but advanced towards us with the rest, Colonel Burgeman went out to meet them, and soon returned with a very troubled face, saying that he was certain all was not right. Their story was that they were friends of the white men, but had come to fight the Utes, who had been hunting buffalo in their country; they begged to be lowed to take away their things, but did not seem to be inclined to say who they were. As they were formidable in numbers, and well armed, we did not think it advisable to refuse their request.

Retiring a few yards, and presenting a bold front to them, we watched their proceedings. They were painted in the most approved style for warriors on the war-path, with feathers, gay-coloured trappings, silver ornaments glittering in the sun; and besides these barbaric adornments, one man wore a blue coat with brass buttons, the chief a cocked hat; some wore waistcoats; and the only squaw amongst the party, who rode astride on the right of the chief, appeared to be the happy possessor of a gaudy pair of pantaloons. Her breast was bare, and her dark hair, which hung down over her shoulders, half-concealed her crimson-painted cheeks.

Without doubt we were mutually afraid of each other. While gathering up their traps, only a part of the warriors were dismounted at one time, and when their goods and chattels had been secured, they seemed in no great hurry to be off, but commenced to eye us suspiciously, whilst they passed backwards and forwards, and in and out amongst the trees, for no apparent object but that of gaining time.

In the meanwhile, however, a messenger had been sent back by Captain Cane for reinforcements, and just, I may say, at the critical moment, a fresh body of cavalry dashed up the hill. In an instant the red-skins were in their saddles, and galloping away like the wind. General Wright was opposed to the use of any violence on our part if it could be avoided, but had we known then what we learned a few days afterwards, these painted gentlemen would not have escaped so easily. Captain Cane and his men chased them for about four miles, and blazed away at them, to serve as a gentle hint to make themselves scarce. A few shots were fired in return, but no casualties probably occurred on either side. Curiously enough, this was the first day since leaving civilisation that I had travelled unarmed, and I took good care that it should be the last.

These Indians were Arapahoes, and had joined with the other Plain Indians in the general war. The object of their present expedition into a district of country not their own, was to try and persuade the Utes of the mountains to join the hostile confederation; and they had entrusted a broken spear and a quiver of blunted arrows to the care of a Mexican, who promised to carry them as an overture of peace to the Ute nation. They had plundered several of the outlying Mexican ranches, and scared away the scattered settlers, who left their corn nearly ripe, and everything else, in mortal fear of the red-skins. All the meat and flour which we found on the hill, and which were thrown away a second time in the flight, had been obtained by plunder from the unfortunate farmers. Had we not most opportunely stopped these marauders just at the outskirts of the settlements, a great part of the upper valleys of the Purgatoire might in a few days have been swept bare of everything—flocks, herds, farm produce, and inhabitants.

The foot of Trinchera Pass made a beautiful camping-place. A clear, sparkling rivulet flowed down from the pass, which was bounded on both sides by lofty basaltic cliffs. Close to our tents, a beautiful specimen of trap dyke crested a range of foot hills, having a direction south, 60° west. It looked exactly like an old wall, broken down in places by time. The large bricks were piled one upon the other with wonderful regularity; and where the stream passed out upon the plain, a fine gap was left, forming the gate of the pass.

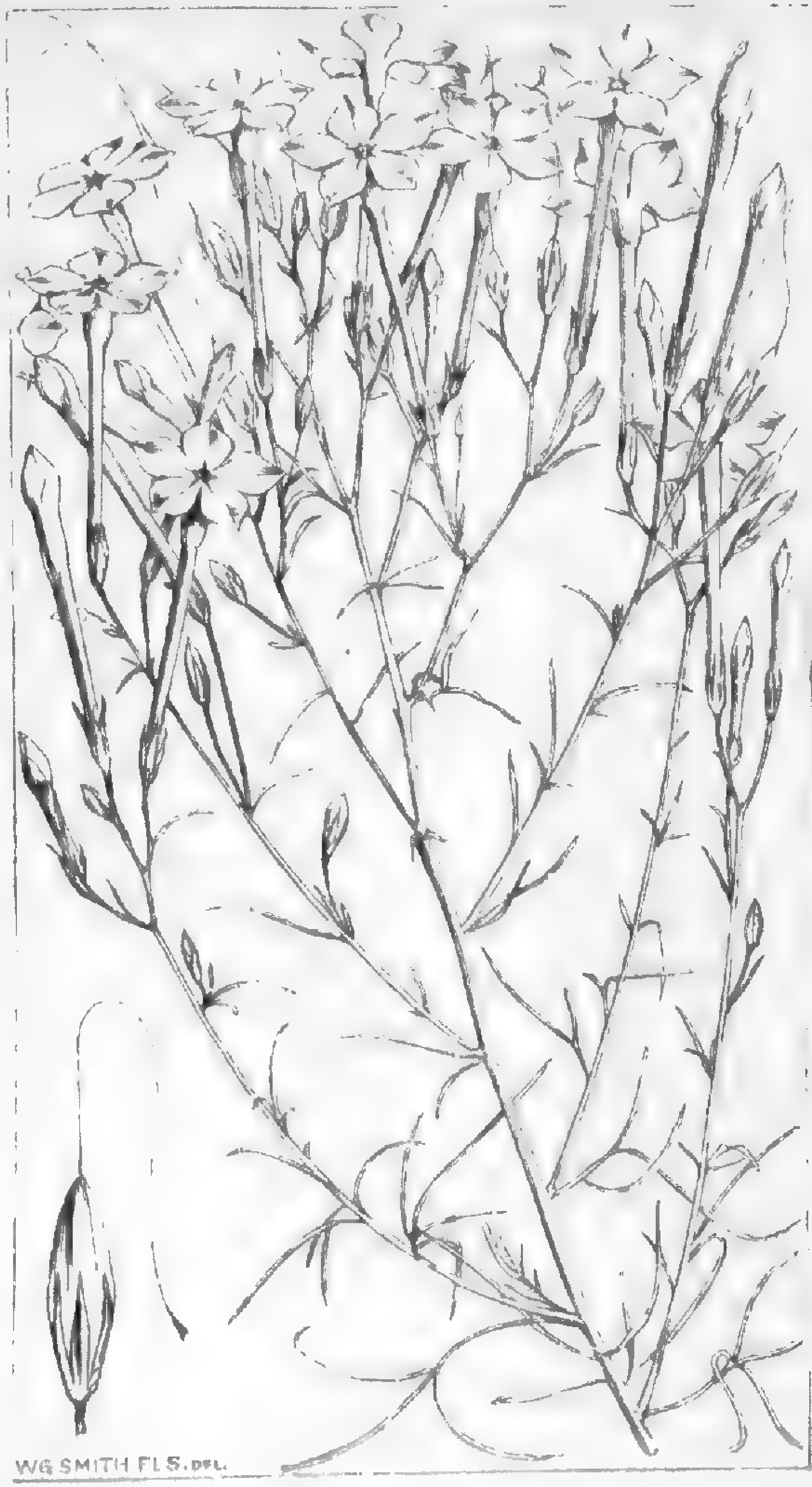
Our party remained here from the 4th until the 12th of August, so that there was abundance of time to examine the fresh country we had just entered.

The soft murmur of the brook was sweet music to our ears, and all the variety of mountain scenery looked more lovely than ever, from the contrast it presented to the monotonous plains over which, for the last two months, we had been travelling. There is nothing bare or rugged about the Raton Mountains; every part is covered with vegetation, except the perpendicular ledges of basaltic rock which fringe their flat summits. The richest pasture fills the valleys, and gradually gives place to piñon woods and thickets of locust and scrub-oak. Higher up in the ravines, tolerably large oaks are found; and, higher still, large clusters of noble pines group themselves around the summits. In my many rambles, I collected quantities of wild flowers, which, in beauty and richness of colour, could not be surpassed. Little mountain marshes were often met with, and in these I found some great botanical prizes. When a railroad brings these mountains within reach of the botanist, he will there find that exquisite little lily, *Calochortus Venustus*, and amongst the Labiatæ, *Monarda fistulosa* (No. 66) and *M. aristata* (No. 65). Of several Penstemona, *Penstemon barbatus* (No. 81), with its gorgeous crimson flowers, will rival any other species in that gay family; numerous species of Gilia will be carried back to adorn our gardens, the most beautiful in my collection being *G. longiflora* (No. 58), a very graceful plant with delicate blue flowers, *G. pulchella* (No. 57), the queen of the family, with flowers of every tint, from pure white to rich pink, and *G. teniflora* (No. 56), a yellow variety. Twenty more species of this family have been collected in New Mexico. Conspicuous, amongst other plants, are *Ipomœa fandurata* (No. 55), *Castilleja integra* (No. 72), *Polygala alba* (No. 86), and *Lysimachia ciliata* (No. 83). Both black and white-tailed deer are numerous; and, judging from the tracks, I should suspect abundance of bear, for in some places nearly every stone had recently been turned over by those animals in their hunt for beetles, of which they are very fond.

August 7.

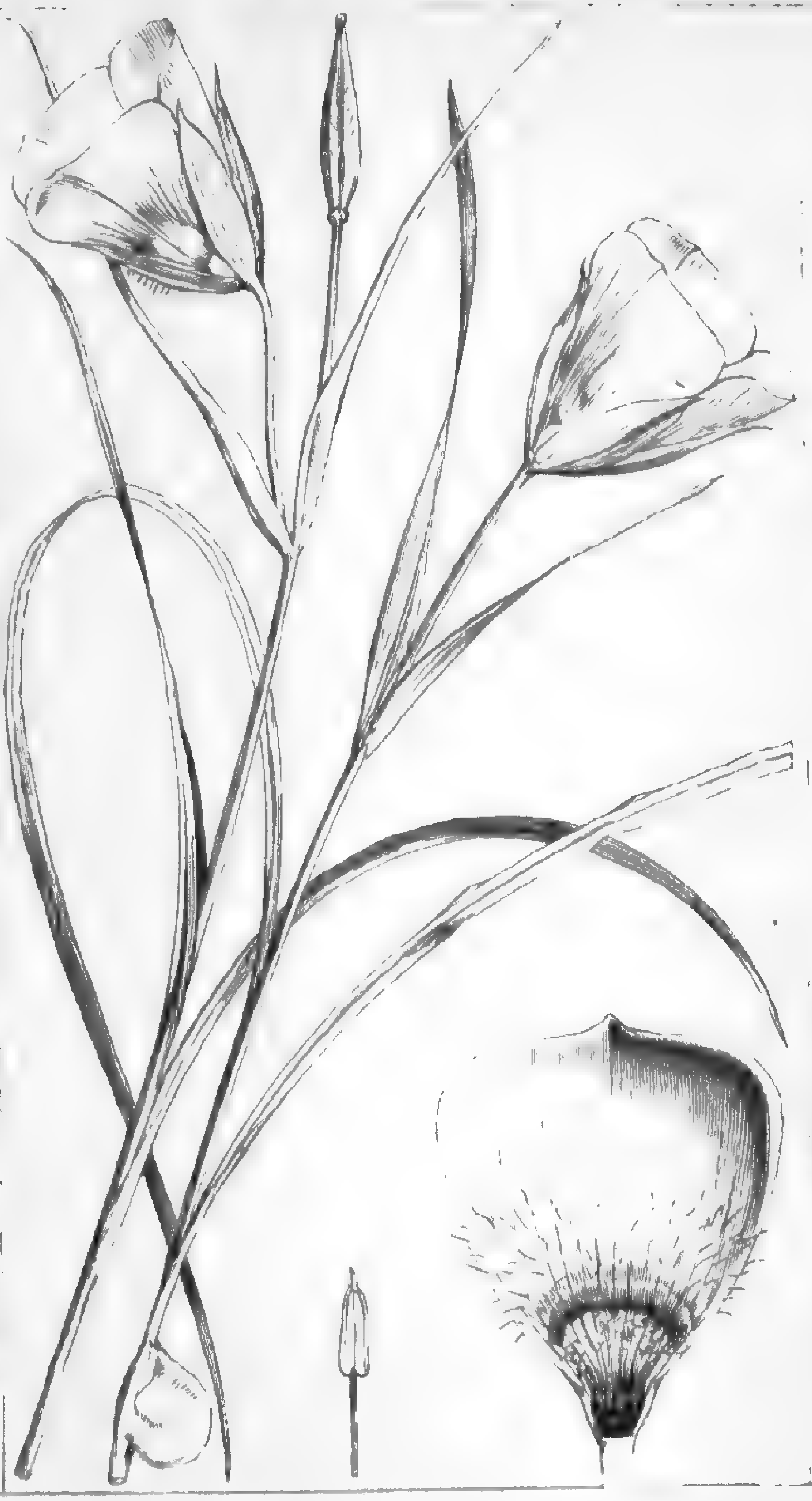
On the evening of the 7th of August, General W. J. Palmer, treasurer and secretary of the company, accompanied by Captain C. F. Colton, his private secretary, arrived at our camp. He came to relieve General Wright on the Rio Grande, so that the latter could return and place the results of the survey up to that point, before the directors, who were impatiently awaiting the requisite information to obtain the necessary additional aid from Congress before continuing their railroad farther into the heart of the continent. I had met Palmer previously at St. Louis, but I little thought, when I shared my tent with him and

POLEMONIACEÆ.


W.G. SMITH F.L.S. DEL.

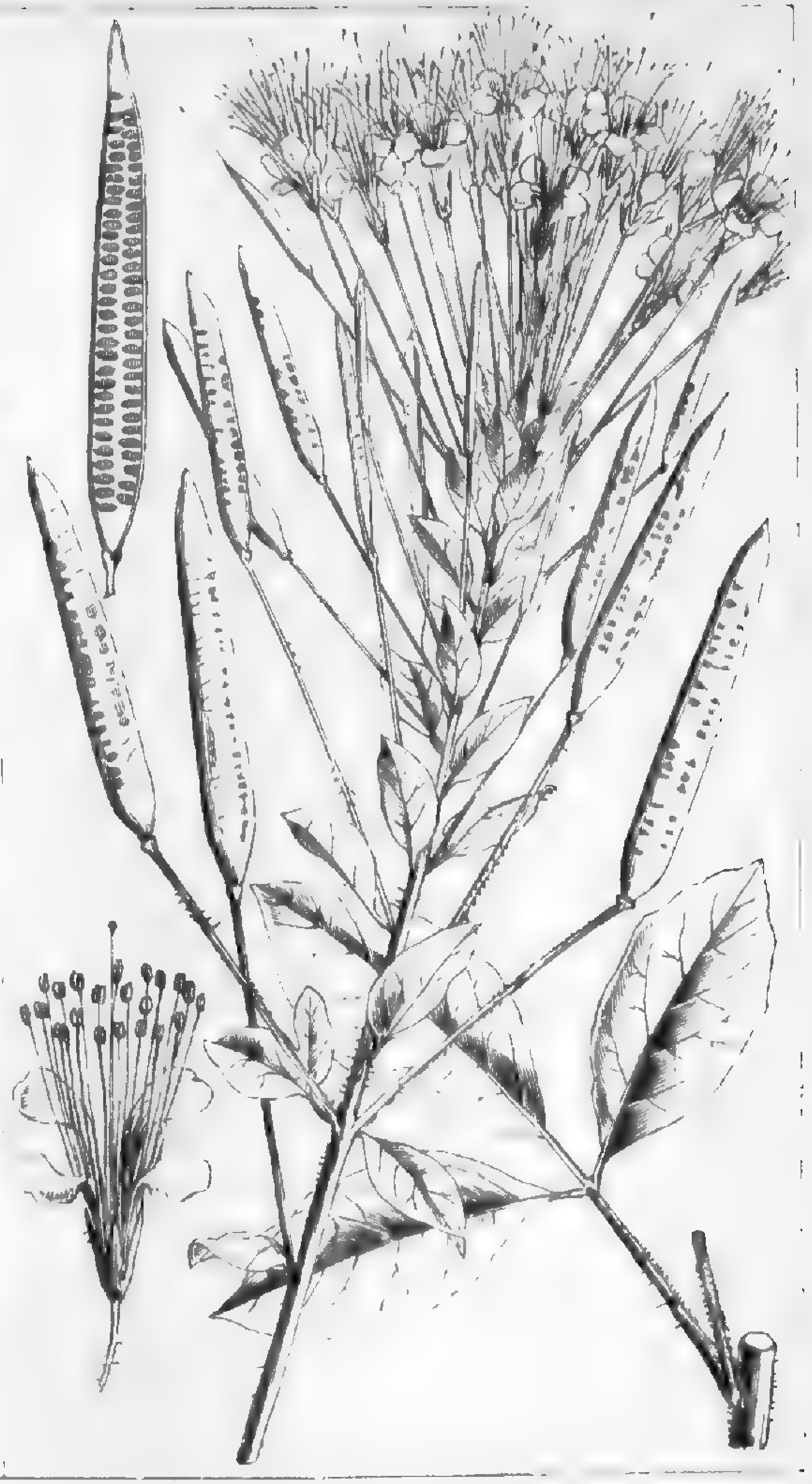
GILIA LONGIFLORA, BENTH.
(Half natural size.)
Capsule natural size.

LILI



CALOCHORTUS VENUSTUS, BENTH.
(Half natural size.)
Petal and Stamen natural size.

CAPPARIDACEÆ.



POLANISIA GRAVEOLENS, TORR.
(Half natural size.)
Flower natural size.

Colton on their arrival in camp, that we should all three become such friends, or travel so many thousand miles together. In introducing my readers to these, my two best friends, it is necessary to say that Palmer and myself are about the same age, that is, under thirty; though active service in the war, and the responsibility of being the moving spirit of a great company, have added a few years, in moral nfluence at least, to the former. Colton is quite young, and one of the best fellows living.

August 9.

On August the 9th, while the working parties were occupied in surveying Trinchera Pass, General Wright, General Palmer, Colonel Burgeman, &c., started to examine the eastern end of the range. As we traversed the plain lying south of the mountains, we found he antelope so numerous that they were scarcely ever out of ight. At every mile we started a fresh herd; but these imid, watchful creatures take fright so easily, that it is next o impossible, unless you stalk them with the greatest caution on foot, to get close enough for a good shot. It is common amongst the Mexicans and Indians of the country for one of the hunters to envelop himself in a deer-skin, with good-sized antlers, and then to approach the herd, often stopping to lie down, or pretend to graze; sometimes retiring, and again advancing; until curiosity brings the antelope all round the intruder, when he is able easily to bring down his victim.

Having skirted the mountains for about twelve miles, we came to a gap in the range, the situation of which was especially advantageous, for it lay exactly opposite a grass valley or depression in the plain, known as the Chaquaco alley, stretching northward to the lower end of the Red ock Cañon of the Purgatoire. We therefore entered the ap and, ascending for two or three miles, soon came into some very rough broken country, with bluffs and cañons on all sides. With difficulty we descended into a wide ravine or valley, running nearly east and west, where we saw some cattle grazing; and then, continuing our eastern course along it, we came upon some ranches owned by two Americans, Emery and Murphy by name. As it was nearly six o'clock we determined to stop here for the night, and while feasting upon some excellent black-tailed deer, provided by our hospitable hosts, we had a pleasant chat about their fine domain.

This is one of the chief head valleys of the Cimarron, and is well watered by a perennial stream. Through it runs a trail which, though a very good one, is used only occasionally by wagons passing between Fort Union and the Arkansas.

Murphy had two hundred acres of land under cultivation, which he irrigated or not, according to circumstances. Although he did not consider irrigation necessary, he found that it paid well to employ it, as it prevented the risk of failure and increased the productiveness of the crop. Emery had turned his attention to stock raising, and spoke most highly of the whole district. His cattle were in fine condition, and they could not have been otherwise with an unlimited supply of such rich pasture to feed upon. It is unnecessary to house either sheep, oxen, or horses during the winter, for neither frost nor snow are ever severe in any of the valleys on the southern slope of the mountains, and but seldom affect the pastures in any of them.

Next day we completed the circle by returning on the other or southern side of the range, and recrossing it through the Trinchera Pass to camp.

On some of the heads of the Cimarron River, which we passed *en route*, there were two or three ranches owned by

Mexicans, who kept a few cattle and goats, and farmed on a small scale; but, excepting this, the land was uninhabited. Yet, on the whole, this section of country is well suited for agriculture and stock raising, and, as we shall see presently, for coal mining. There is pine timber enough for local use and railway purposes, but not for transportation. The position of this district is most important, for it lies between that part of Kansas which is unsuited for agriculture, and some of the richest mineral regions in New Mexico, the development of which must stimulate and ensure the success of agricultural efforts throughout the Raton mountains and the valley of the Purgatoire.

Several conical mountains, with extinct craters, are to be found at different parts of the Raton range, especially on the south side. Before leaving the neighbourhood I ascended with Lieutenant Lawson the most conspicuous of them (called "La Tenaja" by the Mexicans), but although the crater was about 500 feet deep, and very well defined, there was no appearance of anything like recent activity.

CHAPTER IX.

RED RIVER VALLEY.

Our Wagons cross the Raton Mountains in Safety.—The Surveyors in Difficulties.—Reach the Head-waters of the Canadian River.—Red River (Terminal Branch of the Canadian) Valley.—The night-blooming Prairie Lily.—A Fresh Line has to be surveyed from the Purgatoire to Red River.—Map-making under Difficulties, or a Sketch of our Camp Life.—A Visit to Maxwell's Hacienda.—The Indians we found there and their Mode of Life.—Energy and Success of Mr. Maxwell as a Pioneer and Settler.

Distance:—From Raton Mountains to Red River, 64 miles.

ON Monday, August 12th, General Wright, General Palmer, and party, with four wagons, started for Trinidad and the Raton Pass, while the rest of the engineers, having completed the survey of Trinchera Pass, struck tents and passed on through it, with the diminished wagon-train, to the south side of the mountains. Having got our wagons through the pass without accidents of any kind, we camped in the valley beyond, which meets it at right angles. Next day we turned down this valley to the left and found a very easy exit from it, at the western foot of the extinct volcano, "La Tenaja." This led us into a broad plain, extending for thirty miles or so in a south-south-western direction towards Fort Union—the largest military post in New Mexico. In the centre of this plain is a marsh of considerable size, known as "Hay Marsh." We had had rain nearly every day for a week past, and the ground was very soft and heavy for the mules; so, as we did not care to stop by the marsh, we pushed on to the entrance of a valley

August 13.

trending westward, and camped on a stream, after having travelled twenty-three miles. This was the first tributary of the Canadian River, or rather Red River (as it is called near its source), we had met on our route. The surveyors, however, who expected to obtain a good and short line through a subordinate range out of the valley which we had left in the morning, found the country much more difficult than they had expected, and were not fortunate enough to find a practicable passage into Hay Marsh, west of the foot of Trinchera Pass. They did not reach camp until very late, leaving the end of their line ten miles in the rear.

August 14.

The 14th was spent in running this unsatisfactory line from its termination to camp.

On the 15th Colonel Burgeman and myself pushed on down the little tributary of Red River until we came in view of the main valley, in which we had the good fortune to recognise the four wagons and one ambulance of General Wright and those who had gone round by Trinidad.

Flat-topped hills* stretched down from the Raton Mountains along the eastern side of the broad Red River Valley, while at the other side rose the Rocky Mountains themselves. Having sent a cavalry man forward to acquaint General Wright of our whereabouts, we returned to camp to report that Red River was ahead, and that General Wright and his party had been recognised. So we moved camp a few miles farther down the stream, and next day made the connection, camping altogether on Red River, four miles below the spot where the main road to Santa Fé crosses it. The bluffs at the back of this camp, which here encroach upon the river, were covered with a plant until then unknown to me. This was a very large night-blooming Mentzelia (*M. ornata*, Torr.), called by the ranche-men the Prairie Lily. The flowers are larger than the finest water lilies, of exquisite whiteness, and remain closely shut all day, and even at sunset do not open. But at 10 o'clock, when I visited them in the bright moonlight, every petal was expanded to its full length, the barren rocks were changed into a perfect fairy-land, and the air was richly scented with the fragrance of the flowers. A full-grown plant stands from three to four feet in height. The petals measure three inches, stamens two inches, leaf four inches in length. These measurements, with the accompanying engraving, will, I think, give a fair idea of the flower and plant. The scent, although pleasant at first, brings on a violent head-ache if indulged in too freely, especially when sleeping under its influence. These plants seem very capricious, for we only found them in a few localities; but in these they grew in great abundance. Two other species of Mentzelia, *M. Wrightii*, Gray, and *M. nuda*, Nutt., were also night-blooming plants, and inhabited dry, rocky places; they were much more frequently met with than the above.

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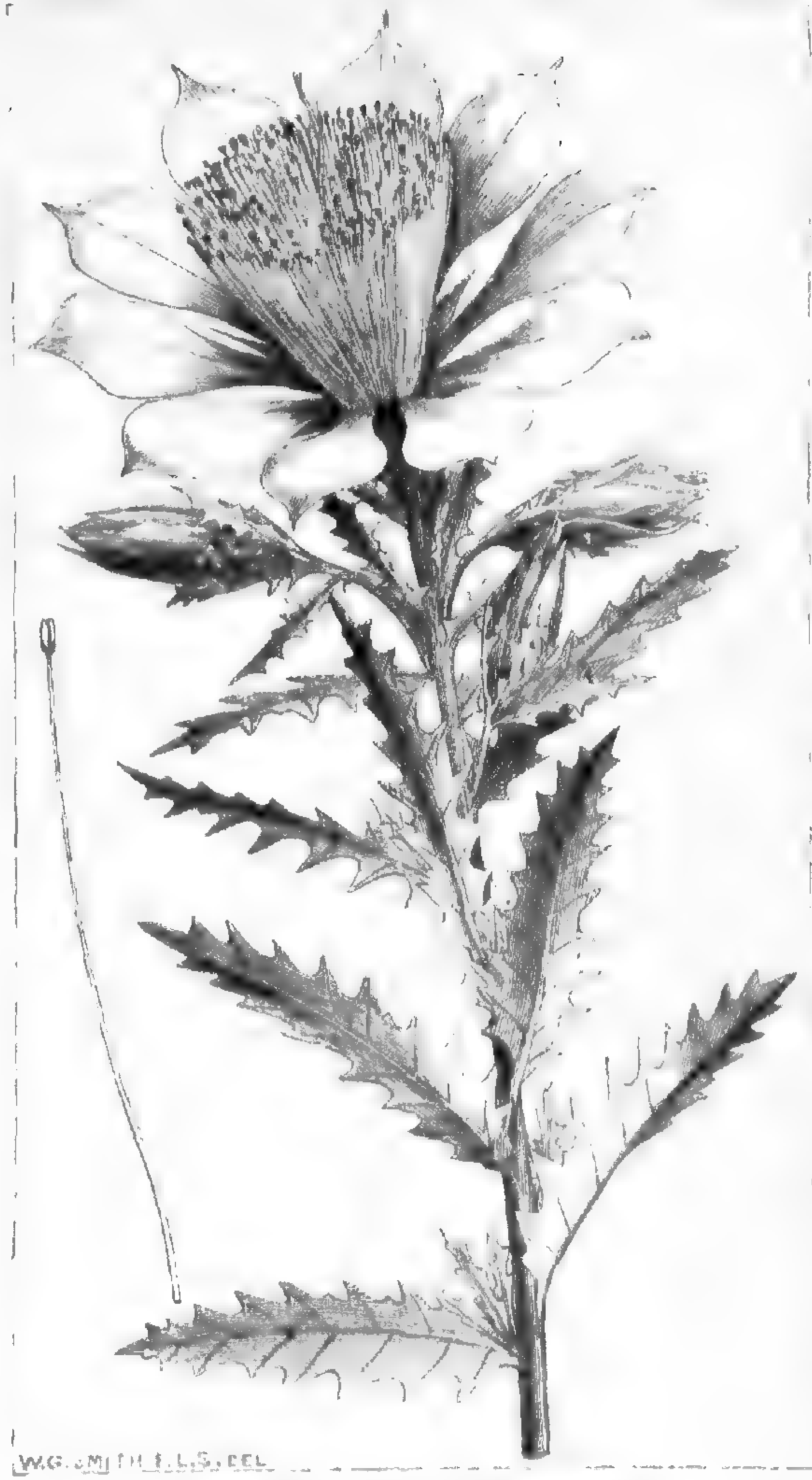
* The most prominent being called the Eagle's Nest.

August 17.

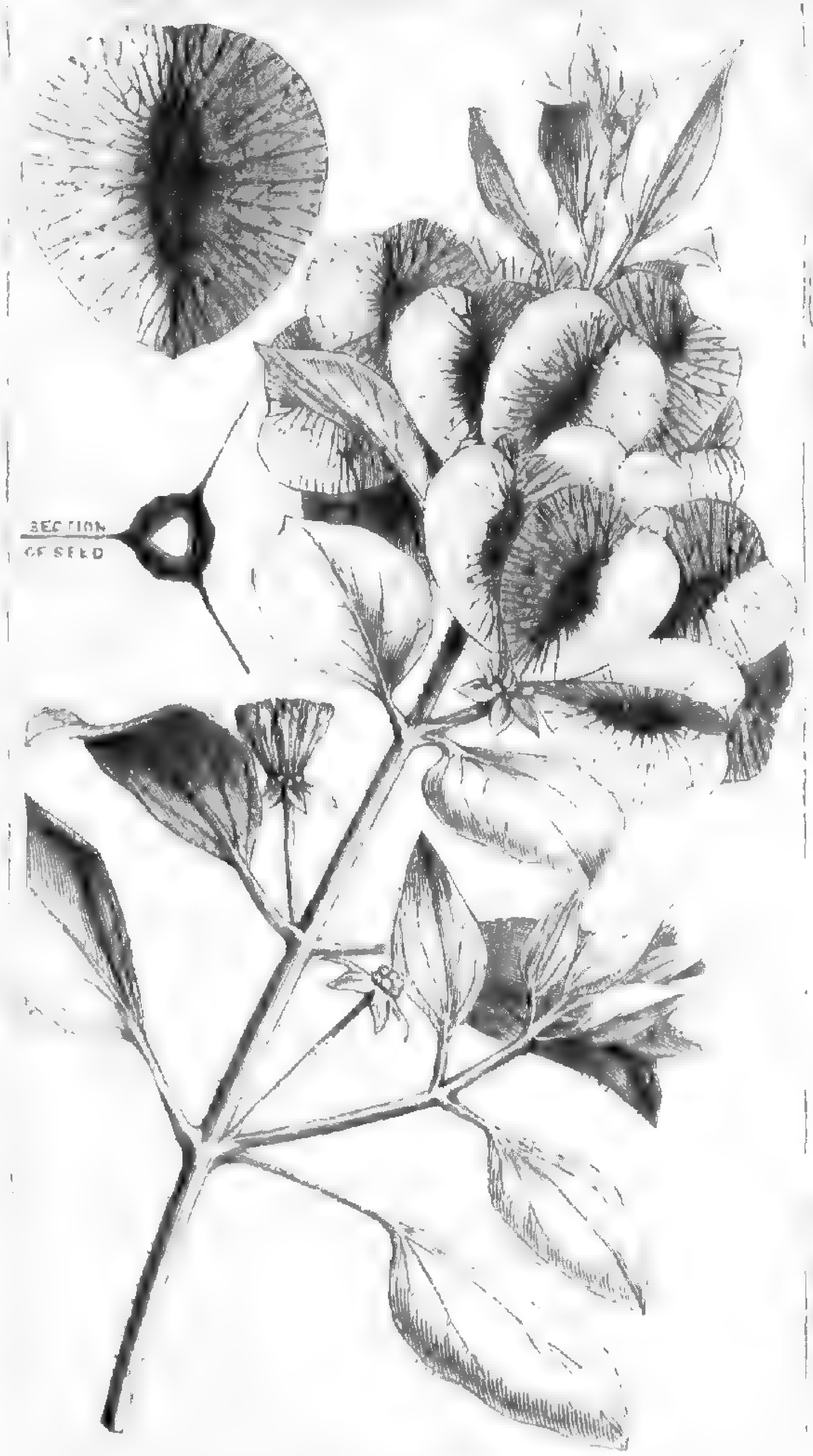
Next morning all were up and busy at sunrise, for General Wright had determined, without more delay, to send back Mr. Eicholtz and his division, to re-survey the line from the valley of the Purgatoire across the Raton Mountains to the head-waters of the Canadian. The soldiers of the escort were out of rations, and were starting for Maxwell's, a large hacienda guarded by a military post, and situated at the foot of the Rocky Mountains, about sixteen miles distant. Mr. Runk and his topographers might also be seen, with compass and rule, compiling the maps of the districts we had passed through; one would be reading out the results of the leveller, another computing the curves, a third sketching in the topography of the country adjacent to the

LOASACEÆ.

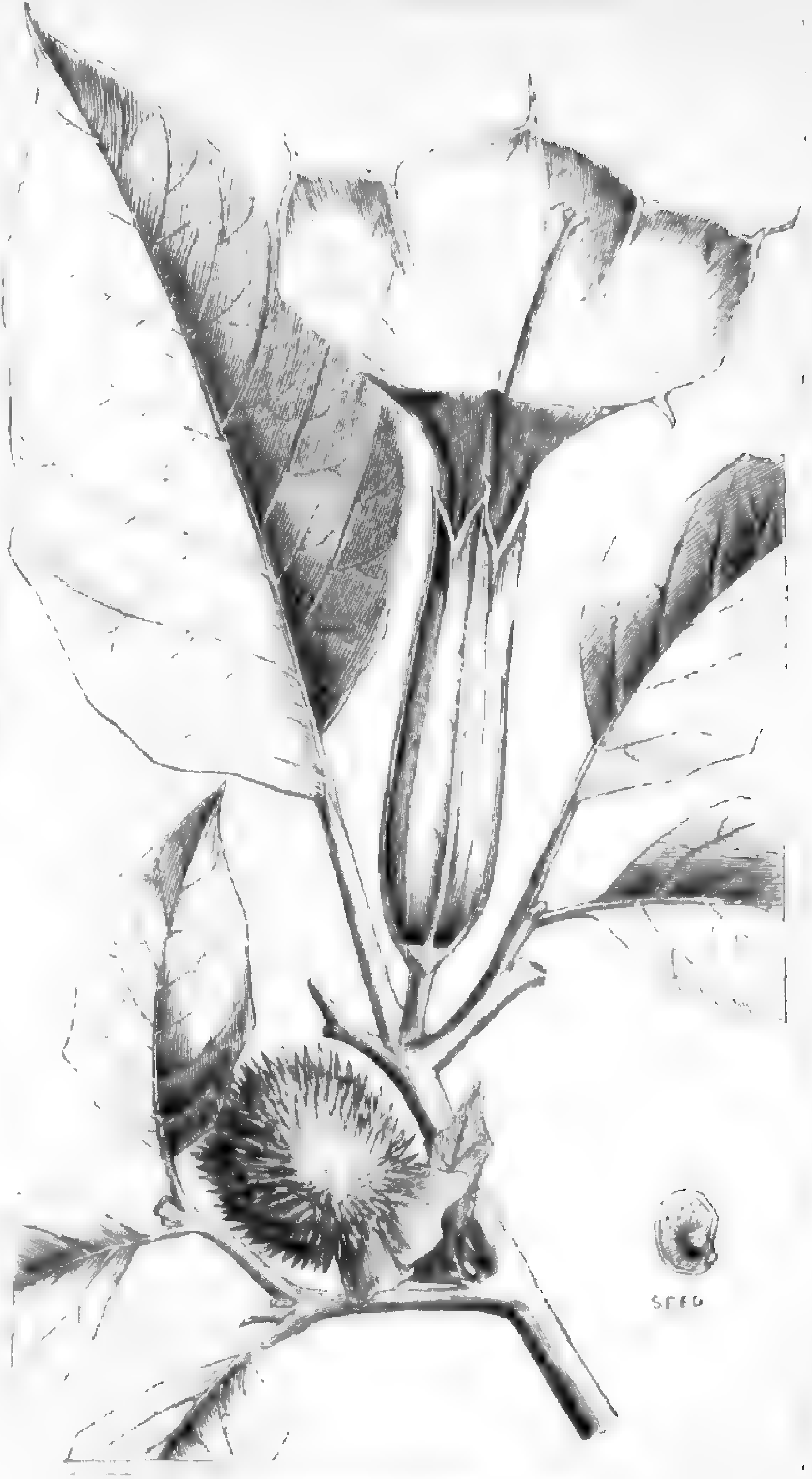

W.G. SMITH F.L.S. DEL.

MENTZELIA ORNATA, TORR.
(One-third natural size.)
Stamen natural size.

NYCTAGINACEÆ.


SECTION OF SEED

ABRONIA CYCLOPTERA, GRAY.
(Two-thirds natural size.)
Fruit natural size.



DATURA METELOIDES, DUNAL.
(One-third natural size.)
Seed natural size.

line of survey. And this was a sight very common in camp; but, alas! sometimes, after hours of toil, a gust of wind would come, upset the ink or paint-box, rip up the nearly-finished map from off the impromptu table, and oblige the unfortunate map-makers to begin all their work afresh. In some places flies or grasshoppers would insist on helping the draughtsmen. Some would spot the canvas here, there, and everywhere; while others, not content with this, would first jump into the indian ink and then draw maps of their own wherever they chanced to alight. At other times clouds of dust would cover everything, nor could any amount of pegging down keep the tent free from it. If I mistake not, Mr. Trap, our topographer, can tell how a frightened mule got entangled in the ropes and pulled the tent down over one of his best maps when almost completed. So that it was a matter of great congratulation when a map had passed through all the many perils and dangers to which it was exposed during its progress towards maturity and was at last safely consigned to the tin case.

Leaving the busy camp and the prairie lilies, let us ride with the escort and pay a visit to Mr. Maxwell at his haciendas, for he may well be considered the great man of this part of the country. He is by birth a French Canadian, and has been five-and-twenty years in this land of his adoption. By a Mexican marriage he became the possessor of a Spanish grant, sixty miles by thirty in extent, covering most of the land contained in the southern angle which the Raton make with the Rocky Mountains, and extending south almost to Fort Union. Instead, however, of spending his life in idleness, as a Mexican land-owner would have done, he set to work in earnest to develop as much as he could his rich domain. His house is beautifully situated on a fine stream, close to the point where it frees itself from the mountain gorges. It is built like a French villa, with an open court inside and a verandah, running the whole length of the building, covered by a projecting roof. Although made of adobe white-washed, it has the appearance of a modern brick building. Close to the house is the store or warehouse, well filled with everything necessary for a frontier man's life. Here the passing trader or traveller can buy what he pleases at a fair price. In the yard before the store many empty wagons were packed away, to be used when wanted. At the back of the house is a fine granary, several coralles, a farm-yard, sheep-pens, &c. Higher up the stream is a saw and flour mill, and, a few hundred yards down stream, the log huts of a little "one-company" military post, with stables, hay-stacks, and miniature parade ground, complete the establishment.

Far and near, on the hill-sides, many flocks and herds were visible, grazing, each under the charge of a Mexican or an Indian shepherd. In this magnificent climate the Mexican herdsman requires no hut or tent to cover him by day or night. With a little burro (a small breed of ass), on which he packs all his food and worldly possessions, he wanders about with his cattle, often for months at a time, all over the country.

Mr. Maxwell has been the first to introduce a fine breed of sheep into New Mexico from the States, and has conferred a great benefit on the country by so doing. Besides the raising of stock, he cultivates, I believe, about 2,000 acres of land by irrigation, from which he obtains very large crops of wheat, Indian corn, and other produce. He is also the Indian agent of the Mohuhaches, Utes, and Jacarilla Apache Indians; and has induced a large number of these wild sons of the mountains to settle on a reservation within his grant. These tribes were, until lately, most troublesome, and kept up constant hostilities with the settlers, especially the Mexicans; but gradually Mr. Maxwell has completely gained their confidence, and treats them more as children than dependants. At my first visit to his house, I found him sitting on the steps of his door in his shirt-sleeves, surrounded by a motley group of squaws, papooses, and warriors, painted up and decorated in their usual style. They all seemed on the most familiar terms with him—talking and laughing, while the children played around. These people were paying him a visit: they had just ridden in from the mountains, and had left their ponies tied under the trees.

In the coralle at the back of the house, I afterwards discovered the old hags of this party hard at work cutting up two sheep, which had been given to them as a present; and I can assure my readers that no manager of Drury Lane ever produced three more hideous or unearthly witches than were these half-naked, withered old creatures, their faces striped with red and white paint, their matted grey hair hanging from their huge heads over their sunken shoulders, their pendent shrivelled breasts, and their scraggy arms; while their eyes brightened and their huge mouths grinned with excitement as they plunged their claws amongst the entrails of the sheep, and scrambled for the tit-bits.

When the buffalo on the plains have got their winter coats, these Indians of the mountains are wont to unite their strength and make a raid into the lands of their more powerful neighbours, the Kiowas and the Arapahoes, in order to obtain flesh for the winter, and skins; and many a fierce struggle they have with these tribes. Often they are driven back with thinned ranks and empty hands, and with no means of support during the winter except the rations supplied to them by their agent; sometimes they return with fine robes and dried meat, as well as with trophies won from their neighbours. A few of these people can be taught to attend to cattle; but it is a hopeless task to try to teach them agricultural pursuits. The hatred of labour is in their blood, and it cannot be eradicated: their extinction therefore is only a matter of time.

The Utes tan hides better than any other tribe, so that buffalo-robes are the most valuable articles of trade amongst them. There was a good stock of robes at the store, from amongst which I selected one, which became my blanket throughout all my subsequent wanderings. There is nothing so necessary for a traveller in the Far West as a good buffalo-robe.

Besides the various interests of which Mr. Maxwell has, up to the present time, been the life and centre, another is now beginning to attract his attention—that of mining.

I watched him on the morning of my departure, while he panned out a little gold from the stream that dashed past his house. Some sixteen miles up that stream a few miners were already at work, earning fifty dollars a day by washing the yellow grains out from the sand. This was startling news for the proprietor of all the country around. He did not, however, ask them "what they meant by trespassing on his property;" but he welcomed them as friends—sent them timber from his saw-mill and sheep from his flocks.

At the very time that these rough prospectors from Colorado were disclosing to him the gold that lay hidden in the bed of the river which turned his mill, the geologist and the treasurer of our Railway Company came to examine the coal-fields over which his cattle were grazing.

As the vast deposits of tertiary coal which lie on the eastern slopes of the Rocky Mountains are now attracting much of the attention of those who have made the development of the Far West their especial study, I will give a brief outline of this important subject in a fresh chapter.

CHAPTER X.

THE COAL-FIELDS SITUATED ALONG THE EASTERN BASE OF THE ROCKY MOUNTAINS.

These Deposits are all of Tertiary Coal, or Lignite.—They cover an enormous Area.—Coal-fields near Denver.—Coal-fields beneath "Pineries," fifty miles farther South.—Those near Cañon City and about the Heads of the Huerfano River.—Croppings North of Raton Pass.—Large Deposits in Vermejo Cañon, and other gorges leading into the Valley of the Canadian River.—Deposits of Copper, Iron, Silver, and Lead Ores.—Valuable Gold-washings in the Taos District.—Rapid Growth of the Mining Region an earnest of future prosperity to New Mexico.

THE tertiary coal-fields of the Rocky Mountain system cover an area so great that it is quite impossible, from the partial examinations which have been made here and there along the slopes of the mountains, either to map out their limits or to come to any fair conclusion as to what are actually the richest localities. Not taking into consideration the country north of Denver, there are many fine coal veins to be found in the mountains west of that city.

Our geologist, Dr. Le Conte, visited two of the most important of those at present opened.

I. Murphy's, on Ralston Creek, twelve miles from Denver. This vein is 16 feet thick, and free from slate. The coal is sold at the pit's mouth for four dollars per ton (12*s.*), and is extensively used for fuel at Denver. It burns freely, with a luminous flame, and gave, on analysis—

Fixed carbon	55·31
Volatile matter	29·07
Water	11·7
Ash	3·92

II. Marshall's bed, on South Boulder Creek, twenty-three miles from Denver, is nearly horizontal. It exhibits 11 feet of solid coal, and is opened to a depth of 200 feet. On the authority of Mr. Marshall, the doctor states that the vein worked is the lowest of eleven, the thinnest being 5½ feet, while the nine others are each about the same thickness as the lowest—viz., 11 feet. These beds are separated by strata of from 25 to 60 feet of sandstone and lays.

Analysis.

Fixed carbon	59·2
Volatile matter	26·0
Water	12·0
Ash	2·8

These two specimens will suffice as examples from the vast coal deposits at the back of Denver, where enough mines are already "located" to supply the whole of Kansas for ages to come.

About fifty miles south of Denver, in the spur from he mountains, known, from its timbered sides, as "the Pineries," large deposits of coal are known to exist; but at the present time I cannot give any exact information about them. South-east of "the Pineries" there is coal on the Big Sandy. "A coal-pit is worked near Cañon City, in the hills south of the Arkansas, from which the blacksmith's forge at Fort Lyon has been supplied."

On the Cimarron Route Dr. Steck states that with Gen. Carleton, he saw on Rabbit Ear Creek, four miles below the wagon crossing, a large vein of coal, apparently 14 feet thick. Should this deposit, of which I have heard from other sources, prove satisfactory, it will go far to offset a serious drawback in the almost entire absence of timber along this route.

On the Huerfano Route, Dr. Parry reports that he met with no workable coal.

On the route by "Puntia Pass," coal quite equal, if not superior to that of the Vermejo, hereafter to be described, was seen by Col. Greenwood at Cañon City. It occurs in veins, from 4 to 10 feet thick, and the deposit extends at least twenty miles down the Arkansas Valley, below Cañon City This brings it to within ninety miles of Fort Lyon, or 204 miles from Sheridan, being the nearest certain supply o good coal to the present end of track that we know of The quality is admirable, and the quantity apparently inexhaustible. Major Calhoun, of our party, estimated the size of the deposit between Hard Scrabble and Cañon City to be one hundred square miles. In the Wet Mountain Park the deposits are represented as equally good.

Between the Arkansas and the Raton Mountains coal has been found amongst the heads of the Huerfano River, which, no doubt, is the northern continuation of the deposit better known south of those mountains. Some of the extensiv deposits exposed in the cañons, through which many of the heads of the Canadian River leave the mountains, were carefully examined by our geologist after he had visited those in the Raton Pass. I extract the following facts from his report. In Mr. Long's farm, on the Purgatoire, a vein, 3½ feet thick, of which 2½ are of good quality, was examined. In Raton Pass, one and a half miles beyond Trinidad, on the east of the road, several thin beds are exposed, varying from some inches to 3½ feet thick. Four and a half miles farther on, other similar croppings appeared, as also at the toll-gate and four miles south of it. Mr. Wooten, who lives at the toll-gate, mentioned several beds known to him, and conducted our geologist over the hills to visit a vein 8 feet hick, but did not succeed in taking him to the place. This eposit is stated to be in one of the most northern of the añons which debouch into Red River.

The largest deposit yet discovered in these cañons is in ermejo Cañon, between twenty-five and thirty miles south f Raton Pass. The high road runs within eight miles of e mines, from which the government workshops at Fort nion and the haciendas, as far as that point, are supplied.

On August 19th, Dr. Le Conte, accompanied by General almer and Captain Colton, visited them, and gives the llowing description:—

“After riding five miles up the valley of the Vermejo, by regular and gradual ascent, we entered a cañon on the orth side of the stream. We followed this cañon two nd a half miles, to a coal bank, which is on the east side, bout 25 or 30 feet above the bottom of the cliff. It ows 10 feet of good coal, in two beds of 5 feet each, parated by 10 inches of slate. Following the cañon above d below the bed, I obtained the following section, in which e thickness of the strata is estimated by the eye, except here contiguous to the coal-beds:—

	Ft.	In.
Sandstone from top of hill about	800	0
Clay	5	0
Sandstone with ferruginous beds	20	0
Coal (partly poor) and shales	10	0
Sandstone	5	0
Calcareous clay (grey)	4	0
Ferruginous clay	2	0
Sandstone	20	0
Coal (partly poor) and shales	15	0
Sandstone, laminated	20	0
Sandstone not laminated, massive	8	0
Shale	3	0
Ferruginous clay, indurated	1	0
Shale, slate, and clay, more carbonaceous below	25	0
Coal, (good)	5	0
Slate	0	10

	.	In .
Coal, (good)	5	0
Shales	4	0
Ferruginous sandstone	3	0
Massive sandstone	20	0
Sandstone, more or less clayey, occasionally with well-marked vertical cleavage	80	0
Slates	20	0
Sandstone to bottom of rock exposure.		

The same bed, less perfectly exposed, is seen on the west side of the cañon, about half a mile above; near it are beds of a heavy dark grey stone, containing, according to an analysis by Messrs. Williams and Moss, 22 per cent. of iron.

"Carbonaceous shales are exposed in the main valley near the cañon. Returning from the coal bank to the main valley, we ascended it about three miles. It became gradually narrower, and at length was merely a cañon, trending north-west. We saw in it several exposures of coal, which had been imperfectly opened; but, as far as I could judge from the appearance of the contiguous beds of sandstone, they were parts of the same bank which I have described above. Iron ore, and large quantities of silicified wood of exogenous growth, occur at this place. Similar beds are said to be exposed in other cañons of this valley; and I afterwards learned from Mr. Maxwell that he had seen them also many miles above, in the main valley. Time was pressing, and we reluctantly postponed further examinations till another occasion.

"August 20th, Captain Colton visited the coal-bank in Blackmore Cañon, one of the north-eastern branches of the Vermejo. He procured specimens of the coal—which is of excellent quality—and kindly furnished me with the following section of the strata near the bed:—

	Ft.	In.
Sandstone	7	0
Slate	1	0
Sandstone and clay	2	0

	Ft.	In.
Sandstone, laminated	9	0
Slate	2	0
Coal	1	0
Slate	1	0
Sandstone, laminated	5	0
Slaty clay	8	0
Sandstone	2	0
Slate	10	0
Ferruginous sandstone	2	6
Slaty clay	5	0
Ferruginous sandstone	2	0
Slate	12	0
Sandstone with ferruginous strata	30	0
Slaty clay	1	6
Coal (10 feet only exposed)	12	0

Sandstone to bottom of cañon.

"While Captain Colton was visiting the Blackmore bank, which is only four miles from Vermejo Station, General Palmer and myself, under the guidance of Mr. O'Donnell, were exploring Bremer Cañon, the one immediately south of he Vermejo Valley. Five miles west of the stage road, we aw several exposures, mostly obscured by land-slips. The est of them showed 4 feet of good coal; another, of probably he same bed, showed 3 feet. These beds seem to be a conti-uation of those observed in the Vermejo cañons. Continuing ur journey, we arrived at the hospitable residence of Mr. Maxwell about three o'clock in the afternoon."

Analysis of Vermejo Cañon Coal.

Fixed carbon	59·72
Volatile matter	27·73
Water	3·27
Ash	13·28

"The coal of Cañon City," says Dr. Le Conte, in another part of his report, "is so similar in appearance and situation to the beds I examined in the Vermejo Valley, that I have no doubt that it belongs to the same series, and that the strata of the formation lie uninterruptedly along the base of the mountains, from the Arkansas to Maxwell's, and fill up the broa valley which would otherwise remain between the basalts o the Raton and the much older metamorphic rocks of th Rocky Mountains. The very thick formation of sandston containing the coal-beds described, ceases to skirt the fo hills of the mountain chain below Maxwell's, and reappea no more in our southern progress.

"The metamorphic ridges of the Rocky Mountains approac more nearly to the plain, and, so far as they have bee explored, give evidence that they are as much loaded wit mineral wealth here as in the regions north of the Arkansa Eighteen miles west of Maxwell's a valuable copper min has been discovered, and has been well opened for futur development. Specimens given me contain silicate, green an blue carbonates, and sulphurets of copper, making a ver rich ore. Good specimens of argentiferous galina and iron o were also presented to me, but without note of the precis locality.

"Valuable placer washings of gold have recently been foun in the same mountain ridge, which is the water-shed betwee the Little Cimarron and the Moro on the east, and the valle of Taos on the west. The excitement regarding the gold wa becoming greater from week to week; and the last repor that reached me, on my return by stage, was, that a party o five men from Colorado had taken out 1,200 dollars in one day."

This gold-field is now known as the Taos district, and contained within one year after its discovery on the estates o Mr. Maxwell in the spring of 1867, 3,000 miners. These miners have already formed a town, which in their confidence they have been pleased to name "Virginia City." It is worth while to note that this is the first rush of American gold-seekers, in large numbers, to any district in New Mexico, and that it has come from the north-east. We shall see abundant signs farther south of similar and more extensive invasions; but these have come from the south-west. The miners have been Spaniards; and nothing now remains to tell of their existence but acres upon acres of earth undermined and honeycombed in every direction.

Let us hope that the success of this gold-field will mark the commencement of a long reign of prosperity to New Mexico, under Anglo-Saxon rule.

CHAPTER XI.

FORT UNION.

Position of the Line surveyed, from the Raton Mountains to Los Vegas.—The Rivers and Mountains passed on the way.—A Ride over Turkey Mountain.—Fort Union.—Kitty stolen.—Krönig's Farm.—Leave Fort Union.—Los Vegas.—Our Reception by the Citizens.—A Mexican *Baile* (Ball).—The Hot Springs of Vegas.—General Palmer, Captain Colton, and myself, proceed independently to Santa Fé.

Distances:—From Raton Mountains to Red River, 64 miles; from Red River to Los Vegas, 76 miles. Total, 140 miles.

FROM the Raton Mountains to the town of Los Vegas, the line surveyed by our party lies at a distance varying from twenty to thirty miles east of the foot of the Rocky Mountains, thus avoiding the spurs which jut out from them into the plain. It passes six miles to the east of Fort Union, and does not strike the foot of the main chain until reaching Los Vegas. The Santa Fé road, however, keeps quite near the mountains for nearly the whole distance from Raton Pass to Los Vegas. Both the road and our line of survey cross in this distance numerous streams, the heads of the Canadian—such as Red River, Rio Vermejo, Peñejo, or Ponaro, Little Cimarron, Ocate, Rio Moro, and at Vegas the Gallinas—the waters of which streams can be used with the greatest profit by settlers to irrigate the valleys through which they flow. It is far easier for the settler to dig irrigating ditches around the plot of land he has selected, than to clear a farm in a timbered country; and when once he has completed this, his first task, he can ever afterwards reap the benefits of a crop far more abundant and more certain than any that can be raised in lands which are watered only by the rain-fall. In the most populous country in the world (China) nearly all agriculture is carried on by means of irrigation.

Fort Union is distant from Maxwell's by the road fifty-two miles; from the point where our line of survey crossed Red River, fifty-six miles. The country is for the most part a vast grass-covered plain, drained by the Red River. We are never, however, out of sight of mountains, some of which are isolated, and rise out of the plain with grotesque outlines, such as Wagon Mountain, shaped exactly like a huge wagon drawn by a pair of horses. Most of them partake of the mesa formation, as Mesa Apache; while others form ranges jutting out from the Rocky Mountains, as the Cimarron range, behind which are raised in stately grandeur the snow-capped summits of the main chain. The most beautiful, however, is Turkey Mountain, which sends up its three lofty and graceful peaks exactly in a direct line to Fort Union from the north-east.

August 21.

Being on horseback, I took the mountain road to the fort on the 21st of August, and had one of the most romantic rides I can remember in all my wanderings. The partly volcanic nature of the rocks, together with the abundance of water, gave a fertility and freshness to the whole landscape, which contrasted most delightfully with the monotonous plains. Rich grassy parks, studded with noble trees, and watered by an abundance of rivulets, were hemmed in by glorious turrets of rock, and overshadowed by the pine-clad summits of the peaks, which, with the art of nature, broke the oppressive regularity of the sky-line.

For twenty miles I wound my way through this beautiful country, yet all seemed given over entirely to nature, and there was not the trace of a human being except the path upon which I rode. No flocks or herds cropped the tender grass. I looked in vain amongst the trees and up the valleys which opened into the pass, now on one side and then on the other, but there was no shepherd, no hut, no farm to be seen; the wild turkeys had all been either shot or driven away by the officers from Fort Union; and the same might be said of the deer; but with this exception—the absence of game—nature remained exactly as God had made it.

Fort Union is a bustling place; it is the largest military establishment to be found on the plains, and is the supply centre from which the forty or fifty lesser forts scattered all over the country within a radius of 500 miles or more, are supplied with men, horses, munitions of war, and often with everything needed for their support. It is not in the least fortified, as of course, such a precaution would be useless; but it is a vast collection of workshops, storehouses, barracks, officers' quarters, and offices of all kinds belonging to the different departments. The dwellings, although built, as are all the other buildings, of sun-dried bricks, are most comfortable. They are roofed with thin iron sheeting, covered with earth. The rooms of the officers are lofty and well-furnished. The hospital, containing about 120 beds, is a very fine building, to which two resident surgeons are attached. A large settler's store must not be forgotten, at which the daily sales average 3,000 dollars. Over 1,000 workmen are here kept constantly employed, building and repairing wagons, gathering in and distributing supplies, making harness, putting up buildings, and attending to the long trains of goods and supplies constantly arriving and departing. When we think for a moment of the hundreds of miles that everything has to be brought by a slow and expensive mode of conveyance—600 miles by wagon from the end of the railway, and nearly 1,500 by rail from St. Louis; when we consider the price of labour; when, in fact, we view the economic aspect of affairs, even a traveller cannot help being amazed at the enormous expenditure of money necessary to maintain so large an establishment in such a locality. The millions of dollars which are yearly absorbed by such a place as Fort Union must be something marvellous; and the opportunities for peculation and growing fat by the misappliance of public moneys, by exorbitant charges if not by actual fraud, are probably greater here than in any other branch of the public service.

We pitched our camp a few hundred yards from the fort, and remained here a week for repairs. Before dawn, on the third morning after our arrival, my chestnut mare, Kitty, was "run off" from the centre of our encampment, where she had been picketed the evening before. Neither a large reward, nor a long day spent in scouring the country round, gave us the slightest clue to the direction taken by the thief.

The post commander had become resigned to the state of things, which enabled gangs of horse-thieves to carry on their depredations almost with impunity. Scarcely a week passed without some one or more horses being successfully stolen from the government coralles, and carried off into the wild country, where it was impossible to trace them. And, in fact, the very week after I had applied in vain for assistance at the Fort to track the thief who had robbed me of a mare —I was very much attached to my brave old Kitty—no less than five horses were actually taken out of the very stables of the officers, and successfully made away with.

About six miles south of Fort Union is situated what even in a civilized country might be called a model farm, which proves more conclusively than volumes of argument the worth of these regions for agriculture. Mr. Krönig, the owner of this farm, came to the conclusion from his own observation, that the rain-fall along the base of the mountains was quite sufficient to supply artificial reservoirs from which tracts of land could be successfully irrigated. Notwithstanding the chance of such an experiment turning out a costly failure, he set to work, and has formed on the open plain two or three lakes, or reservoirs, from which he now irrigates 2,500 acres of land. I bathed in one of these lakes in passing; went over a fine house he is building near it, and saw with pleasure the groves and avenues of young trees which he had planted, all thriving beautifully. The yield last year was an average one of thirty-five bushels of maize, forty of wheat, and fifty of oats to the acre. He is now a rich man, and hopes soon to have another lake, and several hundred acres more land, in good working order. He also states that he feels convinced, that the rain-fall has increased since he commenced to irrigate and form the lakes. The success of this experiment is of infinite importance to the emigrant.

August 29.

On August 29th, we bid good-bye to Fort Union, and proceeded to Los Vegas, distant twenty-six miles, the first Mexican town our line of survey had yet encountered. The situation of this thriving little town of 5,000 inhabitants, at the gate of the mountains has made it, within the last few years, the seat of a very flourishing trade, and the abode of many energetic merchants, Americans as well as Mexicans; so that when the people of the place heard that "El cameno de fiero caril" (the road of the iron wagon) was actually going to pass through their town, they called a meeting and determined to give our party a hearty welcome. As we approached the town a party of about thirty, consisting of the chief men of the place, came out to meet us, mounted on horses caparisoned with the picturesque and gaudy trappings peculiar to the Mexicans.

In the rear came a close carriage, within which a large silver urn occupied the place of honour, and tankards in abundance were placed around it. General Wright and all received a hearty welcome; we were invited to consider the hotel at our disposal free of charge as long as we remained, and we drank the health of each other, and success to the railway, in the refreshing beverages our hosts had brought for us.

Los Vegas is 6,452 feet above the level of the sea, and very nearly the same altitude as the divide between the waters of the Pecos which flow into the Rio Grande, and those of the Canadian which feed the Mississippi. This divide was crossed imperceptibly at a nominal grade between Fort Union and Los Vegas. From the latter place the line surveyed descends 727 feet in twenty-six miles, to the point where it crosses the Pecos River. Then commences an ascent of thirty miles to Filley's summit, at the head of Cañon Blanco, elevation 7,136 feet, the highest point attained east of the Rio Grande, and higher than any other crossed on the 32nd parallel along the entire distance to the Pacific. Between Filley's summit and Isletta on the Rio Grande, a distance of sixty miles, the line surveyed descends 2,084 feet.

The town of Los Vegas is built of adobe; it has a good-sized plaza in the centre, a most comfortable hotel, many well-filled storehouses and shops, and two dancing saloons, where Mexican *bailes*, or *fandangos*, as they are sometimes called, are carried on almost every night. The love of the people for dancing is almost insatiable, and they certainly indulge in it to their hearts' content. It is a common sight in most of the towns of New Mexico to see the fiddler and an attendant drummer-boy going the rounds at sunset, playing some favourite valse, to announce to all that there will be a dance that night. By nine o'clock (for they are very late for country folk), all assemble in the ball-room, the fiddler tunes up, and, without introduction, each man leads out his partner to the dance. It is a curious fact, that the *baile* (pronounced bilie), which is quite a national institution in every Mexican village under the jurisdiction of the United States, is now far less common even in the larger towns across the frontier in Mexico Proper. I was much struck with the absence of gaiety in the same people, when crushed by the tyranny of the so-called Republic of Mexico, although in personal appearance both men and women had greatly the advantage of their more northern brethren.

Four miles and a half from Los Vegas, beautifully situated in a romantic valley up in the pine regions, are the hot sulphur springs of Vegas. These have been long celebrated for their curative qualities in diseases which are very common amongst the Mexican population all through New Mexico, and they are much frequented, although the accommodation is very limited and poor. Besides the water of the hot springs,—temperature 160° Fahr.,—which is most powerfully sulphurous, an abundance of the purest cold water flows down from the mountain, so that there is every prospect of this spot becoming a thriving watering-place as soon as the railway can convey the health-seekers and pleasure-hunters from the large towns of the States thither, to take a summer's pleasuring in the dry pure air of the Rocky Mountains. The springs are 7,500 feet above the sea-level—a much higher elevation than the famous hot springs at Leukerbad, in Switzerland. It would be impossible to exaggerate the magnificence of the climate in these upland regions of New Mexico. I may add that there are to be found, two or three miles above the spring, quantities of very fine specular iron ore. The pieces I examined were very strongly magnetic, and emarkable for their purity.* Coal is also found near these prings, as well as in a bed near Agua Zarca, whence it has een carried six miles for use at Vegas.

Having now reached a district where hostile Indians were o longer to be feared, General Palmer, wishing to see as much the country as possible, and being tired of the necessarily ow advance of the surveyors, determined to go on to Santa Sept. 2. Fé independently. So the 2nd of September found us—Palmer, Colton and myself, with a ery intelligent Mexican guide, Escobal, and one servant—ending our way through the beautifully wooded valleys and cturesque gorges which gradually slope down to the Rio Pecos. ehind followed our humble wagon carrying our luggage d provisions, and drawn by two weedy Mexican mules. A oor crippled Mexican as driver, who had at one time barely caped from the Indians with his life, completed the "outfit" f the best we could get at Los Vegas, but one which broke own, as might have been expected, at the first difficulty we countered. We carried no tents; Palmer, Colton and the uide were on horseback, I had to content myself with a le, an animal by no means to be despised in the Far West ovided he be a good one. Our spirits were high and our arts light as we felt the freedom of travelling quite inde- ndently, and we watched with all the interest which the eat object of our trip inspired, the general features of the autiful country as they opened before us at every step.

A glance at the map will show that the course taken by us passes around the southern extremity of the great mass o mountains which, running northward, form the eastern mai chain of the Rocky Mountains. This southern extremit may be considered to be about sixty miles broad; it i drained on the south and south-east by the heads of th Pecos, and on the west and south-west by the Santa Fé an Galisteo branches of the Rio Grande.

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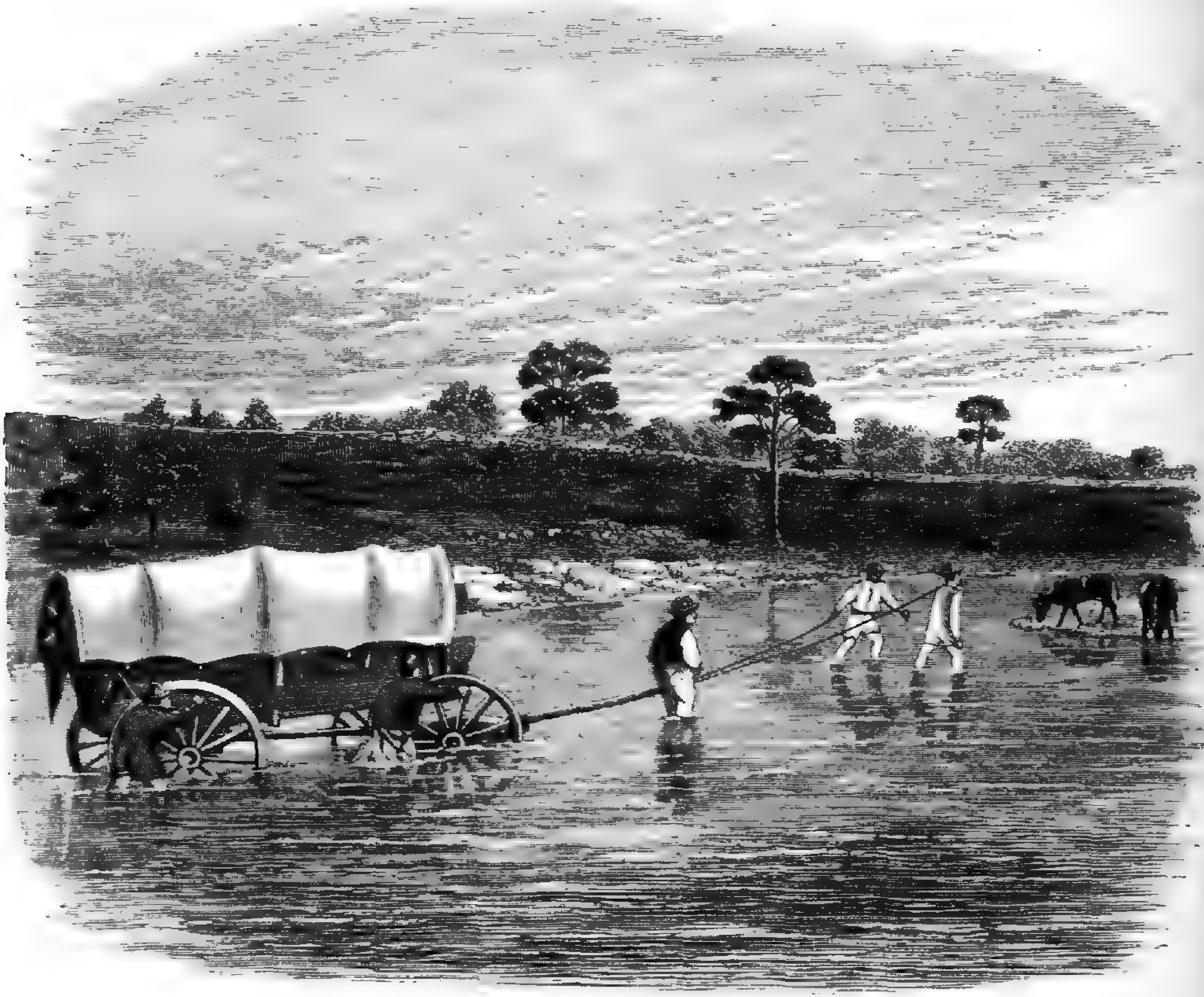
* About one and a half miles west of the hot springs there are two nearly rtical beds of iron ore, the eastern one is a stratified mixture of quartz and agnetic oxide, 4 feet thick, and bearing north 70° east, with a dip of about ° to the south and east. One hundred yards north of this bed is a granite d with red felspar, 6 feet wide, carrying much specular iron, which is slightly niferous. A shaft was sunk 14 feet upon it by Mr. Erminger in pursuit of her metals.

As we wound about, following the course of the litt valleys, and crossing the lowest parts of the ridges betwee them, we remained nearly always at an elevation of fro 6,000 to 7,000 feet. Although we were nominally in th mountains, the reader must not imagine that our route la amongst Alpine scenery, with great peaks towering up t the sky, and lofty ranges forbidding our advance. Th ranges or sierras, on the contrary, are here short and irregula spurs from the main chain of mountains, and not mountain themselves: they have disturbed the overlying strata which in the form of mesas,—flat-topped masses of sedimentar rocks,—cover most of the country, and add much grotesqu beauty to the landscape. Sometimes their walls are of gre sandstone, at other times of deep red. They are oft much variegated with masses of blue clay, and many a capped with an outflow of pillared basalt. In some plac we look down over a district which seems to have sunk to low level, containing its own mesas, of different colours, an bounded by the walls of higher ones on either side. Th eastern slopes, of all the irregularities, whether they be sierr or mesas, are always more gradual than the western, an are generally more thickly covered with vegetation. Probably both facts arise from the same cause—a greater averag rain-fall.

Frequently we passed through very fine bodies of pin timber, and everywhere the piñon or nut-pine (*Pinus edulis*) grew in the greatest abundance. This species is said to bear ruit only once every seven years. If such be the case, then 867 was the great harvest year, for the nuts were most bundant. The cone of a piñon tree much resembles that of n ordinary fir; but when ripe it opens, and discloses at the ase of each scale a brown nut, about the size of a plum-one, with a thin shell, and a plump delicious little kernel. he Mexicans believe the year of nut-harvest to be a very ucky one; they expect an unusual increase to their flocks nd their families, and consider that those who are married, s well as those who are born during nutting-time, will have he best of good fortune in after life.

We found the country studded here and there with a umber of Mexican villages, nineteen of which were within distance of twenty miles from the proposed line of railway. he largest are Anton Chico and San Miguel, each numbering bout 1,000 inhabitants; the smallest is Cuesta, containing bout fifty families. The people raise sheep, horned cattle, ules, maize, beans, onions, red pepper, melons, &c., and in any places the crops are grown without irrigation. For any years they have been but little troubled by Indians; ut on the 3rd of November, 1865, the wild tribe, known the Mescalero Apaches, who had been induced to settle on reservation at Fort Sumner, 100 miles south-east of nton Chico, left in a body, and have continued from that me to roam about in search of booty, spreading terror and onfusion amongst the unprotected Mexicans, robbing them f their flocks, and often murdering them if they resisted.

Early in the morning of the third day after our departure rom Los Vegas we reached the Rio Pecos, at the Billiamante crossing. Here our "outfit" stuck fast in the middle of the stream. In vain we belaboured the unwilling mules, in vain we tried to make our riding horses draw; afte hours spent in such useless efforts, we emptied the wagon and carried each piece of luggage across the rapid river, with th water above our waists; then we put ourselves in the harnes and dragged the wagon through. When I say *we*, I includ myself; but I did not become a beast of burden, scien saving me from that degradation. While my companion bereft of all garments save their shirts, were tugging manfully at the ropes, I was fulfilling a contract I had jus made—that if I took a photograph of their manly forms, the would dispense if possible with my assistance. Here is th result.



The "Outfit" in Difficulties.

Camping on the opposite bank for the night, we sent bac

o the main party next morning for a pair of strong mules,
nd occupied the next two days as best we could, by examin-
ng the country up and down the river. The Pecos Valley is
ltivated from Anton Chico (twelve miles below our crossing)
Fort Sumner, and in many open places, almost to its source,
herever there is good bottom-land easily irrigated; but below
rt Sumner the larger proportion of the stream is shut up
cañons as it passes through the sterile regions of the
lano Estacado. In the evening a Mexican brought us some
ne large water-melons, onions, eggs, and fowls from his
rm, two miles off; and told us that a body of fifty mounted
avajos (probably Mescalero Apaches) had made a raid on
uesta, seven miles distant, three days ago, and succeeded in
iving off some stock. We, therefore, kept a strict watch
our animals, and suffered no harm.

Next evening a well-known voice and a splash in the
ater announced the return of Colton with a fine fat mule,
d a miserable, half-starved, shoeless, chestnut mare, both
rnessed. "What," I cried out, "have you brought us
at for?" "Well, you're a pretty fellow, not to know your
n horse!" said my worthy friend, as he jumped from his
ddle. And sure enough it was Kitty back again, but so
tered from her fortnight's ill usage, that it was, indeed,
rd to recognise her, reduced to a skeleton, and covered with
st and harness. The thief, a Mexican, had taken off her
oes for fear of being tracked, and had "run" her fifty
iles from Fort Union to his farm in the wilds. But one of
r surveying parties, while examining the country, happened
pass the very place where she was grazing. Seeing so
uch that was familiar to her in better days she came up,
eighing, to her friends and was quickly recognised by Mr.
unk.

Close to the stream I found a very large species of Datura, which, I believe, is a native of Northern and New Mexico only—*Datura meteloides.* The flower looks at first sight like a huge convolvulus, whose corolla is eight inches in length from base to margin, and often five or six inches in diameter when fully expanded. (See Plate, p. 106.)

The seed-vessels look like balls covered with long spines; the plant attains a height of five feet, and has an unpleasant odour, but the flowers are agreeably scented.*

Next morning we started afresh, in better form, with four mules to our wagon, and did not again come to grief between the Pecos crossing and Santa Fé.

A long day's ride brought us, towards sunset, out of the wooded district upon the vast plain which forms the summit of the divide between the Pecos and Rio Grande. We passed rapidly on in the hopes of finding some lagunas, the only reliable water-holes within many miles on this lofty table-land; but were obliged at last to give up the search, to stop for the night, and to let loose our thirsty animals, to get on as best they might. They were very restless, however, and soon made off on an independent scout. We followed in considerable fear, lest they had made up their minds to return to the last drinking-place, some twenty miles in the rear; but to our infinite surprise, after a three miles' run, they stopped suddenly at a little rich green patch, which turned out to be a good water-hole some ten feet square. Horses and mules, if left to themselves, will often find water for the traveller when he has failed, but there is always the great risk of their quietly trotting back to the

Sunday, Sept. 7.

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* As some discussion has taken place as to the identity of this New Mexican plant and De Candolle's, I may add that the calyx in my specimen is 10-dentate, whereas Gray describes it as 5-dentate. See note, page 154, in "Mexican Boundary Survey," vol. ii. This plant is No. 5 in my collection.

ast watering-place, should they be unsuccessful in their earch.

Sept. 8.

Next morning we advanced due west, not towards Santa é, but towards the Placer Mountains, a district of very considerable interest, from the great mineral wealth it contained. As we crossed the table-land, chain of mountains on the north came into view; these ere the southern extremities of the Santa Fé Mountains, which e to the east of that town, and are continuous with the main hain to the north of them. To the north-west, the country ing between these mountains and the Placers appeared to rm one of those huge "faults," or depressions already menioned, over which our eyes wandered with awe, if not with dmiration. Nothing could surpass the disordered grandeur f that barren region. It looked perfectly unearthly—a aste of crags and cañons, deep-red cliffs, and precipices hose sides were striped with rocks of every hue, yet all earing the same appearance of having been burned up in ome fierce furnace. It seemed as if, having left purgatory ehind, we had at last come to the gate of hell. The wag f our party remarked that here the devil must have frizzled ll the Christians in the land, so that it was no wonder we so eldom came across any.

This country is drained by the Galisteo, and most of its ild arid confusion is due to erosion. Straight before us, as e travelled to the west, rose the three first well-timbered ills of the Placer Mountains; behind, stretched out the arger melon-shaped mass, the Zandia; and, far to the southward, the detached range of the Manzana (oak) Mountain terminated our field of vision. Now these detached mountains, and others south of them, which separate the valley of the Rio Grande from the barren table-lands at their back, are most distinctly separated, both in appearance and geological formation, from the more northern chains of the Rocky Mountains. Between the former, roads, or rather trails, lead down to the Rio Grande. The road between the Placer Mountains and the Rocky Mountains follows the valley of the Galisteo; another between the Zandia and the Manzana, is called Tijeras Cañon; and a third, some fifty miles farther south, is known as the Abo Pass. The last two passes were surveyed, each by one of our parties, who reached them by different routes from Los Vegas. The Abo route was found to be a most beautiful line for a railroad, along the 32nd parallel, but that in Cañon Blanco and Tijeras did not prove so good, as the descent required nearly the maximum grade of 116 feet per mile for about twenty miles. The Galisteo route was not then examined.

On leaving Santa Fé for the south, Captain Colton and myself made a reconnaissance of this route, and thought it looked a very favourable one. It has since been surveyed by a return party with very satisfactory results, proving that the Rio Grande can be reached about the 35th parallel, without having recourse at any point to the maximum grade sanctioned by Congress. Curious to relate, there is coal in each of the passes here mentioned.

Having crossed the level grass-covered plain, a nine miles' ride through the piñon groves between the Placer Mountains brought us to a little mining village, the Real de San Francisco. We spent the whole week in examining the mines of this wonderful little district, about which, at the risk of tiring my readers, I must say a few words in a fresh chapter.

CHAPTER XII.

THE PLACER MOUNTAINS.

panish Grants.—Placer Gold Mining.—The New Placers.—The Mines deserted, and many of them stopped up.—Scarcity of Water a great Drawback.—A fine Pine Forest.—New Mexico Mining Company.—The Old Placers.—Iron and Limestone abundant.—Copper, Silver, and Lead Ores.—Anthracite Coal.—Great Cost of Transportation to the Mines.—When a Railway reaches this region, extensive Iron Works will probably be established here.

Distance:—Los Vegas to Santa Fé, 70 miles.

THE greater part of the Placer Mountains is covered by two Spanish grants. The San Pedro, containing 40,000 acres, has or its centre the Real de San Francisco, and contains within it hose extensive landslips which, as early as the year 1776, were worked as placer diggings by the Spanish miners and heir slaves. This grant now belongs to three or four mericans, who, although possessed of so valuable a property, ave no capital at their disposal to turn their wealth to ccount. The other grant is owned by a company, "The New Mexico Mining Company," and is ten miles square. Upon this property, as in the former case, one mountain specially, known as "Gold Mountain," has, during the lapse of time, been worn down by the action of the elements and by the attrition of rocks detached from the summit, so that an inclined plane, or "talus" of débris, has been formed at its base, in which large quantities of gold, the products of the disintegrated quartz veins which traverse the mountain itself, have collected. During the Spanish occupation the gold washers, or "placer miners," worked here with great profit, and have given their name to this district also.

The former is called the New Placers, the latter the Old. The one is about thirty-five and the other twenty-seven miles distant from Santa Fé. It was only natural, when the rich surface pickings had been exhausted, and placer mining had become less remunerative from the necessity of being obliged to dig down deeper for the gold, that the miners should search in the rocks above for the veins from which the golden débris came. This is, in short, the origin of quartz mining.

The only two Americans living on the San Pedro grant or New Placers were, at the time of our visit, a Mr. Hutchinson and a Mr. Cooley, who received us most hospitably at the little village—the Real de San Francisco—and, during our sojourn there, gave us every facility for seeing as much as possible of the country and its riches. Within a radius of ten miles we visited several old mines in which the early Spaniards had expended enormous labour. Most of the mines had been stopped up by the Indians to prevent their subsequent discovery after the peons had succeeded in driving their masters from the country. The greater number were of auriferous quartz; one, reputed to be very rich, led through a very thick vein of auriferous copper ore; three mines in the Zandia Mountain, two of which had been much worked, were of argentiferous galena; another, which had been most skilfully stopped, was only lately discovered, and appeared to ramify very extensively through a horizontal vein of decomposed auriferous quartz. We also visited some new mines opened by our hosts. They were working them in a very small way, being obliged to cart the ore some distance, either to a rude horse *arastra* two miles and a half off, or to a stamp-mill thrice that distance. Yet the ore was wonderfully rich, a specimen examined for our geologist yielding 738·86 dollars gold and 7·50 dollars silver o the ton, while a cartload which we saw ourselves passed hrough the mill yielded 60 dollars, the average of the whole ield being 45 dollars per ton. This was from the Candalaria Mine.

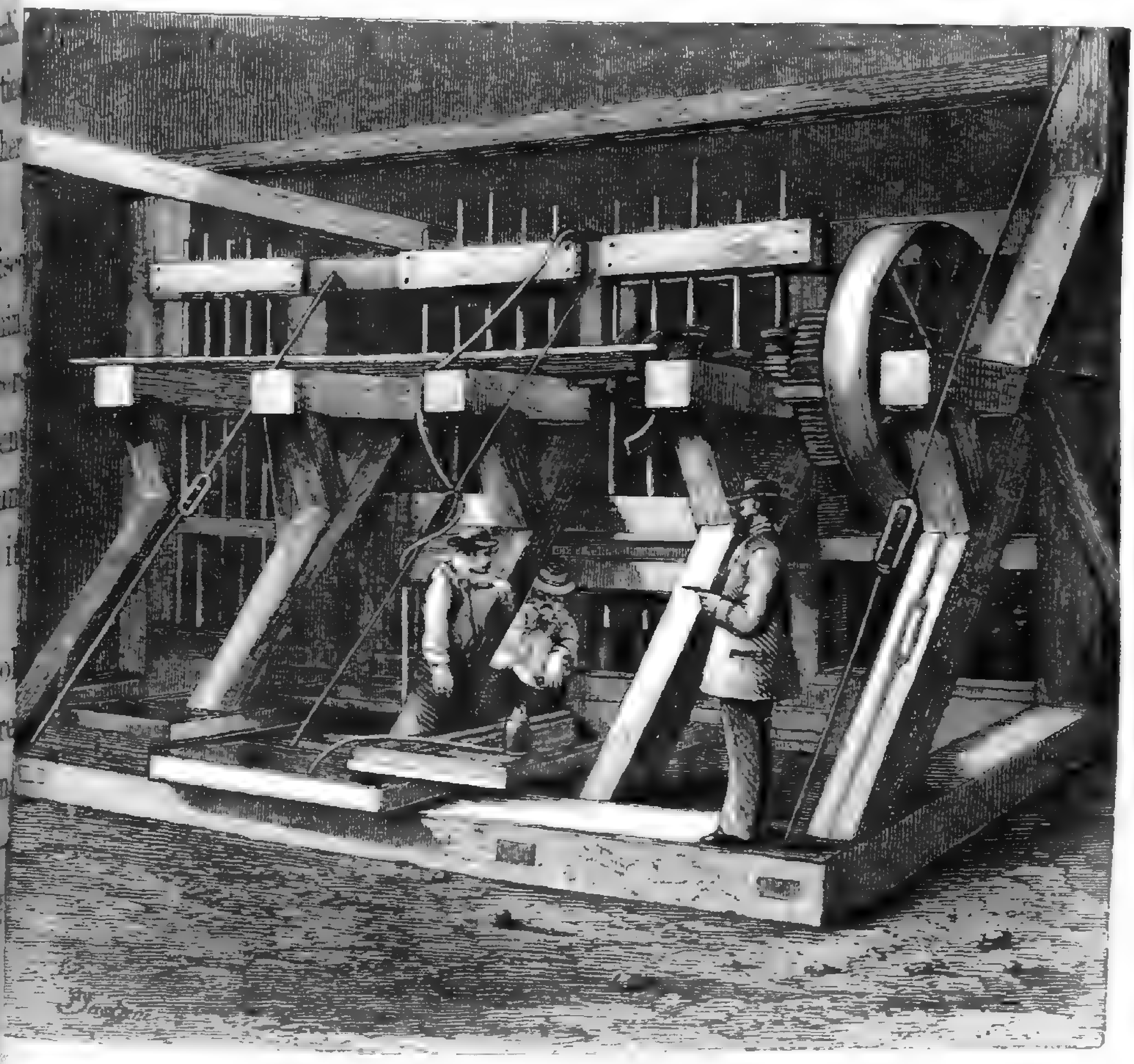
Then we inspected the placer diggings, whence the istrict takes its name. Here acres upon acres of earth ave been turned over and washed in the rough Mexican ashion. We were told that in most places, where there had een a land slide, an ordinary Mexican miner could even now pan out” from two to five dollars a day. Yet nowhere, xcept at the Americans' mines, did there appear to be the lightest activity. We expected to find a bustling throng of xcited miners, but there was not a sound to raise the echoes f the mountains. Where the signs of former industry lay hick around, all was solitude. In the village lay a large team-engine, and around it a dozen rude Mexican arastras, ut the stones were broken and the machinery was crumbling nto rust. When we asked why, we were told, first, that he Mexicans had no ambition to better themselves, and referred idleness to wealth; and secondly, that as yet either capital nor energy had entered the country, for the ttention of the public had not yet been directed to it. There is, however, undoubtedly one great drawback—carcity of water. Where it is most wanted it is either ntirely absent, or the supply is very insufficient. There are, however, in many places some good perennial streams, which can be utilised whenever sufficient capital is brought to bear upon them. By judicious boring, also, a supply may some day be obtained sufficient for every necessity. But should the local supply not keep pace with the requirements of the miners, any quantity could be conveyed in pipes from the Pecos, just as it is in a hundred places along the base of the mountains in California.

Looking down from the sides of the San Lazaro Mountain, we saw before us an extensive pine wood, covering some 800 acres, in a valley at our feet. The timber was of remarkable size—unusually large for any country, but a most valuable rarity in such a district as this. The question of railway ties, for many a long mile, both east and west of us, was here answered at a glance.

Bidding adieu to our friends at the Real de San Francisco, we passed on to see the works of the New Mexican Mining Company, seven miles distant, in the centre of the Old Placers. Here we were welcomed by Dr. Steck, the superintendent, who took us over his stamp-mill, which we saw at work, and explained to us the process of gold extraction through all its stages.

The engraving is taken from a photograph which I took of this mill, and shows the different parts clearly. The ore, after being broken into small pieces, is thrown into the long troughs into which the three sets of crushers—five to a set—descend. The crushers are given a rotatory motion as they fall, so that they grind and crush the ore at the same time. When the ore has been reduced to a muddy slime by mixture with water under the crushing process, it percolates through sieves into the shallow copper trays which are seen in front of the picture. These trays are coated with quicksilver, which sucks up the gold, swells to thrice its size, and forms an amalgam containing about two-thirds gold. This is scraped off, tied up in a piece of rag, and placed in a crucible for reduction. A dull red heat is necessary to drive off the quicksilver and leave the gold behind it in a state of purity. The men in the foreground are in the act of cleaning the copper trays with cyanide of potassium preparatory to recoating them with a thin film of quicksilver.

We next visited several of the mines, the chief of which were the Ramirez and the Ortez. From the latter a tunnel



A Gold Quartz Mill.

and tramway had just been completed, and the ore was being extracted in considerable quantities, and transported with rapidity and cheapness to the mill, a distance of two miles. The average yield, including all qualities of ore and quartz, just as it comes out of the shaft, exceeds 20 dollars a ton, and often rises as high as 27 dollars. For one quartz vein that is worked, there are dozens in these mountains as yet undeveloped, and probably hundreds still unknown; for everywhere, as we rode along, we noticed the quartz veins cropping out along the hill-sides. Nor are the gold and silver lodes the only minerals worthy of notice. In the New, as well as in the Old Placer districts, there are some magnificent veins of iron ore, upon one of which, 7 feet thick, we went through the process of "taking up claims" for about 1,000 feet. It was strongly magnetic, and specimens examined gave, on analysis, 65·27 per cent. of iron. Some pieces of carbonate from the Old Placers gave, on analysis, 36·49 per cent. of pure metal. There is plenty of lime hard by.

The copper ores, although abundant, have really been scarcely noticed by the miners, except in the instances where they contain gold to a very considerable amount. In like manner, the argentiferous galena, also very abundant, has only been examined for the sake of its silver, the lead having been ignored altogether as an article of commerce. Judging from the perseverance of the early Spaniards in working the silver mines in the Zandia Mountain, their profits must have been very great.

Lastly, on the New Mexican Mining Company's estate we visited a coal-bed of great interest.

The section of the exposure, as examined by our geologist, is the following:—

	Ft.	In.
Top of hill, grey porphyry, composed of orthoclase, with small crystals of black hornblende.		
Yellow sandstone	12	0
Shales, somewhat baked in places	10	6
Anthracite coal	1	6
Anthracite metamorphic slates	1	6
Anthracite coal	2	6
Shales	6	6

Then came another exposure of anthracite coal, 14 inches of which were alone visible. Shales, stones, and débris, covered the remainder.

Analysis of Placer Anthracite Coal.

Fixed carbon	88·91
Volatile materials	3·18
Water	2·9
Ash	52·1

proving it to be by far the best coal yet found west of the Mississippi. Since our visit, more anthracite coal veins have been discovered. The new superintendent (Mr. A. L. Anderson) writes that on November 30th he exposed 7 feet of a new vein, situated at a distance of three and a half miles from the mill; and discovered another narrower one, which he traced or one and a half miles along the Galisteo Creek.

Anthracite coal may be described as a natural coke. It is ormed, no doubt, from ordinary bituminous coal, or from ignite, by the action of heat, and is always found in close roximity to well-marked signs of volcanic disturbance. In his locality it has been altered by contact with a porphyretic yke, which has brought up to the surface the carboniferous imestone and superincumbent sandstone for miles along its rack, as well as the coal itself, which crops out in many places besides that visited by us. The coal has a beautiful ustre, fractures easily into blocks, does not blacken the ingers when touched, and gives no smoke. The advantage of anthracite over bituminous coal is well known to those who enjoy the clear air and exquisitely clean interior of the houses n Philadelphia, where anthracite alone is used. If the nthracite of the Placer Mountains shall be found, as is most probable, well-suited for smelting the iron ore which abounds n its immediate neighbourhood, its value will be great ndeed. It is, in fact, impossible to speculate upon the destinies of such a region as this, when it shall be tapped by a railway. At present it is completely land-locked.

The price of carriage for machinery, to say nothing of setting it up, is enormous. Labour must be dear, when all manufactured goods, as well as food, are at least twice the price they are at the farthest limits of the railways. Very few enterprises have a chance of succeeding under such disadvantages, but with the completion of the railway all will be changed; and I cannot help predicting that these mountains will at some time, not far distant, become a great centre for the manufacture of iron, from which rails will be supplied to railways ramifying through Texas to Memphis, to Vicksburg and to Galviston on the coast; down the Rio Grande to the city of Chihuahua, up that stream to Taos, and into the heart of Colorado; perhaps also along the 32nd parallel, and down to Guaymas, on the Gulf of California, if not still farther to Toquivampo or Mazatlan.

Saturday, Sept. 13.

After a ride of thirty miles over a most uninteresting plain, almost reduced to a desert from want of water, we came in sight of Santa Fé.

CHAPTER XIII.

SANTA FÉ.

he Town.—Spanish Nomenclature.—The Indian Paw-wow.—The Fonda.—Photographing the Fair Sex of New Mexico.—Arrival of Surveying Party from the Mountains of Colorado.—The *Baile*.—Election of Delegate to Congress.—Railway Meeting.—Santa Fé Traders.—General Palmer and his Visitors.—Rides amongst the Mountains.

HE fortnight spent at Santa Fé passed pleasantly and quickly away; and yet, although there was so much to see, to learn, nd to do, now that it is passed, there seems but very little to elate. The town itself could never agree with the preconceived deas of any one; for it disappoints you wofully on first ppearance, being neither romantically situated nor picturesquely built, having neither broad streets, fine churches, nor uaint old houses. All, or nearly all, the dwellings are of one tory; many of the largest cover several acres of ground, nd all have verandahs running round the greater part of their ircumference. They are all made of adobe, either whitewashed or bare; and very comfortable they are, with their olid walls, cleanly-swept floors, and fine large rooms. There are three Roman Catholic churches, all more or less dilapidated, but containing some fine French painted glass windows and a few good paintings; a nunnery, a bishop's palace, and a Protestant church, minus its roof. Although Protestant zeal once burned sufficiently bright to raise the walls and tower to their proper height, it never succeeded in giving the building a roof. The plaza is beautifully shaded with rows of cotton-wood trees, which surround a large grass plot, with a pagoda in the centre for the band. Around three sides of this square stand the principal shops and business houses; along the fourth stands the low pile of adobe buildings—200 years old—which is still called the Palace. Much of this old palace was being cleared away when we were there; and the workmen found, amongst other curious relics, a smelting furnace, which had been completely bricked up on all sides; and from the ashes pieces of coal were taken out, showing that, more than a century ago, the Spaniards had discovered that mineral, and used it for smelting.

How strange the Spanish nomenclature seems to us! These champions of the Cross have stamped the names of their saints and the technicalities of their faith on every mountain and valley, river and plain; and, not content with this, they have exhausted the long catalogue of their saints and holy epithets in lavishly naming their children.

There is scarcely a family without a *Jesus*, or a village without a fair sprinkling of fallen *Angelletas;* and yet it may be because we cannot realise without an effort the symbolic meaning of many of these terms, that they appear to us almost like wholesale blasphemy, disguised though they be in euphony—sugar-coated by what Byron would call "the soft bastard Latin that melts upon the tongue." Sante Fé, the "City of the Holy Faith" was, when christened, the only spot in the midst of a new realm of pagans upon which the Cross stood, and from which the light of Christianity shot its rays into the moral darkness around. Far up in the mountains, some Jesuit missionary, travel-worn and exhausted, encountered the farthest source of the Rio Grande; and after a refreshing draught of its cool, sparkling waters, he crossed himself, and called it, in thankfulness, "El Sangre de Cristo." A little lower down, two streams joined it; and here some

ious monk built his hut, recognised the symbol, and called
, from the meeting of the waters, "Trinidad"—the Trinity.
nother reared a cross in a beautiful valley, and called it
Santa Cruz;" while some early settlers almost thought they
ere ensuring a blessing for their posterity when they chris-
ned their poor shanties Santa Domingo, Jesus Maria, Spirito
ancto, and the like. Apart from Scripture names, many
plied by the Spaniards are very happily chosen. There is
e Manzana Mountain, celebrated for its oak trees; the
andia, shaped exactly like a huge water-melon. There is
e "Jornada del Muerto," or journey of death; and there is
e little village at the point where this arid trail reaches the
o Grande, aptly named Socorro.

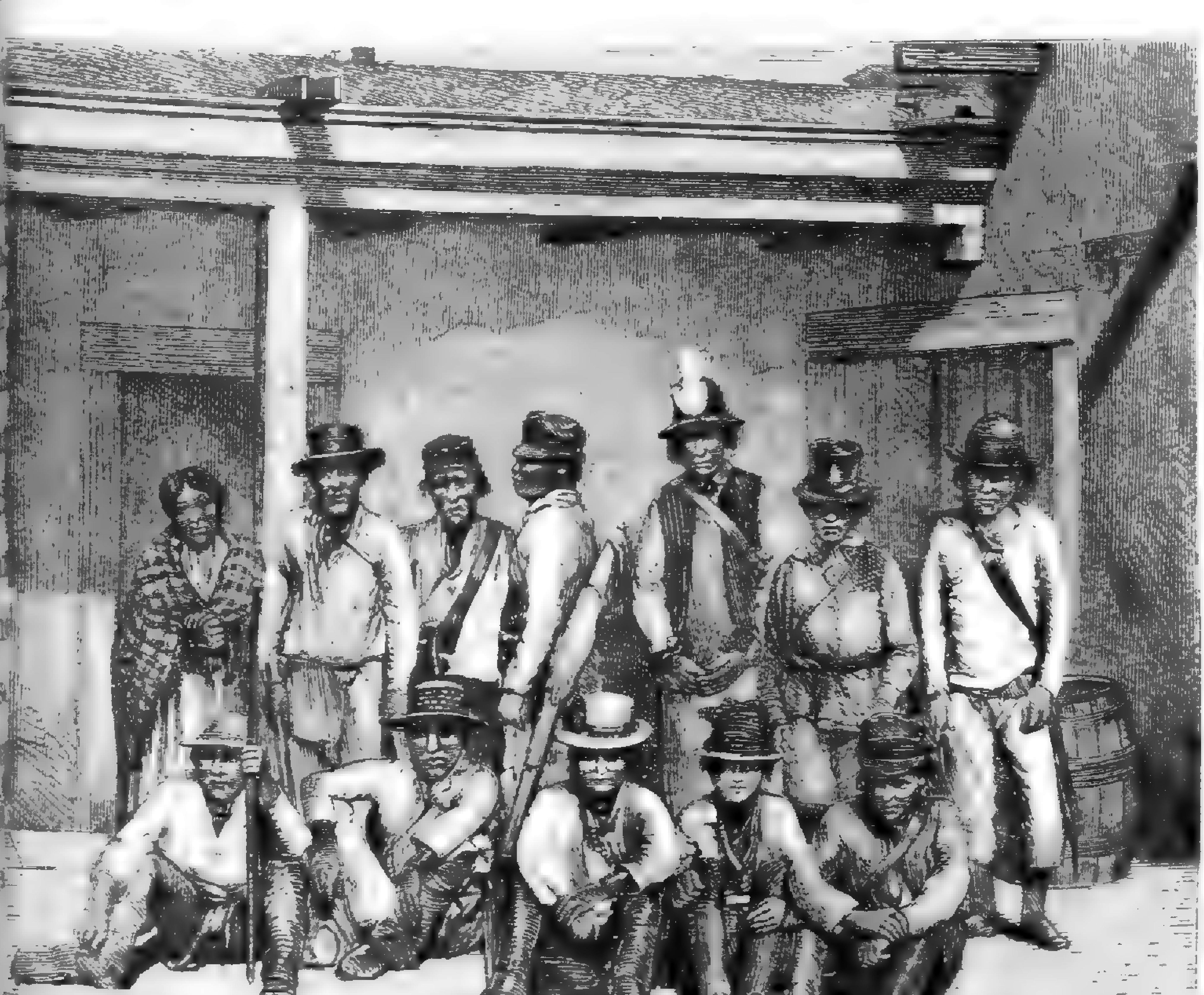
Compare these with the names we find all over Colorado—
Tarryall Ranche," "Cash Creek," "Gulcher Diggings,"
Buckskin Joe," "Fair-play," "Strip-and-at-him Mine,"
Hooked Man's Prairie," and the like—and we have about
great a contrast as exists in reality between the rough,
anly Saxon pioneer and the indolent, superstitious Mexican.

The first excitement on our arrival was an Indian "paw-
ow," which happened most opportunely. During the
orning, a party of Navajo warriors, headed by the chief,
n-hor-cita, came into town to arrange some matters relating
their brethren; and, not long afterwards, one of the most
terprising of the Comanche chiefs came with his wife—a
exican by birth—to trade with some of the merchants. It
ppened that of late the Comanches, who are a very warlike
ce, had been harassing the unfortunate Navajos at the
osque reservation on the Rio Pecos, where they are kept
the Government, and causing thereby a great deal of
ffering and ill-feeling; for the Navajos, having been at last
bdued by the military, were now in so deplorable a condi-

tion that they could no longer protect themselves against the neighbouring savage tribes. So the paw-wow was got up to try to induce this Comanche chief to return to his people, and persuade them to keep the peace with the Navajos.

All the warriors were brightly painted and fantastically dressed; they sat around the room, and after much talking—at which the Mexican wife, being general interpreter, was spokesman on both sides, and seemed to arrange everything completely to her own satisfaction—a lasting peace was agreed upon, and each party pledged themselves to return to their own people and try to obtain a ratification of the compact. Then followed much embracing and the presentation of gifts, which consisted in the exchange of hats, skins, pistols, tomahawks, quivers, and all sorts of unmentionable garments, between the old chief and his wife on one side, and the Navajos on the other, so that the former became attired and armed with the clothes and weapons contributed by their different friends; while their own clothes, regardless of sex, were dispersed amongst half-a-dozen or more of the Navajo braves. This scene ended, all squatted down upon the floor, and the pipe of peace was lighted and handed round for each to take a whiff.

But the Comanche chief was glum and thoughtful, and deep forebodings weighed heavily upon his countenance. At last he rose up, and through his wife made, no doubt, a most touching and eloquent harangue, the purport of which was that, being in the minority, he much feared he could never reach home to conciliate his people; for the others would overtake him on the way and kill him, as his great age and failing strength would not allow him to escape out of their hands. Then the Navajo chief rose with much dignity to reply, and, placing his hand on his heart, said that he mourned his dear brother should think so meanly of him. Then pointing to the sun, he said that he hoped the good Spirit now looking at him would take his life and that of his whole family if he did not keep good faith with his dear brother. At this Ben-hor-cita, trembling with emotion, threw imself, weeping, into the embrace of the Navajo chieftain; hen, taking off a magnificent cocked hat, adorned with a rge shiny piece of tin in front, he placed it on his head, nd this brought the paw-wow to a most successful climax.


Navajo Braves.

Notwithstanding the protestations of friendship, old Ben-or-cita thought it prudent to steal away during the night; nd although I watched him closely, in order that I might ecure his photograph before his departure, he escaped me.

I found the *fonda*, or hotel, very comfortable: the bedrooms were large, usually containing each three beds. Mine opened upon the court-yard, and as light was admitted by a trap-door at the top, which also acted as a ventilator and could be put up or down at pleasure, I converted my chamber with ease into a dark room, and used the court-yard as my photographic studio. Thither, in the morning, I brought the Navajos, and with a good deal of difficulty and persuasion obtained a capital group, the most conspicuous object in it being the admiral's cocked hat and tin ornament worn by the chief. I then let them mount their horses, and took another view of them in travelling rig.

The photographic studio was kept going all the time, and whenever I could decoy a Pueblo Indian wandering about the street, or a picturesque little black-eyed señoritta, or any other study into my net, they did not escape without leaving an impression behind them. The fair sex were rather hard to manage, as they had an idea that they were turned upside down in the camera, and strongly objected to such a liberty being taken with them. Often, after spending much time and trouble in collecting and forming a group, some knowing one would start this idea, and all would run for their lives, and hide.

Early on the morning of the third day after our arrival at Santa Fé, two of our friends came into the fonda—Calhoun and Imbrey Millar—whom we parted with at Fort Lyon; and before evening all Millar's party arrived safe and sound, but much travel-stained and almost shoeless, from their mountain explorations. After leaving us at Fort Lyon, they had followed up the Arkansas and its tributary, the Huerfano, through the Sangre de Cristo Pass to Fort Garland, a military post in the centre of the Rocky Mountains of Colorado; and er examining some of the most favourable passes which ad from the heads of the Huerfano to the sources of the o Grande, they followed the latter stream for 200 miles wn to Santa Fé. Next day they started for Fort Craig, nost the same distance farther south; so they had little ne to enjoy Santa Fé. Calhoun, however, remained with . He was the most dilapidated fellow I ever met; for, ring a six weeks' tour far away to the north of Garland, had carried nothing but his saddle-bags, had left his horse the safe keeping of his friends, the Ute Indians, and had ffered many privations and hardships. We were very glad meet again, and, by way of seeing a little of Mexican life, ent to the *baile* in the evening.

This was a strange sight. In a room about sixty feet long twenty wide, was collected at about nine o'clock a very nsiderable proportion of the youth and beauty of the town, hich, however, is not paying the fair sex present any par-ular compliment. They wore roboses, often gracefully rown over their heads, gay coloured dresses, big brooches d pendant earrings, smoked sigarettas incessantly, and sat ietly on forms placed around the room, waiting for any one ho should choose to ask them to dance. The band occupied platform at one end of the room, and consisted of a clarionet, French horn, and three large brass instruments which groaned at the bass. At the other end of the room, slightly parti-oned off, stood the bar, and it was customary at the conclu-on of every dance to take your fair charmer to the counter d pay an exorbitant sum for sweetmeats, fruit, wine, or ocktails, as the case might be. In fact the luxury of each ance represented half a dollar, which, being interpreted, eans "one-and-six;" thus, although no admittance is paid the door, a reckless votary to the giddy dance would find his evening's amusement rather expensive. The dancing, however, was well worth watching; for those sun-burnt brunettes glide most gracefully through the languid and suggestive movements of their Spanish dances. An occasional quadrille was formed in honour of the Americans present; and thus the evening passed away with—quadrille, drinks—slow waltz, drinks—Spanish reel, drinks—mazurka, drinks—and so on, with sigarettas *ad libitum.*

The Delegate to Congress for New Mexico was elected during our visit, and caused for the time a great deal of excitement. The inhabitants here know or care very little either about the squabbles between North and South, the nigger question, or the fundamental difference between a Copper-head and a War-Democrat. Mr. Clever represented the American party, whose motto was of course "Progress." Mr. Chavez, his rival, was a Mexican, and advocated the individual interests of the large landowners, who felt the raid against peonage, and the increased price of labour caused by the developing influence of the new-comers to be greatly prejudicial to their interests. The American party for the first time carried the day, and their victory was commemorated by a ball to Clever and Progress, and other appropriate rejoicings. Some of the young ladies who were present we had met before at Fort Union; they did not consider a hundred-mile drive at all too long for so great an occasion as the Santa Fé ball. In this I quite agreed with them.

Then we had of course a railway meeting, at which everything was said that could be said to enlighten the populace, and to explain to them the wonderful results to be expected when "El cameno de fiero caril" should traverse the territory. The speeches had all to be re-delivered in Spanish by an interpreter, and so impressively was the subject put that one could help seeing that their fortune was only a matter time provided the railway passed near enough to their roperties. This difficulty was easily overcome by promising y number of branch lines, and thus the meeting ended ost auspiciously, and all the resolutions were in due form arried unanimously.

A large proportion of the traders are of German-Jewish xtraction, and, taking them all in all, they are by no means bad set of fellows, and are well suited to the position they ccupy at the farthest outskirts of the commercial world. Their tores are well filled with everything required by the emigrant, nd a good deal of rubbish to meet the demands of the Indian opulation. A large trade is done in paint and brass jewelery, and a still larger one was formerly done in fire-arms, ome specimens of which I examined with great curiosity. he wholesale price of the single-barreled guns was two and half dollars each, and they could not possibly go off without ursting. However, since the Navajos have been "improved" ff their country, the market for this kind of goods has ceased, nd as Northern Mexico no longer produces the vast hoards f precious metals which formerly enriched its inhabitants, he Santa Fé trade has degenerated to local insignificance, nd the great Santa Fé trader has now joined the other omantic characters of by-gone days. No doubt he will gain reappear on the scenes, but so changed that we shall carcely recognise him; he will wear a frock coat and a linen hirt; his goods will come by steam; and his stories will elate, not to Indian fights, but to railway accidents.

It is needless here to mention the hospitality shown us by the military, the bar, and the traders; suffice it to say we did not leave without many regrets, knowing that there was but ittle chance of our ever meeting those hearty Western friends again. Poor Judge Slough, the chief justice of the territory, who was amongst the kindest of our hosts, was shot in a duel at the fonda before we had reached San Francisco. The quarrel originated out of some political dispute at the election of delegate. Not long since, an indefatigable traveller came back from his explorations about the 35th parallel; he also stopped at the fonda, and while collecting additional information at Santa Fé, was stabbed in the gambling room of the hotel, and all his papers perished with him.

General Palmer held quite a levée here. His rooms were always crowded with men either interested in the railway or well acquainted with some portion of the country to the westward. Here all possible information was obtained both about the 32nd and 35th parallel routes, and the relative advantages seemed from the reports to be so evenly balanced, that the General decided finally that both routes must be separately examined, and that some of the surveyors must retrace their steps from Fort Craig, while others were immediately sent for from the States.

When tired of work, Palmer, Colton, and myself would saddle our horses and ride up the mountains, amongst the silver spruce and pine forests, and enjoy to the utmost the enchanting climate. Santa Fé stands at an elevation of about 7,000 feet above the sea, and the great eastern main chain of the Rocky Mountains ends in some fine bold spurs a little to the north of the town. Every day was cool, calm, and cloudless, the atmosphere was so clear and sparkling that it was a perfect luxury to allow the eye to wander far away over the vast tracts of country which lay at our feet as we climbed up the mountains; and to contrast the undulating plain on one side, the broken rugged country on the other, and the granite peaks, which rose abruptly into the blue sky, at our back.

Photography and railway business occupied most of my time at Santa Fé, but I became very much interested in the Indian question, and there collected the greater part of the material from which the following account of the native races has been compiled. The five next chapters also embody the result of my subsequent travels amongst different tribes, and I think the advantage of representing the subject as a whole, greatly overbalances the slight inconvenience of being obliged to anticipate a few of the incidents which occurred later on in the narrative.

PART II.

THE NATIVE RACES OF NEW MEXICO.

THE

NATIVE RACES OF NEW MEXICO.

CHAPTER I.

THE SEMI-CIVILISED TRIBES.

Four distinct races are encountered in New Mexico:—*The Pueblo* (or *town*) *Indians* are the most remarkable.—Our first introduction to them.—The Pueblos of the Rio Grande Valley; Dress, Government, Religion, Traditions, &c.—Indian Towns composed of Houses having but one story.—Fortified Towns: Laguna (two stories), Acoma (three stories), Pueblo of Toas (seven stories), Zuñi (six stories).—The Inhabitants of Zuñi; Manners, Customs, Arts, Agriculture, &c.—The seven Moqui Pueblos (all fortified towns of three stories).—Elaborate system of Irrigation adopted by the Moqui Indians.—The Pimas of the Rio Gila, their Dwellings, Productions, Manufactures, Wealth, Manners, past and present Condition.—The Papagos, great Traders, Conversion to Christianity.

ARIZONA was separated from New Mexico in 1863; it is desirable, however, for the present purpose, to consider both Territories as a whole.

Four distinct races are now encountered by the traveller in New Mexico. These are:—

	Population.
1. The Americans	about 13,000
2. The Mexicans	„ 75,000
3. The Pueblo Indians	„ 16,000
4. The Wild Indians	„ 23,000
	127,000

The semi-civilised native races and their natural enemies require to be described separately. The Pueblo, or town Indians, are the most remarkable and important tribe to be found in any part of the United States or Canada; they are, in fact, the only native race whose presence on the soil is not a curse to the country.

Whilst on the plains, whatever belief we had in the nobility of the red-skin, or the cruelty of the frontier man, quickly vanished, and we learnt to regard the Indian of the plain as the embodiment of all that was cruel, dastardly, and degrading. We were not long, however, in the Rio Grande valley before we encountered a new race, as different from our old enemies as light from darkness.

I first met a small party of these people on the plain a few miles west of the Pecos; they were neatly dressed in buckskin shirt and breeches, which latter fitted tightly to their legs; they wore moccasins on their feet and a girdle around their waist. Their heads were bare, their black hair was cut square in front almost to the eyebrows, and gathered up behind into a queue bound round with red cord; a narrow band also passed over the hair in front and was fastened underneath. They were short in stature, thickly built, with quiet, intelligent faces and large sorrowful eyes. I never, during my residence in their valley, saw a Pueblo Indian laugh; I do not remember even a smile. They carried no arms that we could discover, but each pushed before him a little hand-cart composed of a body of wicker-work on wooden wheels, filled with grapes, the produce of their vineyards. They were on their way to Los Vegas, and seemed so sure of a good market, that we had to pay ten dollars for a large basket of grapes weighing from fifty to eighty pounds.

At Santa Fé I watched these people coming and going, bringing their produce in the morning—peaches, grapes, onions, beans, melons, and hay—for sale, then buying what necessaries they wanted, and trudging off in the afternoon quietly and modestly to their country villages. I looked on them with pity, and wondered what they thought of this new state of things, and how they liked the intruders whose presence they bore so meekly. I met Mr. Ward, their agent, who treats them as the kindest father would his children; and often went to his house, where Indian parties from a distance were sure to resort for information and advice. When I left Santa Fé I passed through many of their villages, saw them in their houses, visited their fields and vineyards, and watched them as they assembled on their housetops at sunrise to look for the coming of Montezuma from the east.

The semi-civilised Indian of the United States is only to be found in New Mexico and Arizona, south of the 36th parallel of latitude, nor is there any proof whatever, but merely some vague traditions, to show that he ever came from the north, or spread farther northward than the Rio Grande valley and the accessible branches of the San Juan River. In these two territories—together, equal in size to France—only five small remnants of this once powerful nation remain at the present time. These are:—

1. The Pueblo Indians of the Rio Grande valley; population, 5,866.

2. The Indians of Zuñi, situated about latitude 35°, longitude 108° 50′, with a population at present of 1,200 souls.

3. The Indians of the seven Moqui pueblos, situated about 150 miles north-west of Zuñi; population 2,500.

4. The Pimas of the Gila valley, occupying eight villages; population, 3,500.

5. The Papago Indians of the regions south of it, occupying about nineteen villages, and numbering not less than 4,000 in all.

The Pueblo Indians of the Rio Grande valley were early converted to Christianity by the Spanish missionaries. Each pueblo has its church, built of adobe, and dedicated to its patron saint. An exact copy of one of their churches is given in the engraving.

The following table was kindly furnished me by Mr. Ward; it clearly shows the state of the population during three quarters of a century:—

TABULAR STATEMENT OF INDIAN PUEBLOS (VILLAGES) WITHIN THE TERRITORY OF NEW MEXICO.

No. of pueblos.	Names of pueblos, with the names of their respective patron saints.	Census.					Spanish grants in acres.	Date of grants.
		1790.	1809.	1850.	1860.	1864.		
1	Taos, San Geronimo de	518	527	361	363	361	17,560	1689
2	Pecuries, San Lorenzo de	254	313	222	143	122	17,460	"
3	Abiquiu, San Tomas de	216	126	...	...	..	...	
4	San Juan de los Caballeros	260	208	568	341	385	17,544	"
5	Santa Clara	134	220	279	179	144	17,368	"
6	San Ildefonso	240	283	139	154	161	17,292	"
7	Pojuaque, Nuestra Señora de Guadalupe de	53	000	48	37	29	13,520	"
8	Nambé, San Francisco de	155	133	111	103	94	13,586	"
9	Tesuque, San Diego de	138	160	119	97	101	17,471	"
10	Pecos, Nuestra Señora de los Angeas de	152	000	...	...	...	...	
11	Cochiti, San Buenaventura de	720	697	254	172	229	24,256	"
12	Santa Domingo	650	720	666	261	604	74,743	"
13	San Felipe	532	405	411	360	427	34,766	"
14	Sandia, Nuestra Señora de los Dolores de	304	364	241	217	197	24,187	1748
15	Isleta, San Agustin de la	410	487	751	440	786	110,080	"
16	Belen, Nuestra Señora de la	000	133	...	...	...	...	
17	Santa Ana	356	550	399	316	298	...	
18	Zia, Nuestra Señora de la Assumpsion de	275	286	124	117	103	17.514	1689
19	Jemes, San Diego de	485	297	365	650	346	17,510	"
20	Laguna, San José de la	668	1,022	749	927	988	...	...
21	Acoma, San Estevan de	820	816	350	523	491	...	...
22	Zuñi, Nuestra Señora Guadalupe de	1,935	1,598	1,500	1,300	1,200	...	...
		9,275						
	Within the jurisdiction of El Paso.							
1	Seneca, San Antonio	410	...	...	...	...	...	
2	Isleta, San Antonio de la	430	...	...	...	...	...	
3	Socorro, Nuestra Señora del	620	...	...	...	...	...	
4	San Lorenzo del Real	440	...	...	...	...	...	
26	Total	11,175	9,345	7,657	6,700	7,066		

NOTES.—The censuses of 1790 and 1809, were taken by order of the Spanish authorities. This duty was usually performed by the missionaries, or parish priests, residing among the Indians; hence, there is every reason to believe that they were accurately taken.

The censuses of 1850 and 1860 were taken by the deputy marshals, appointed for the purpose by the United States; and those of 1864 were taken by me, at which time I visited all the pueblos, Zuñi excepted; but my previous visits to, and knowledge of, this pueblo, warrant me in placing the number of its inhabitants at the figures inserted in this return.

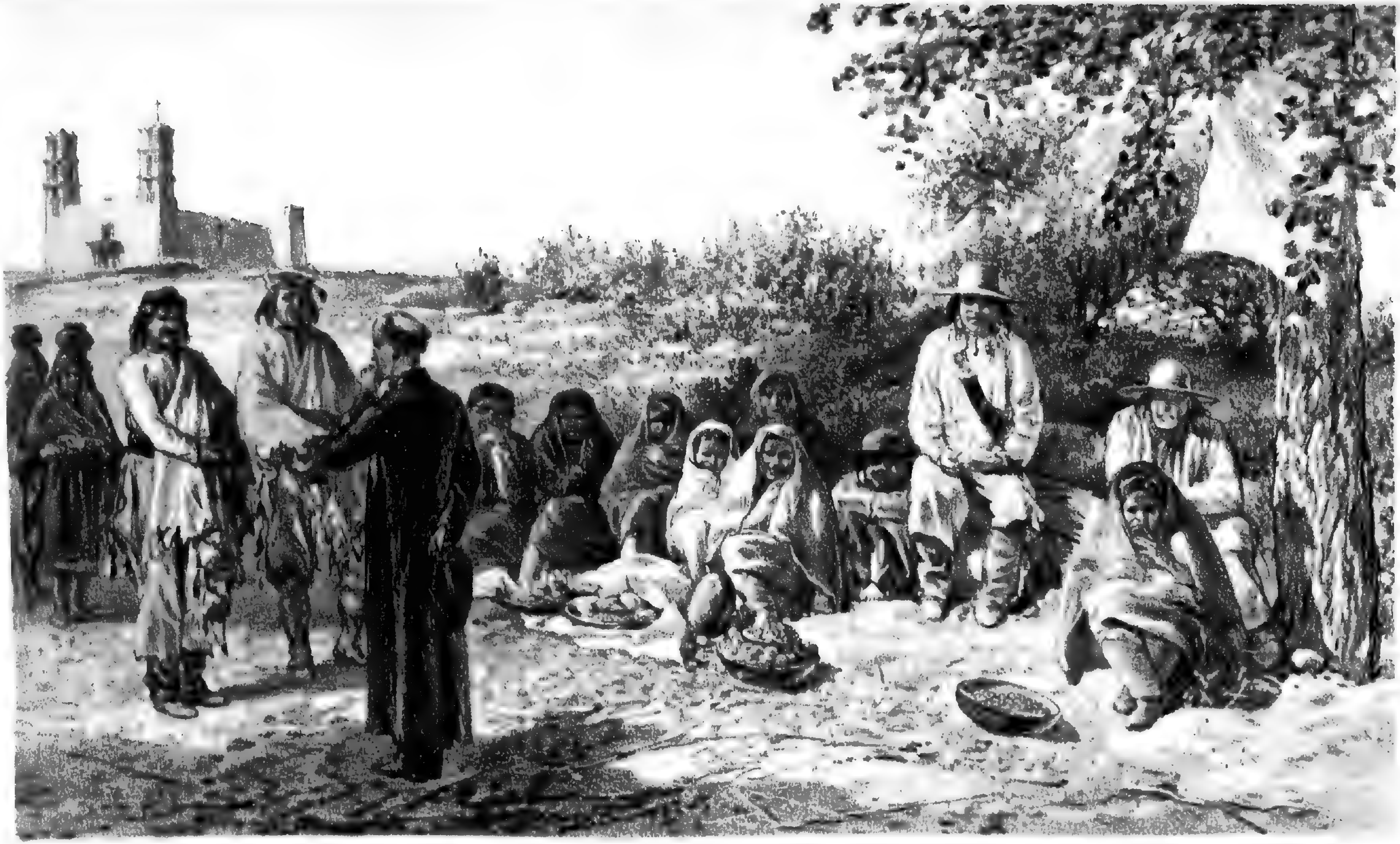
To read the names of the pueblos properly, they must be read thus: San Geronimo de Taos, San Lorenzo de Pecuries, and so on, except Nos. 4, 5, 6, 12, 13, and 17, which must be read as they are inserted, and also San Lorenzo del Real.

Ciphers indicate no census given during the date under which they are inserted.

The dots opposite to the names of the three respective pueblos are simply intended to fill space, those pueblos having been out of existence for many years.

SANTA FÉ, NEW MEXICO, *July* 10, 1867.

JOHN WARD, *Special Agent for Pueblos.*



PUEBLO INDIANS OF THE RIO GRANDE VALLEY

Most of the above villages are in the main valley. Others, such as the Pueblos de Toas, Laguna, Acoma, San Domingo, and others, occupy isolated positions on some of the tributary streams. The villages in the Rio Grande valley differ but little from those of the Mexicans, except that the houses are larger and loftier. They are usually of only one story, but each house is capable of containing several families; the roofs are flat, and at different corners of the village watch-towers rise above the roofs. In the centre of the chief house in the village, a good-sized room, partly formed by excavation into the earth, is usually to be found. This is the *estufa*, or place of worship, where the sacred fire was formerly kept burning, and where all religious services used to be held before the Indians became Christians. Now it is used in most villages only as a council chamber; but Colonel M'Leod, of Santa Fé, assures me that in some places the sacred fire is still kept burning, and that on one occasion he was permitted to visit an estufa where it continues to exist.

Each pueblo has a separate government of its own, consisting, first, of a *cacique*, or governor, chosen from amongst the men advanced in years—the sages, in fact. The cacique holds office for life, he presides over the council, and is chosen for his wisdom. His decisions are usually adopted. Secondly, a war captain is selected from amongst the braves, who arranges all campaigns made against an enemy, and through his lieutenant—or master of the horse, as we should call him—has the management of the *nahallada*, or horse-herd. Third, the fiscal-major and his assistants regulate church matters, repair the churches, &c. The old and experienced men collectively are the law-makers, and elect all officers except the cacique, who is chosen by universal suffrage. The people of the villages do not all speak the same tongue, and they resort to the Spanish language, which they acquire with tolerable facility, as a common medium of communication. The Pueblos form five groups, if classed according to dialects.

1. Pueblo de Toas, de Pecuries, Sandia, and Isleta.

2. San Juan, Santa Clara, San Ildefonso, Nambé, Pojuaque, and Tesuque.

3. Cochiti, San Domingo, San Felipe, Santa Ana, Silla (Zia), Laguna, and Acoma.

4. Jemes.

5. The pueblo of Zuñi. Those of the Moqui pueblos speak the same dialect as that of Jemes. The Spanish missionaries found little difficulty in teaching these natives to read and write, but since the decay of religious establishments throughout Northern Mexico education has been arrested, and now not a single school exists in any of the pueblos.

In religion they are, to outward appearance, devoted Roman Catholics; the few priests who still work amongst them are Frenchmen, and are much respected and beloved. The rites of baptism, marriage, and burial take place in the village church, and they keep the feast-day of their patron saint with great festivities.

The isolated pueblos, which lie at considerable distances from the main valley, are very different in appearance from those simpler one-storied villages which once dotted the banks of the Rio Grande del Norte in very considerable numbers. In these, the distinctive peculiarities of the native fortifications are very striking. Laguna, on the Rio de San José, is built on the summit of a limestone cliff, some forty feet high, possessing considerable natural advantages for defence. The houses are mostly of stone plastered over with mud, and two stories high. Neither windows nor doors are to be found on the outer wall of the first story; the second rises a little back from the roof of the first, leaving a ledge in front of it. Ladders are used to mount to this ledge; they are then drawn up, and the rooms are entered either by openings in the roof leading to the ground-floor, or by doors giving entrance from the ledge to the second suite of rooms; the latter alone are used for sleeping. Store-rooms occupy the ground-floor.

In 1858 there was a Baptist minister at Laguna; and in one of his reports to the Indian department of the Secretary of the Interior he stated that the amount of real Christianity amongst the Indians is very small; they cling to the religion of their forefathers, and can only be induced to attend the service of the Roman Catholic Church by threats, promises, and even blows, whereas they perform their own religious duties with the utmost regularity. He also joined in the universal eulogium on the honesty and sobriety of the men, and the virtue of the women.

Acoma, some twenty miles west of Laguna, is a large and very interesting pueblo. It rests on the summit of a flat mesa, whose perpendicular cliffs rise to a height of from 300 to 400 feet above the valley. The houses here are three stories high, built on the usual principle, each successive story being smaller than that on which it rests. Ladders are also used to reach the ledges. The flat top of the mesa includes about fifty acres of land; it is reached by a steep winding path cut in the rock, and so placed as to be easily defended. It is a very wealthy pueblo; the Indians own abundance of cattle, and grow large quantities of corn, peaches, pumpkins, and other produce.

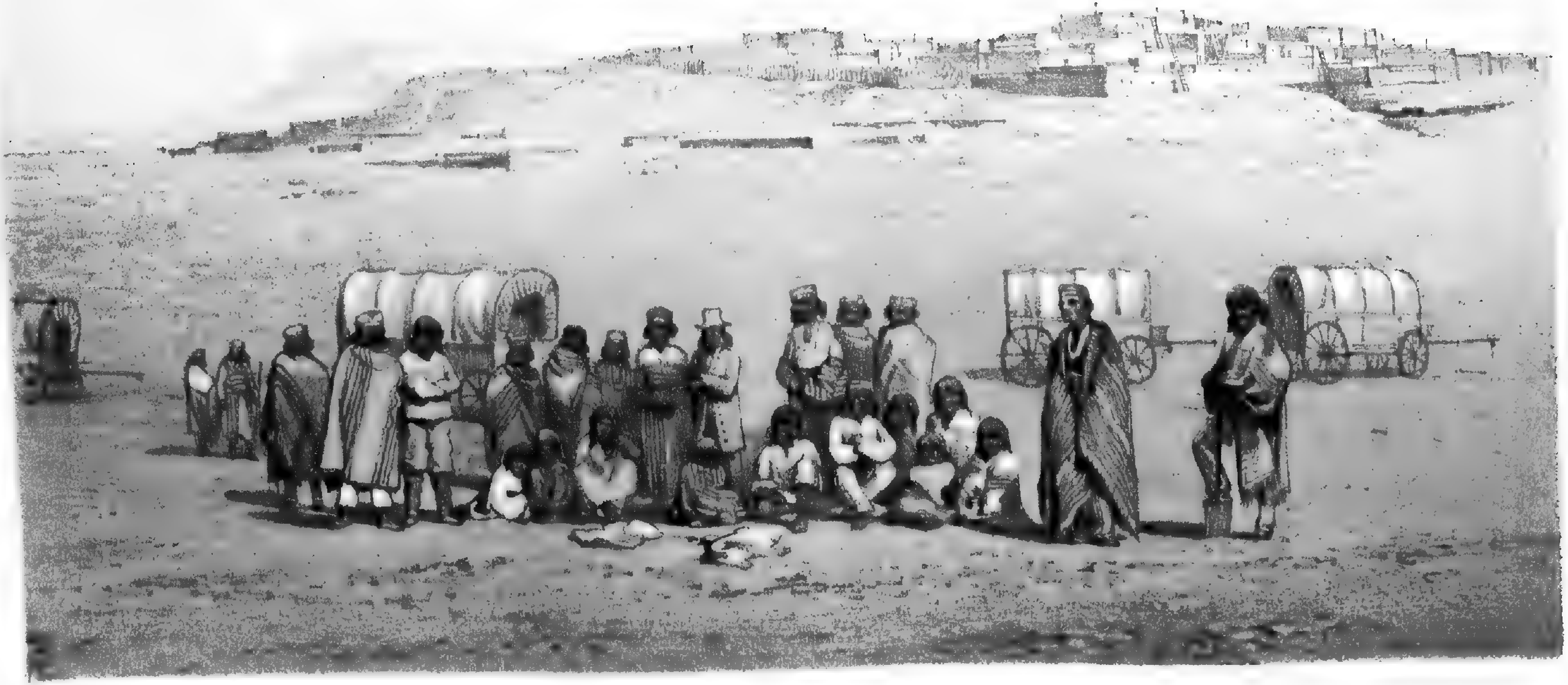
The houses of San Domingo, Sandia, and others, although only built of one story, have no doors or windows on the outside, but are entered by ladders from the roof.

The ancient pueblo of Toas consists of one compact fortress, formed of terraces seven stories high, and built on a rock overlooking the stream. So strong was it as a place of defence, that, in 1847, when the Mexicans of the village of Toas could no longer defend themselves against the Americans, they betook themselves to the Indian pueblo a few miles distant, and there sustained a protracted siege, yielding at last only when provisions had utterly failed. This pueblo, moreover, was never taken by the Spaniards, although it was many times attacked.

Venegas, Coronado, and, in fact, all the early Spanish explorers and writers upon New Mexico, describe numerous seven-storied fortresses now no more, and give many instances of the great bravery shown by the Indians in their defence. Those I have mentioned, however, with the exception of Zuñi and the seven Moqui pueblos, are the only native fortresses which now remain inhabited.

The most interesting of all the pueblos is undoubtedly Zuñi. The engraving, which is copied from a photograph, gives a good idea of its general appearance. It is built on a rising ground, affording an extensive view of the surrounding country, and six terraces at least can be counted one above the other. Ladders planted against the wall give access to the different terraces upon which the doors of the apartments open.

In the valley through which the Zuñi River (a tributary of the Colorado Chiquito) flows, are to be seen orchards—chiefly of peach trees—vineyards, fine corn plots, and vegetable gardens, producing onions, beans, melons, chili colorado (red pepper), pumpkins, &c. Formerly cotton was cultivated,



probably by Indians farther south; but now they obtain what stuffs they require from the Mexicans in exchange for farm produce. They do not raise their crops by irrigation, but depend entirely upon the rain-fall; hence all their traditions relate more or less to the production of water.

Not far from the town is a sacred spring, about eight feet in diameter, walled round with stones, of which neither cattle nor man may drink. The animals sacred to water—frogs, tortoises, and snakes—alone must enter the pool. Once a year the cacique and his attendants perform certain religious rites at the spring; it is thoroughly cleared out; water-pots are brought as an offering to the Spirit of Montezuma, and are placed bottom upwards on the top of the wall of stones. Many of these have been removed, but some still remain, while the ground around is strewn with fragments of vases which have crumbled into decay from age.

Not far from the present pueblo is a lofty mesa, which rises about 1,000 feet perpendicularly from the plain; upon this are many ruins of houses and a sacred altar, constituting all that remains of old Zuñi.

The following tradition is related about this place:—Long before the first appearance of the white man, a dreadful flood visited the land. Waters gushed forth from the earth, and huge waves rolled in from the west, drowning man and beast; even the wild Apaches and Coyotes did not escape. Then many of the people of Zuñi rushed to the lofty mesa, but many more perished in the waters. Night came, and yet the waters rose higher and higher, until they reached the water-mark still distinctly visible high up on the cliff wall. The great Spirit was very wroth with his people, and must be appeased by a fitting sacrifice. So the son of the cacique and the most beautiful maiden in the tribe were bound and lowered down into the seething flood; then the waves abated, and the remnant of the people were saved. The young man and the maiden were transformed into two lofty pillars of stone, which rise from a natural battlement on one part of the summit. Time has worn these two pillars into four. They are still greatly venerated by the people of Zuñi.

After building a town on the lofty mesa, they lived there for many years; but as it was far removed from their fertile bottom-lands, and as no second flood visited their country, they returned to their present abode. When the Spaniards, however, made war against them, they fled for a second time to their ancient stronghold, and, according to their own account, made a fierce resistance, by fortifying the only two approaches by which the summit could be gained, and by hurling huge stones upon their assailants; the enemy, however, was victorious.

Spanish influence was never strong enough at Zuñi to convert the natives to Christianity; they tolerated the presence of a church outside the walls of the pueblo (now a ruin), but they still cling devotedly to their old traditions, and attribute their temporal prosperity, and the comparative immunity of their country from drought, to the steadfast observance of their ancient ceremonies. They believe in the one great Spirit, and in Montezuma his son, who will some day come again to them from the east, and unite all the nations once more under his banner.

Our party found the people of Zuñi to be very honest, but uncommonly sharp traders, so much so that they had the greatest difficulty in buying any sheep from them, although they had flocks in abundance; they parted with their maize and farm produce much more readily, but they understood the value of everything so thoroughly that they always insisted on receiving *quid pro quo.* They seemed to take great pleasure in keeping tame eagles and turkeys. Albinos are unusually common amongst them, whose complexions are as fair as those of Europeans. Like the other branches of the Pueblo Indians, the women of Zuñi are very chaste, and plurality of wives is not allowed.

Situated to the north-east of the San Francisco Peaks, about twenty miles from the Colorado Chiquito, on the opposite side to the mountains, are grouped, within a radius of ten miles, the seven villages of Moqui. The country is arid and uninviting, much broken, and partly formed of steep mesas, partly of volcanic peaks. Upon the very edge of some of these mesas the villages are planted. They are mostly of three stories, built in the form of a square, with a court, common to the whole community, forming the centre. The first story, or basement, consists of a stone wall 15 feet high, the top of which forms a landing extending round the whole. A flight of stone steps leads from the first to the second landing, and thence up to the roof. The doors open upon the landing. The houses are three rooms deep; the first being used for eating, cooking, &c.; the others as sleeping apartments. Great neatness is observable both in the household arrangements and personal habits of the people. They sit upon skins on the floor, clothe themselves with linen trousers, shirts, and a Navajo blanket thrown across their shoulders. Upon the walls hang bows, arrows, quivers, antlers, blankets, articles of clothing, &c.; vases, flat dishes, and gourds, filled with meal or water, stand usually along one side of the room. In complexion they are rather fair for Indians; although quiet in their manners they are very light-hearted; honesty, frankness, and hospitality are amongst their good qualities, but they want the manly bearing of the Zuñi Indians, and have, until lately, lived in great fear of their warlike neighbours, the Navajos.

The most interesting features about their villages are the reservoirs which they build to retain the rain-water. At the back of each building, upon the mesa itself, a good-sized reservoir, some five feet or upwards in depth and lined throughout with masonry, is usually to be found; a little lower down is a second one, with a pipe leading to it from the former. This lower reservoir is for the animals, the upper one for the people, and for household use. On each side of the tanks, the sloping sides of the mesa are formed into terraces neatly paved with masonry, and surrounded by a raised edge, so as to retain the water brought to them through pipes from the reservoirs. Peach trees grow upon the terraces, and most of their crops are raised in this way by carefully husbanding the rain-fall and using it for irrigation. Many flocks are owned by them, and most of the sheep are black.

Mr. Leroux, who was the first American to visit them (1850), estimated the united population of the seven villages at 6,700, the largest containing 2,400 inhabitants. Since then, however, small-pox has committed terrible ravages amongst them; and they have also suffered for several seasons from great deficiency of rain-fall; so much so that they have been strongly advised to migrate to some more hospitable region. Within the last six years, however, the rains have been more abundant, and by the latest reports from that out-of-the-way region, they seem to be in a very flourishing condition. Mr. Ward, however, after a careful inspection of the different communities, places the present population at only 2,500 souls.

The next group of semi-civilised Indians—the Pimas of the Rio Gila—differ from those I have already named, in that they inhabit huts instead of houses. In all other respects they are very similar.

After the Rio Gila has emerged from the succession of deep gorges through which it crosses the Pina-leño Cordilleras, it waters a rich and fertile valley forty or fifty miles long, between the mountains and the Gila desert. About twenty miles of this valley is occupied by these people. They devote themselves entirely to agriculture and to the arts of peace, but they are brave in war, and maintain a complete military organization for protection against the incursions of their wild neighbours, the Apaches. I have often heard it said by Western men, that there are only two spots in New Mexico and Arizona where you can be certain of absolute safety; the one is in the pueblo of Zuñi, the other amongst the Pimas on the Rio Gila. Both these peaceful tribes have been most useful allies of the United States troops in their expeditions against the Navajos and Apaches; it has, indeed, been only through the assistance of the Pima warriors that any success has ever been gained against the latter sons of plunder.

The valley varies in width from two to four miles, and grouped up and down the stream, usually on ground a little above the level of the low-lying bottom-lands, are seen the cone-shaped huts which compose the villages. The huts are easily built, as they only consist of a framework of willow poles stuck in the ground, and arched over to meet in the centre; these are interlaced with others at right angles, and then covered with wheat-straw, neatly pinned down all round the sides, which may or may not be daubed over with mud, and nicely thatched at the top.

Were we to judge only from their dwellings, we should place these people very low down in the list of Indian tribes; but when we examine the means which they adopt for raising their crops; when we see with what labour and skill they have divided off their lands into little patches of about 200 feet square, and have dug many miles of irrigating canals, each set radiating from the main artery, or "acequia madra," to supply every patch; then when we look at the pottery, the beautiful basket-work, the stores of farm-produce carefully packed away in well-made store-huts; when we see specimens of native weaving; and perhaps more than all, when we look at the soft intelligent faces of these Indians, we recognise directly the same people, to all intents and purposes, as we met in the Rio Grande valley.

The most complete list of the population I have been able to discover is that of Mr. G. Bailey, Indian agent for the Pimas and Maricopas, dated 1858. It is as follows:—

PIMAS.

Name of Village.	Warriors.	Women and Children.	Total.
Buen Llano	132	259	391
Ormejera, No. 1	140	503	643
,, No. 2	37	175	212
Casa Blanca	110	425	535
Chemisez	102	210	312
El Juez Farado	105	158	263
Arizo del Aqua	235	535	770
Aranca	291	700	991
	1,152	2,965	4,117

MARICOPAS.

Name of Village.	Warriors.	Women and Children.	Total.
El Juez Farado	116	198	314
Sacatost	76	128	204
	192	326	518

The productions are chiefly maize, wheat, beans, melons, pumpkins, onions, chili colorado (red pepper), &c.; they own a small quantity of stock, horned cattle, sheep, horses, pigs, mules, and poultry. They rely, however, for support mainly upon agricultural produce, milk, and eggs; and their production is so much in excess of their requirements, that they dispose annually of more than a million bushels of grain to the government agents, at from four to six cents a pound, which, in our money, is nearly twopence. They formerly cultivated cotton, but now they find it far easier to buy the few cloth goods they require than to weave them.

Major Emory, of the United States regular army, was, I believe, the first American to visit these people in 1846, when, as Lieutenant Emory, he took charge of a military reconnaissance from Fort Leavenworth (Kansas) to San Diego, on the Pacific. He thus describes the scene: "We had no sooner encamped, eight or nine miles from the Pima villages, than we met a Maricopa Indian looking for his cattle. The frank, confident manner in which he approached us, was a strange contrast to that of the suspicious Apaches. Some six or eight of the Pimas came up soon after at full speed, to ascertain who we were and what we wanted. They told us that the first trail we had seen along the river was that of their people, sent to watch the movements of their enemies, the Apaches. Their joy was unaffected at seeing that we were Americans, and not Apaches, and word to that effect was immediately sent back to the chief. Although the nearest villages were nine miles distant, our camp, in three hours, was filled with Pimas loaded with corn, beans, honey, and water-melons, so that a brisk trade was opened at once. Their mode of approach was perfectly frank and unsuspicious; many would leave their packs in our camp and be absent for hours, theft seeming to be unknown to them. On reaching the villages we were at once impressed with the beauty, order, and disposition of the arrangements for irrigating and draining the land. Maize, wheat, and cotton, are the crops raised by this peaceful and intelligent race of people; all had just been gathered in, and the stubbles showed that they had been luxurious. The cotton was picked and stacked for drying on the tops of the sheds. The fields are subdivided by ridges of earth into rectangles of about 200 by 100 feet, for the convenience of irrigating. The fences are of sticks, wattled with willow and mezquite, and, in this particular, are an example of economy in agriculture worthy to be followed by the Mexicans, who never use fences at all.

"In front of each dome-shaped hut is usually a large arbour, on the top of which is piled the cotton in the pod for drying. To us it was a rare sight to be thrown in the midst of a large tribe of what is termed wild Indians, surpassing many of the Christian nations in agriculture, little behind them in useful arts, and immeasurably before them in honesty and virtue. During the whole of yesterday our camp was full of men, women, and children, who sauntered amongst our packs unwatched, and not a single instance of theft was reported.

"I saw a woman seated on the ground under the shade of one of the cotton sheds; her left leg was tucked under her seat, and her foot turned sole upwards; between her big toe and the next was a spindle about eighteen inches long, with a single fly of four or six inches. Ever and anon she gave it a twist in a dexterous manner, and at its end was drawn a coarse cotton thread. This was their spinning jenny. Led on by this primitive display, I asked for their loom, by pointing to the thread and then to the blanket girt about the woman's loins. A fellow stretched in the dust, sunning himself, rose up leisurely, and untied a bundle which I had supposed to be a bow and arrows. This little package, with four stakes placed in the ground, was the loom. He laid open his cloth, and commenced the process of weaving."

Each alternate thread of the warp is passed round a piece of cane, which, when lifted, opens a passage for the shuttle in the manner of a sley. The operator sits like a tailor, and, raising the sley with one hand, shoots the shuttle through with the other. The work is beaten up after the passage of each thread by the use of a sharp-toothed instrument made of hard wood. Such an operation is, of course, most tedious, and it is not surprising that even the very limited trade at present existing between the Indians and the outer world, should have caused its abandonment, as well as that of the cultivation of cotton.

The pottery manufactured by the Pimas varies in colour from red to dark brown; the articles made are limited to those which are absolutely necessary for domestic purposes. They consist of *ollas*, or vases, of every size, the largest containing about two pailfuls, the smallest half a pint; jars with small apertures resembling bottles, and basins of different sizes and shapes, from a milkpan to a saucer. All are more or less ornamented, and painted with black lines arranged in geometrical figures.

The basket-work is the most meritorious of all their native arts, for although the baskets are made only of willow twigs or of grass, so closely are they plaited that liquids are placed in them as a matter of course, and seldom a drop escapes through the sides. A wicker rim is always fastened at the bottom, by which the larger baskets can be carried on the head like the vases, and the smaller ones can stand securely on the floor. They are of all sizes, and together with the pottery, form the great articles of exchange between this people and other tribes, the Mexicans being about the best customers of all.

Their only native weapons are bows and arrows, but they readily adopt all modern appliances either in the shape of fire-arms or implements of agriculture. The United States Government has, through its agents, supplied to them a considerable quantity of the latter during the last few years, by which means the annual produce of their farms has been greatly increased. As the ground is soft and friable, hoes, spades, and shovels are more in vogue than ploughs; and when any part of the valley shows signs of exhaustion, they give it rest, repair the old acequias which had previously been abandoned, and thus bring a reinvigorated patch of waste land again under cultivation.

Altogether, I may safely say that the present state of this industrious people is very satisfactory. Want is unknown amongst them; they are happy and contented; they are of great assistance to the colonists as well as to the government, for they help to confine the Apaches to their mountain retreats, and they supply the emigrants and troops with large quantities of corn. By the table of population already given, it will be seen that the women and children form a very fair proportion of the population; as for the latter, my friend Colton tells me that the whole valley swarms with them, and that these little monkeys are as full of fun as they can be. All this is encouraging, and leads us to hope that this people may escape the general destruction which, in North America especially, has fallen upon the aboriginal tribes with the advance of the Anglo-Saxon race. To attain so desirable a consummation two things are absolutely necessary:

First, that the government should make their lands by law inalienable.

Second, that the high standard of morality, which has ever been remarkable amongst the Pimas and their neighbours, the Pueblo Indians, should not be broken down by any close intercourse with white men and their fire-water.

A word or two now about the Papagos. The Papago country is large in extent, but for the most part a complete desert. It comprises all the country south of the Rio Gila, which lies between the head of the Gulf of California and that extensive cordillera of which the Sierra Catarina forms the most westerly range, and extends for some fifty to a hundred miles into Sonora. All over this tract, wherever there happens to be a stream, a spring, or a little marsh among the barren rock hills which thrust their peaks above the parched and friable ground, or any spot favourably suited for tank irrigation, there you are very likely to find a little colony of Papagos, living, if at home, in huts similar in all respects to those of the Pimas. I have been through their desolate country, and visited many of their villages, and I feel convinced that the hard struggle they have always had with nature to support life in such a region, has done much to develop the energy and manliness of character peculiar to the tribe. As a race, they are the finest specimens of man, *physically*, I have ever seen. On one occasion I met five of them at a ranche, and not one of the party measured less than six feet two inches. If they were not so very dark in complexion, their features would be pleasing, for they have the steady, intelligent eye, and straightforward manners of their more northern brethren, the Pimas.

The most interesting point in connection with them, however, is their mode of life. Like the Yaqui Indians of Southern Sonora, they very willingly leave their homes at certain seasons to gain a livelihood elsewhere. They own flocks and herds in considerable quantities, and they keep large droves of horses, or rather ponies. It is probable that a number of their villages, especially those supplied only by artificial tanks, are uninhabitable from want of water for a great part of the year, so that they are obliged to migrate, to support themselves and their stock during the droughts. Be that as it may, they have become the greatest traders and the most industrious people to be found in the country. When the time for leaving their little patches of cultivated ground around the villages has arrived, some pack their merchandise, consisting chiefly of baskets and pottery similar to those made by the Pimas, on their ponies, and go down to Sonora to trade with the Mexicans, driving their stock with them to pasture in the comparatively fertile valleys to the southward. Others travel immense distances over the great Sonora Desert to the Gulf of California, and particularly to some salt lakes about a hundred miles west of Altar, where they lay in a stock of salt and sea-shells, and then return to trade with the Indians on the Colorado, or the Pimas on the Gila; or to sell the salt to the Mexicans on the eastern side of their country. Others, who have no merchandise to sell or ponies to trade with, go to the settlements and ranches from Tucson southward, and willingly hire themselves out as field labourers or miners. They work well for the Americans, and receive usually a dollar a day, which is certainly not bad wages. Then, when the time for planting comes round, they all return again to their own homes in the desert.

The Pimas resisted sternly all attempts made by the Jesuits or Franciscans to convert them, and are now so diffident on religious subjects, that they will not discuss them, or give any information respecting their belief. The Papagos, however, probably from the close intercourse which they have so long kept up with the Mexicans, are, to all appearance, most devout Roman Catholics. A description of, I may say, the cathedral of the tribe, will be found in a subsequent chapter. It is the last relic of the Papago mission of San Xavier del Bac, and is situated on the Rio de Santa Cruz.

Intercourse with the Mexicans has also much modified their mode of dress, for the men usually wear wide straw sombreros of home manufacture, moccasins, buckskin gaiters, a breech-cloth of cotton, and a snow-white cotton blanket thrown gracefully across the chest. The women wear petticoats, and neither sex seems to affect ornaments or paint. The number of villages scattered throughout the land of the Papagos is about nineteen, and the population of the entire tribe probably reaches four thousand, of which three thousand live north of the Mexican boundary line, and perhaps one thousand south of it. So effectually do the warriors protect their homes that the Apaches never have the courage to penetrate far into their country, although they have quite depopulated the Mexican settlements bordering it on the east.

CHAPTER II.

THE WILD TRIBES.

The natural enemies of the cultivators of the soil.—The Navajos, their Depredations.—History during the last twenty years.—Subjugation of the Tribe.—Its present condition at the Bosque Reservation.—The Apaches many distinct Bands.—Ravages of the Mogollon and other Apaches.—The Country depopulated by them.—Walapais.—Yampas.—Indians of the Colorado.

In nature, the productive and the destructive elements are everywhere found side by side, and not only is this true as an abstract principle of actual existence, but there is not a creature without natural enemies who prey upon it and live by its destruction.

Civilised man, however, although he lives by the destruction of life, animal as well as vegetable, takes care to reproduce by artificial means as much as, if not more than, he destroys; the savage, however, does not always do so, and when he does not, this is surely a proof that he is *not* destined by Providence permanently to exist.

Most conspicuous amongst the latter class are the Navajos and Apaches of New Mexico and Arizona—the hereditary enemies of the cultivator of the soil, whether he be Aztec, Mexican, or Anglo-Saxon—the savages by whose means the whole country has been nearly swept of its inhabitants, and changed from a fertile garden into a barren waste.

The Navajos, until lately, occupied a fine tract of country watered by the Colorado Chiquito, the Rio San Juan, and their tributaries, and the western branches of the Rio Grande. They were bounded on the north by the Ute nation, on the south by the Apaches, on the west by the Moqui and Zuñi Pueblos, and on the east by the inhabitants of the Rio Grande valley. Although often placed under the head of Apaches, they are in every respect a different and a finer race. They are bold and defiant, with full lustrous eyes, and a sharp, intelligent expression of countenance; they had fixed abodes in their country, around which they raised crops almost rivalling those of the Pimas on the Gila: they carried one art—the weaving of blankets—to a state of perfection which, in closeness of texture and arrangement of colour, is scarcely excelled even by the laboured and costly seraphes of Mexico and South America. I tried at Santa Fé to purchase some, but the prices were so enormous, averaging from seventy to one hundred dollars for choice specimens, that I refrained.

For love of plunder and rapine these Indians have no equals. Their number, twenty years ago, was probably about twelve thousand, and while they left their wives and old men to plant, reap, attend to the stock, and make blankets, the braves spent their lives in traversing the whole country, carrying off the stock of the helpless Mexican farmers, and keeping the entire agricultural and mining population in a constant state of alarm. To give a slight idea of the depredations of these hordes, I may state that between August 1st, 1846, and October 1st, 1850, there were stolen by them, according to the Reports of the United States Marshals, no less than 12,887 mules, 7,050 horses, 31,581 horned cattle, and 453,293 head of sheep. The official reports from New Mexico appeared to contain nothing but catalogues of depredations committed by the Navajos, or of similar deeds done by the Apaches; and not only was the valley of the Rio Grande swept over and over again of its stock, but the Indian pueblo of Zuñi, and many other native towns, barely escaped destruction, and this too since the annexation. How many perished previously, who can tell?

Governor Charles Bent thus spoke of them in 1846:—"The Navajos are an industrious, intelligent, and warlike race of Indians, who cultivate the soil, and raise sufficient grain and fruits of various kinds for their own consumption. They are the owners of large herds and flocks of cattle, sheep, horses, mules, and asses. It is estimated that the tribe possesses thirty thousand head of horses, mules, and asses. It is not rare for one individual to possess from five to ten thousand sheep, and four or five hundred head of other stock. Their own horses and sheep are said to be greatly superior to those reared by the Mexicans; but a large portion of their stock has been acquired by marauding expeditions against the settlements of this territory. They roam over the country, between the waters of the River San Juan on the north, and those of the Gila on the south. This country is about 150 miles wide, consisting of high table mountains, difficult of access, affording them as yet effectual protection against their enemies. Water is scarce, and difficult to be found by those not acquainted with the country, affording them another natural safeguard against invasion. Their numbers are variously estimated at from one to two thousand families, or about fourteen thousand souls. The Navajos, so far as I am informed, are the only nation on the continent, having intercourse with white men, that is increasing in numbers. They have in their possession many prisoners—men, women, and children—taken from the settlements of this territory, whom they hold and treat as slaves."

Such was their condition in 1846; since then their history has been one long series of misfortunes. As far back as any information can be obtained about them, they have been at war with the Mexicans and white men, the system of reprisals being sytematically carried out on both sides. The Mexicans of one settlement would collect together, and make a raid on a marauding band of Navajos, capturing all they could, not only in stock, but in women and children. The Indians would retaliate, not caring particularly whether it was the aggressors or some peaceful neighbours they attacked in return. This being the state of affairs, we find even as early as the autumn of the first year of possession, that General Kearney (United States army) gave orders to Colonel A. W. Doniphan, then in California, to march against the Navajos; and to Governor Bent, advising him that "full permission should be given to the citizens of New Mexico to march in independent companies against these Indians, *for the purpose of making reprisals*, and for the recovery of property and prisoners."

From this time until 1863 war has been unceasing with this hardy tribe. Their hand has been against every one, and every one's hand has been against them; even the Pueblos left their villages and joined the whites against them; and as they had actual property in corn-fields, flocks, and herds, they could not, like their wild neighbours, the Apaches, who lived by the chase and marauding only, altogether escape from the hands of the military. It was cruel work, however necessary.

I have spoken to many who helped to *humble* the Navajos. As soon as harvest time approached, the soldiers would enter their country, year after year; they say that the corn-fields were splendid, but they cut them all down, and fired the district wherever they went, driving off sheep, sometimes to the number of seventy thousand in a single raid, and oxen also by thousands. When there were no crops to destroy, and no apparent enemy to be found, or flocks to drive off, the military would encamp at the different springs, and try by this means to destroy the remnant of their stock; but in this, for a long time, they were unsuccessful, for the Navajo sheep, probably from force of habit, could thrive if only watered once every third or fourth day, and thus it happened that when the troops had guarded a spring long enough, as they supposed, to prove that no Indians or flocks were in that district, and had left to go to another, the Navajos, who were quietly grazing their cattle in the secluded nooks amongst the hills hard by, came down to the spring and refreshed themselves with perfect impunity.

Year after year they boldly held out, and plunder became to them a necessity of existence, for they had no other means of support. At last, however, this never-ceasing hostility reduced the whole tribe to utter destitution, nor did they give up until they were literally starving. In 1863 the first large section of them—I believe about five thousand in number—delivered themselves up to the government. They were removed from their own country, and placed upon a large reservation on the Rio Pecos, and old Fort Sumner, which had been abandoned, was re-established in the centre of the reservation, for the purpose of carrying out the design of the government towards them. Since then, nearly all the remains of the tribe have delivered themselves up, and to the number of about seven thousand five hundred have been placed on the reservation. Mr. Ward is of opinion that a very small fraction indeed of this once powerful tribe is now at large in the country north of the Rio Colorado, and in Utah Territory; but since, for years before they gave in, the advantage has been on the side of the settlers against the

Navajos, he assures me that there are at the present time not less than two thousand captives in the hands of the Mexicans, who profess to bring them up, and to take care of them as members of their families and households.

As regards the present condition of the Indians on the Bosque reservation, I cannot do better than give a short quotation from the Report of Colonel A. B. Norton (Superintendent of Indian Affairs in New Mexico) for the year 1866:—"At Fort Sumner this tribe has about two thousand five hundred acres of land under cultivation, mostly in Indian corn, with an admirable system of irrigation. The water, however, is very poor in quality, and wood so scarce, that it has to be hauled from twenty-five to thirty miles to the post, while the mezquit root, the only wood used by them for fuel, must soon give out. Add to this that the Comanches make constant raids upon them, to within a few miles of the fort, and as they are very little able to protect themselves, this adds still more to their discontent. Of the state of health and morals of these Navajos, the hospital reports give a woeful account. The tale is not half told, because they have such an aversion to the hospital that but few of those taken sick will ever go there, and so they are fast diminishing in numbers; while the births are many, the deaths are more. Discontent fills every breast of this brave and light-hearted tribe, and a piteous cry comes from all as they think of their own far-off lands, 'Carry me back, carry me back!'" They have had a severe lesson and a terrible punishment, but when a railway traverses the country, they may with perfect safety be allowed to return to their own land, now parched and desolate, but still so yearned for by these unhappy prisoners.

Without further investigation I cannot hazard an opinion as to whether the Navajos are a branch of the town-builders or the true North American redskins. They say themselves that they are related to the former, and their arts as well as their faces would, I think, rather tend to lead us to the same conclusion. Those figured at page 147 look far more like Southern than Northern Indians, and the woodcut is a good copy of a photograph.

While the Navajos spread terror and desolation through the north and east of New Mexico, the Apaches followed the same system of plunder in the southern part of the state, and throughout Arizona and Northern Sonora; with this great difference, that amongst the former booty was their only object, and they spared life unless resistance was offered; but with the latter war to the death was, and still is, their undeviating practice. In battle the Navajo never stoops to scalp his fallen enemy, and many acts of true generosity are related of him; but the cowardly Apache creeps upon his victim like a snake in the grass; if he can capture him he invariably tortures him to death, but otherwise he scalps and mutilates him in the most horrible manner, and has never been known to show the smallest trace either of humanity or good faith.

Several independent though kindred tribes are rightly classed under the term Apaches; the following table gives their names, the localities in which they are usually encountered, and the probable population of each:—

Names.	Districts.	Populations.
Jacarrilla Apaches	Maxwell's reservation and Toas district	500
Mescalero ,,	Mountain South of Fort Stanton	525
	MOGOLLON TRIBES, COMPRISING THE	
Miembres Apaches	Miembres Mountains	400
Coyotero ,,	Sierra Blanca of Arizona	700
Pinal ,,	Pina-leño Cordillera	2,000
Tonto ,,	Between the Rio Salinas and Verde	800
Chi-ri-ca-hui ,,	Chi-ri-ca-hui Mountains	500

The first of these tribes is now quite harmless, and as its members are too few and cowardly to hold their own against the other tribes, they willingly submit to being fed and taken care of at the expense of the government. The second tribe was formerly a very warlike one, and it is chiefly owing to its ravages that the fertile valley of the Rio Grande, from San Antonio, north of Fort Craig, to La Mesilla, a distance of over one hundred miles, is now an uninhabited waste. War, disease, and scarcity of food have of late years so thinned their ranks, that the government succeeded a short time ago in collecting them together and placing them on the Bosque reservation with the Navajos. As these tribes were sworn enemies, they did not long live together, for on the night of November 3rd, 1866, the Apaches deserted, and have since that time been committing depredations on the government stock, and murdering and plundering the settlers so far north as Los Vegas and Galistro. We heard much of their ravages while passing through that district.

All the Mogollon bands are still at large. They mostly inhabit the vast region formed of lofty table-lands and mountain ranges in which the head-waters of the Rio Gila rise; and from these fastnesses, still unexplored, they have for ages been making raids upon their more civilised neighbours on all sides of them.

Some of the depredations of the Miembres Apaches, under their chief, Mangos Colorados, will be found in the second chapter of vol. ii.

A very characteristic tragedy was perpetrated at Fort Bowie while I was there, by Cachees' band of Chi-ri-ca-hui Apaches. This occurrence is related also in the second volume, chap. iii.

It is only necessary here to say a few words about the remaining sub-tribes—the Coyoteros, Pinals, and Tontos. Very little is known about themselves, far too much about their ravages. Their numbers are very variously estimated, but the general belief is that they are not numerous. They occupy the centre of the Apache country, and the few attempts as yet made to "clear them out" have resulted in complete failure. The commander at Camp Grant told me that two years ago he made a raid into their country, but before he had gone many miles he found that his enemies were gathering around him in such numbers that his small force of fifty soldiers had to beat a rapid retreat. One of our parties had a terrible fight with the Tonto Apaches in Northern Arizona. An account of it will be found in chap. xi., vol. ii.

The favourite field for plunder during the last century has been Northern Sonora. The Apaches seem never to have lived there, but their custom was to descend in bands along the whole length of the Pina-leño and Chi-ri-ca-hui Mountains, which, so to speak, form a bridge two hundred miles long across the Madre Plateau from the mountains north of the Rio Gila to the Sierra Madre of Mexico.

The Spaniards protected their outlying provinces from these hordes by a complete system of military posts from San Antonio, in Texas, to the Pacific. These were, along the Rio Grande, the Presidio del Rio Grande, San Carlos, Presidio del Norte, and San Eleazario; across the State of Chihuahua, Carrizal, Cayome, Galeana, and Janos; and across Northern Sonora followed, in close succession, the Presidios of Babispe, Fronteras, Bacuachi, Santa Cruz, and Tubac, reaching to the outskirts of Papago country and the Sonora desert. Thus the Spanish miners and rancheros were protected, and the country south of these limits became rich in flocks, herds, and productive mines, while the population increased with great rapidity. But as the power of Spain declined, and the central government at the city of Mexico degenerated into a chaos of contending factions, the troops which garrisoned these frontier stations were gradually withdrawn; the grand military system, which had so effectually done its work, was allowed to fall into decay, and most of the presidios were relinquished altogether.

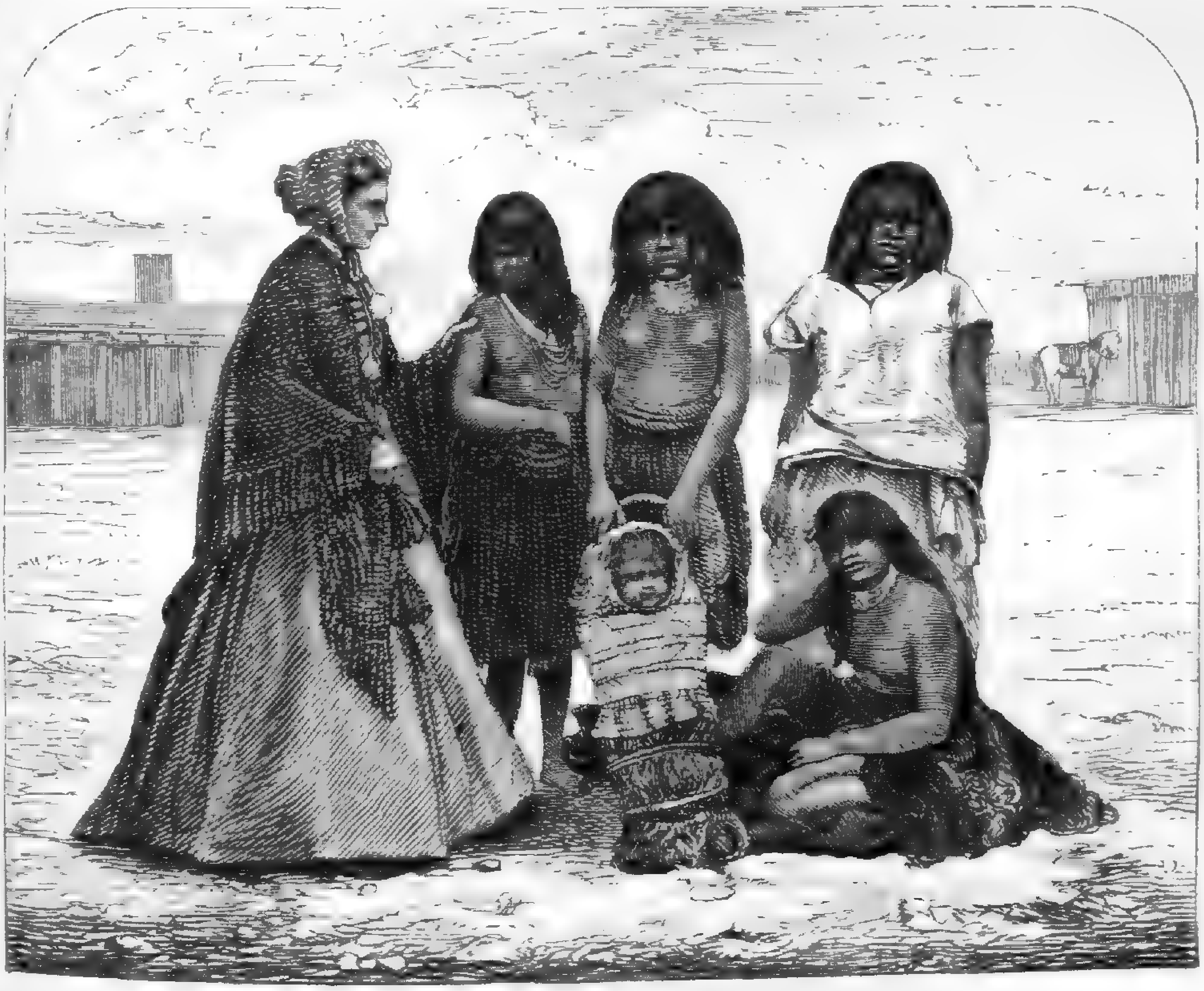
The Apaches were not long in discovering the weakness of their wealthy neighbours, and year by year their raids became more numerous, and their ravages more destructive. At first the stock of the outlying rancheros fell a prey to the enemy, and, although probably but a small proportion of the vast herds which formerly occupied the rich grazing regions of North-eastern Sonora and Northern Chihuahua were really carried off by the red men, the rancheros had to fly for their lives, and leave their cattle to their fate. This accounts for the herds of wild cattle and horses which are still to be found in those districts. Then the miners began to be molested, their stock, chiefly mules, driven off, and they themselves so terrified that they could not be induced to remain. When the country districts were cleared, the little towns next formed the chief objects for attack. The Apaches would lie concealed for days, until an opportune moment had arrived for capturing the cattle and plundering the place. The people at last became so terrified, that if they heard of a band of Apaches fifty miles off, they very frequently left everything and fled. Against such an enemy they were almost powerless, for the mountain fastnesses from which he came lay far away to the north, and anything approaching an open fight was always avoided by him.

This state of things, in fine, going on year after year, has entirely depopulated that country. Its ruin was almost complete before the Treaty of 1854 had finally settled the question of boundary line between Mexico and the United States; but one of the chief stipulations of the treaty was that the latter government should keep the Apaches in their own country, and prevent them from making any more raids into Mexican territory. Although this was promised, it could not be accomplished; for the United States military have, up to the present time, been almost powerless in their attempts either to "wipe out" or to restrain these marauding hordes. They have, as we shall see in many of the incidents to be related, neither protected their own subjects on their own soil, nor sheltered the helpless Mexicans across the border.

But the Apaches do not lay waste Northern Sonora as they formerly did, chiefly because there is now nothing to plunder; all is desolation. Destiny, however, seems to be doing what the government has failed to do; it is destroying the Apache nation. Although very few are yearly killed in fight, and the white man has not as yet penetrated into the heart of their country, still they are dying out fast; already the total population, as far as it can be estimated, is so small as to appear at first to be beneath our notice; but the scalp of many a brave settler will yet be taken before these bloodthirsty savages are crushed.

In the region lying between the Rio Verde, which is about the limit of the Apache country and the Rio Colorado, two tribes, few in number, and of the lowest type of humanity, are met with. These are the Walapais (Hualpais) and the Yampas. The latter chiefly inhabit little strips of marshy land at the bottom of the deep cañons, which debouch upon the Colorado Cañon. Both tribes were encountered by our parties about the 35th parallel; they are comparatively harmless, and much resemble the Pai-utes of the Great Basin. The valleys of the Colorado, from the end of the Black Cañon almost to the head of the gulf, are inhabited by Indian tribes who occupy an intermediate position between the semi-civilised Pueblo Indians and the wild Apache races.

They have for some time kept peace with the whites, but contact with them appears to be rapidly hastening their extinction. As there is no special interest attaching to these savages I will leave the accompanying woodcut, copied from a photograph taken at Fort Mojave, to speak for itself. The Mojaves are the largest tribe, and once numbered ten thousand souls.



Mojave Indians.

CHAPTER III.

THE AZTEC RUINS OF NEW MEXICO AND ARIZONA.

The Ruins may be divided into three classes:—*Ruins on the Rio Grande Valley:* Ruins of Pecos, Quarra, Gran Quivera, and Abo. *Ruins on the Southern Tributaries of the San Juan River:* Pintado, Una Vida, Wegigi, Chetho Kette, Hungo Pavie, and Bonito. *Ruins on the Colorado Chiquito and Tributaries:* Ruins near Zuñi, north-west of the Moquis, Pueblo Creek, &c.; Ruins on the northern branches of the Rio Gila, on the Salinas, Rio Verde, San Carlos, &c.; in the Gila Valley, and on the Streams south of it; Casa Montezuma and Casas Grandes; lastly, Casas Grandes and Casa Janos, in Chihuahua.

I MUST now say a few words about the ruins which are to be found scattered throughout New Mexico, Arizona, and Northern Mexico. There is scarcely a valley in the Rio Grande basin in which the stone or adobe foundations of villages are not to be found; there is scarcely a spring, a laguna, or a marsh upon the plateau which is not overlooked by some ruined fortress. Usually these relics crowned a commanding eminence, not always in close proximity either to the fertile land which supported the community, or even to the spring which supplied them with water. If a stream runs near them, the remains of acequias, or irrigating canals, are generally to be found. There are many places, however, where cultivation had been successfully carried on without them, the rainfall alone being relied upon; while some ruins show signs of reservoirs and terraces similar to those still in use amongst the Moquis.

The ruins may be classed under three heads:—

1st. Ruins of many-storied Indian strongholds.

2nd. Ruins of buildings evidently constructed under Spanish rule.

3rd. Ruins, the foundations of which alone remain.

East of the Rio Grande, there are at least four ruined towns of the first order deserving of special notice: these are the ruins of Pecos, Quarra, Gran Quivera, and Abo; all, however, contain ruins of Spanish as well as Indian origin. The early Spaniards tell us that Pecos was a fortified town of several stories. It was built upon the summit of a mesa which jutted out into the valley of the stream of the same name, and overlooked the lowlands for many miles in both directions. The only conspicuous buildings now to be seen amongst the ruins are the Spanish church and the Mexican temple. For probably a century the two religions flourished side by side; the incense ascended from the altar of the one, and the fire of Montezuma burned day and night in the estufa of the other. The church is a cruciform adobe structure, the greater part of the walls of which are still standing. Montezuma's church, the ruins of which are almost continuous with those of its rival, is much more decayed; it shows signs of having been at least three stories in height, and in the centre the large circular estufa is quite perfect.

The pueblo was called by the early Spaniards "Tiguex," and was the chief town of a district known by the same name. According to Indian tradition, it was built by Montezuma himself on his way southward from Toas; he placed his sacred fire in the estufa, and warned his people that death would come upon them if they allowed it to go out. Before leaving them he took a tall tree and planted it in an inverted position, saying that when he should disappear a foreign race would rule over his people, and there would be no rain. "They were not to lose heart, however, under the foreign yoke, nor to let the fire burn out in the estufa, for when the time came in which the tree should fall, men with pale faces would pour into the land from the east and overthrow their oppressors, and he himself would return to build up his kingdom; the earth would again become fertile, and the mountains yield abundance of silver and gold. Then Montezuma departed and travelled southward, spreading pueblos far and wide, until he reached the city of Mexico, where he lived until the enemy, in the form of the Spaniards, arrived, when he disappeared." The Pueblo Indians say that Montezuma's prophecy has been literally fulfilled. Soon after Montezuma returned to the Great Spirit, the enemy, in the form of Spaniards, came, conquered, and enslaved them. Although they could not shake off the oppressors, still they kept the holy fire burning, and tried to dwell in peace with all men.* The Spaniards added many buildings to the town, and lived there amongst them until about the middle of the last century, when the wild Indians of the mountains attacked and desolated Pecos, driving away and murdering its inhabitants. Nevertheless, amidst the havoc and plunder of the place, a faithful few amongst the Indians managed to keep the fire burning in the estufa, until at last the deliverers with "pale faces poured in from the east," and the tree at Pecos fell to the ground as the American army entered Santa Fé. Then the little remnant of the tribe, which in 1808 only numbered 135 souls, left the ruined fortress and brought the sacred fire with them to the pueblo of Jemez, to which place their companions had migrated years before. Here they were kindly received by the Indians of that pueblo, who helped them to build acequias and houses, and to sow and gather in their crops; droughts no longer desolate the land, but, year after year, copious showers still bring wealth and happiness to the chosen people of the Great Prince.

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* "A Mr. Vaughan, who lived near Pecos, at Tagique, for twenty years before the Americans entered the country, told Lieutenant Abbot that he had seen the sacred fire."—Senate document, No. 41. Appendix vi.

I passed Pecos on my way to Santa Fé. Mr. Eicholtz's party saw the ruins of Quarra and Abo, on their journey through Abo Pass, and left the Gran Quivera a few miles to the eastward; for these three pueblos lie within a radius of ten miles.

The ruins of Quarra consist, like those of Pecos, of a church, a large Aztec building, which was probably several stories high, although now a heap of stones and rubbish, and numerous foundations of smaller houses, probably of Spanish or Mexican origin. The church is built of red sandstone, in the form of a cross; the length of nave and chancel is 140 feet, that of the transept is 50; the widths respectively are 33 to 18 feet; the walls are but 2 feet thick and 30 feet high.

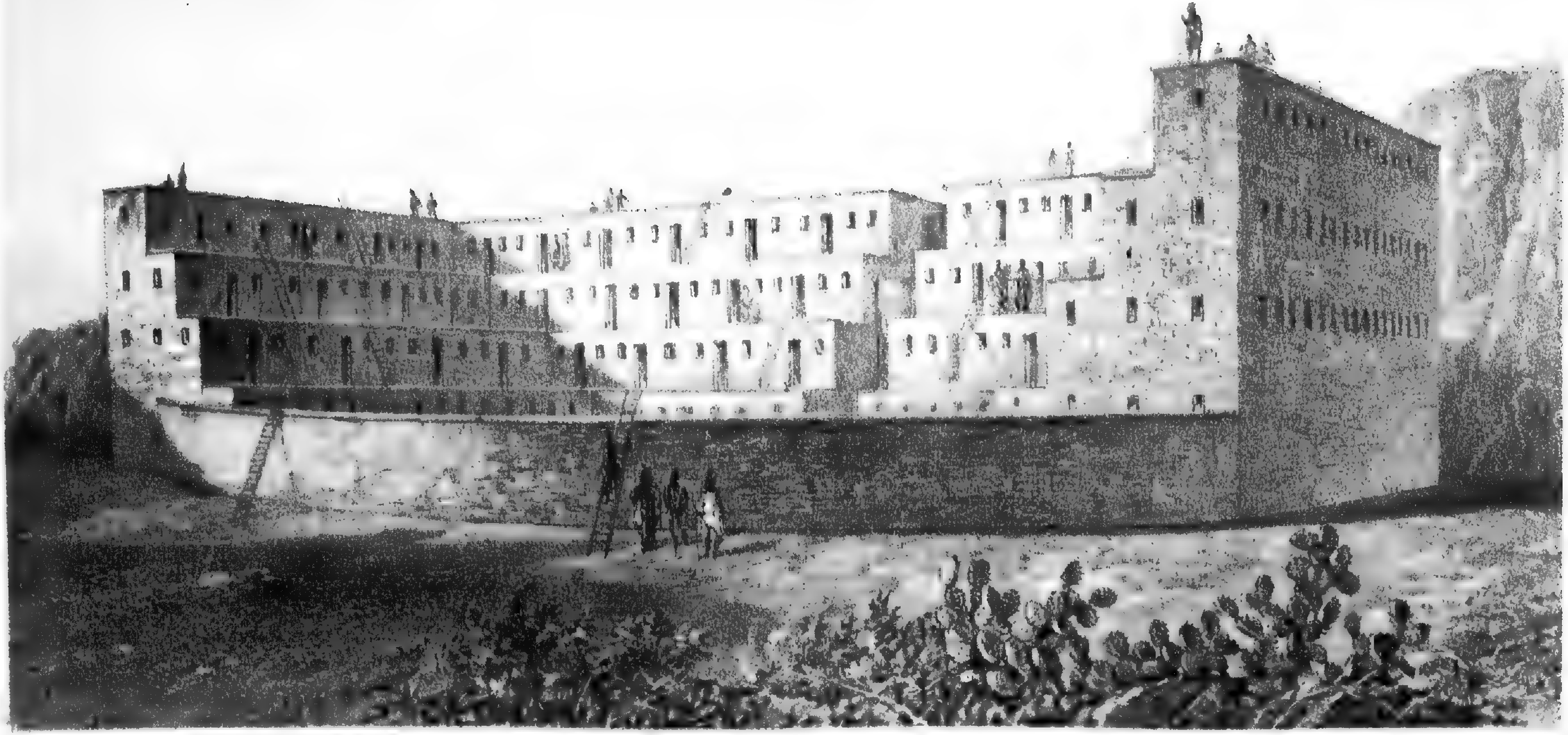
At Abo there is also a ruined church, cruciform in shape, he arms being respectively 27 and 129 feet; it is built of small, beautifully-cut stones, placed together with the utmost nicety. Other extensive ruins are scattered around it.

At Gran Quivera there are extensive ruins of Spanish buildings, having upon them the arms of different families; but there are other ruins undoubtedly of Indian origin, which fully carry out the statement of the historian Venegas and others, that this ancient pueblo was a large fortress, consisting of seven terraces, rising in steps one from the other. The emains of large acequias are to be seen in the vicinity both of Gran Quivera and Quarra. So much for the ruins of the Rio Grande basin.

There are not, to my knowledge, any ruined pueblos as far north as the main valley of the Rio San Juan, but there are several upon the two most southern tributaries—the Rio de Chelly and the Cañon de Chaco. The most remarkable are the pueblos Pintado, Una Vida, Wegigi, Hungo Pavie, and Bonito, all on the latter stream. Besides these there are five others in a more ruined state. The Pueblo Pintado has three stories, its whole elevation being about 30 feet. The walls are built of small flat slabs of grey, fine-grained sandstone, 2½ inches thick, and are put together with much art and ingenuity by means of a kind of mortar made without lime. At a distance they have the appearance of mosaic work. The thickness of the outer wall of the first story is 1 yard at the base, diminishing at each successive story, until the top wall scarcely exceeds 1 foot. There are, as usual, no external openings in the ground floor. The length of the edifice is 390 feet; the ground floor contains fifty-three rooms, which open into each other by means of very small doors, in many instances only 33 inches square. The floors are made of rough beams, over which transverse cross-beams are laid, and above all is a coating of bark and brushwood covered over with mortar. The wood appears to have been cut with some blunt instrument.

The ruins of Wegigi are similar to those of Pintado, being 690 feet in length, and having ninety-nine rooms on the ground floor. The Pueblo Una Vida is no less than 984 feet long, and the Pueblo Bonito is still more extensive. The estufa of the latter is very large, and in a fair state of preservation. It is 180 feet in circumference, and the walls are regularly formed of alternate layers of small and large stones, held together with mortar.

Another pueblo, Chetho Kette, measures 1,300 feet in circumference, and was originally four stories high. It has the



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remains of one hundred and twenty-four rooms on the first story. The most perfect of the ten ruined pueblos discovered by Lieut. Simpson in the Cañon de Chaco is that of Hungo Pavie (or the Crooked Nose). Its circumference, including the enclosed court, is 872 feet. It faces, as usual, the cardinal points, and contains one estufa, placed in the centre of the northern wing of the building.

The accompanying engravings are taken from Simpson's "Navajo Expedition," and show at a glance the form of these structures. The terraces of Hungo Pavie are here represented as facing the central court. This may have been the plan adopted in many pueblos, but not in all. At Zuñi, for instance, the terraces face outwards and rise in steps towards the centre, and while the ruins in the Cañon de Chaco seem to show that there the outermost wall was the highest, many ruins elsewhere prove that the opposite was often the case. Thus two forms were probably in use: the one rose from without in steps towards the centre of the building, the other faced the courtyard, and was encircled by its highest wall.

One or more estufas have been discovered in each pueblo. Some are rectangular; others circular. There are similar ruins in the Valle de Chelly. The Navajo Indians, in whose country these pueblos are situated, say, I am told, that they were built by Montezuma and his people at the time of their emigration from north to south, and shortly before their dispersion on the banks of the Rio Grande, and over other parts of Mexico.

The country occupying the fork between the Great Colorado and the Colorado Chiquito forms a part of that vast tableland, the Colorado Plateau, through which both these streams pass in deep cañons.

The land is deeply eroded, being cut up into lofty mesas of variable size, and is very arid and worthless. The seven Moqui villages crest the edges of some of the mesas which form the south-eastern escarpment of the Colorado Plateau. Further to the north-west, and nearer the Colorado, there is another group of pueblos in ruins, larger than those of the Moqui Indians, but situated, like them, on the flat summits of mesas, containing estufas, reservoirs, terraces, aqueducts, and walls of at least four stories high. No trace has as yet been found of their former inhabitants.

Next we come to the ruins on the Colorado Chiquito and its southern tributaries. There are ruins upon El Moro, ruins north of Zuñi, Old Zuñi, and others along the Zuñi River; ruins, also, on the Rio Puerco of the West, amongst which our parties found abundance of pottery; and there are most extensive ruins in the main valley, both above the falls and between the falls and the entrance of the cañon of the Chiquito, scattered along a fertile basin of at least a hundred miles in length. At Pueblo Creek the remains of several fortified pueblos were found, crowning the heights which command Aztec Pass; but west of this point (longitude 113° west) no other ruins have as yet been discovered.

Leaving the basin of the Colorado Chiquito, we pass southward to that of the Rio Gila, where the most extensive ruins of all are to be found. Some fine streams enter this river on the north, draining a country very little known, but of great interest, and containing many fertile valleys. The chief of these tributaries are the Rios Preito, Bonito, San Carlos, Salinas, and Rio Verde, which latter two unite before joining the Gila, twelve miles from the Pima villages, and lastly, the Agua Fia. The great New Mexican guide, Leroux, started northward from the Pima villages in May, 1854, crossed over to the junction of the Salinas with the Rio Verde (also called Rio de San Francisco), ascended the latter stream, and crossed from it to the 35th parallel route along the Colorado Chiquito. He represents the Rio Verde as a fine large stream, in some places rapid and deep; in others, spreading out into wide lagoons. The ascent was by gradual steppes, stretching out on either side into plains which abounded in timber—pine, oak, ash, walnut, sycamore, and cotton-wood. The river banks were covered with ruins of stone houses and regular fortifications, which were evidently the work of a very civilised race, but did not appear to have been inhabited for centuries. They were built on the most fertile tracts of the valley, where were signs of acequias and of cultivation. The walls were of solid masonry, of rectangular form, some twenty or thirty paces in length, and from 10 to 15 feet in height. They were usually of two stories, with small apertures or loopholes for defence when besieged, and reminded him strongly of the Moqui pueblos. The large stones of which these structures were built must often have been transported from a great distance. At one place he encountered a well-built fortified town, ten miles distant from the nearest water.

Other travellers and prospectors report many ruined pueblos along the Salinas, others on the San Carlos, and several very extensive ones in the fertile Tonto basin, which is drained by a tributary of the Salinas. Of many of the ruins on the Gila itself, and in the valleys of its southern tributaries, I can speak from personal knowledge. A little west of the northern extremity of the Burro Mountains, the Rio Gila leaves the Santa Rita and other ranges, and meanders for a distance of from seventy to one hundred miles through an open valley of considerable width. This long strip of fertile bottom-land is studded throughout with deserted pueblos, which, at the present time, belong almost entirely to the third class—viz., those of which the foundations alone mark the localities. It is impossible to travel more than a mile or two along the margin of the lowlands without encountering them, and one of our guides, who knew the ground well, told me that at least one hundred thousand people must at one time have occupied this valley. The ruins follow the river quite to the mouth of the first cañon by which the Gila cuts through the Pina-leño Mountains.

In the cañada of the Aravaypa, on the western side of this range, I examined the ruins of two pueblos, one being a fortification covering the top of a steep hill which guarded the entrance to the Aravaypa Cañon. All along the San Pedro valley, through which Mr. Runk's party travelled for 160 miles, ruined pueblos were frequently met with. Amongst them the remains of pottery, such as is generally used by the town Indians and Mexicans, were picked up in great abundance. Remains of acequias also were very numerous. Between Camp Grant, where I left my party to enter Old Mexico, and the Pima villages, the mesas bordering on the Gila are pretty thickly studded with ruins, but further west than the confluence of the Rio Verde no more traces of pueblos are to be found.

Two good-sized ruins are situated near the Pima villages; one is known as Casa Montezuma, the other as Casa Grande. Casa Montezuma, also called Casa Blanca, consists of the remains of four large houses, one of which is tolerably perfect as a ruin. Around it are piles of earth showing where others had been, and although ten miles distant from the river, all the intervening space is intersected by acequias, and was no doubt once under cultivation. The chief ruin is four stories high, and 40 feet by 50 wide; the walls face the cardinal points, and there are four estufas 4 feet by 2 in size. The rafters inside were almost entirely destroyed by fire, but as far as could be seen they had been very roughly hewn. The walls consisted of brick, mortar, and pebbles, smoothed without and plastered within. The arrangements of the rooms, the presence of doors, and the absence of terraces would lead one not to attribute this building to Aztec origin. The Pimas, however, account for it thus:—Long ago a woman of exquisite beauty ruled over the valleys and the region south of them. Many suitors came from far to woo her, and brought presents innumerable of corn, skins, and cattle to lay at her feet. Her virtue and determination to continue unmarried remained alike unshaken, and her store of worldly possessions so greatly increased, that when drought and desolation came upon her land, she fed her people out of her great abundance, and did not miss it, there was so much left. One night, as she lay asleep, her garment was blown from off her breast, and a dew-drop from the Great Spirit fell upon her bosom, entered her blood, and caused her to conceive. In time she bore a son, who was none other than Montezuma, and who built the large casas and all the other ruins which are scattered through the land.

After instructing his people in the arts of civilisation he departed for the South, and then disappeared.

Casa Grande is situated a little below the junction of the Rio Verde and the Salinas. It is a rectangular ruin, 220 feet by 68 feet, whose sides face the cardinal points. The highest walls are, as usual, to be found in the centre of the pile, and they appear to have been three or four stories high.

Besides abundance of broken pottery, we found sea-shells, often pierced and otherwise converted into ornaments, about the ruins which skirt the Gila and neighbouring streams, showing that these people must have had some intercourse with tribes living along the coast. These shells may have been brought by tribes inhabiting the Lower Colorado across the Sonora Desert, to exchange for food, clothing, and other Pima manufactures; but I think it most probable that the kindred race, the Papagos, were the chief venders of shells, for they are great traders, and wander through all Northern Sonora, from the Gulf of California to the Sierra Madre, and even now supply the scanty population of this region with sea-salt obtained from some salt lakes near the coast.

The Pimas themselves state positively that at one time they were a great and powerful nation, living in houses similar to the ruins found on the Gila; but after the destruction of their kingdom they travelled southward, settled in the valley where they now dwell, and, fearing lest they should again become an object of envy to a future enemy, were content ever afterwards to live in huts.

Lastly, I would mention one more cluster of ruins which, although they lie south of the boundary line of the United States, belong without doubt to the same class as those I have been considering; these are the Casas Grandes and Casa de Janos, situated on the Rio Casas Grandes, which flows northward into the Laguna de Guzman in North-western Chihuahua. The former, according to the historian Clavegero, is similar in every respect to the ruined fortresses of New Mexico, consisting of three floors, with a terrace above them, and without any entrance to the ground floor. The doors led into the buildings on the second floor, so that scaling ladders were necessary. A canal, says Dr. Wislizenus, conveyed water from a spring to this place. A watch-tower, probably Casa Janos, stands two leagues to the south-west of it, commanding a wide extent of country, and along the stream are many mounds in which have been found earthen vessels, painted white, blue, and violet; also weapons of stone, but none of iron. The following particulars are from Bartlett's personal narrative:—"The ruins of Casas Grandes face the cardinal points, and consist of fallen and erect walls, the latter varying in height from 5 to 30 feet, projecting above the heaps of ruins which have crumbled to decay. Were the height estimated from the foundations, it would be much greater, particularly of those of the centre part of the building, where the fallen walls and rubbish form a mound 20 feet above the ground. If, therefore, the highest walls now standing have their foundations on the lowest level, their probable height was from 40 to 50 feet. I conclude that the outer portions of the building were the lowest, about one story high, while the central ones, judging from the height of the walls now standing, and the accumulation of rubbish, were probably from three to six stories. Every portion of the building is made of adobe, which differs from that now made by the Mexicans in that the blocks are very much larger, being 14 or 16 inches long, 12 inches wide, and 3 or 4 thick; the others are usually 22 inches in thickness, and 3 feet or more in length. Gravel was mixed with these large adobes, which greatly increased their hardness, but no straw was used. The building consists of three masses, united by walls, of probably but one story, forming perhaps only courtyards; they are now weather-beaten down to long lines of mounds.

"The entire edifice extends from north to south 800 feet, and from east to west 250. The general character is very similar to Casas Grandes near the Pima villages and the ruins on the Salinas. Not a fragment of wood remains; many doorways are to be seen, but the lintels have gone, and the top has in most cases crumbled away and fallen in.

"Some of the apartments arranged along the main walls are 20 feet by 10, and connected by doorways, with a small enclosure or pen in one corner, between 3 and 4 feet high. Besides these there are many other exceedingly narrow apartments, too contracted for dwelling-places or sleeping-rooms, with connecting doorways, and into which the light was admitted by circular apertures in the upper part of the wall. There are also large halls, and some enclosures within the walls are so extensive that they could never have been covered with a roof. The lesser ranges of buildings which surrounded the principal one may have been occupied by the people at large, whose property was deposited within the great building for safe keeping. Although there appears to be less order in the *tout ensemble* of this great collection of buildings than in those further north, the number of small apartments, the several stages or stories, the inner courts, and some of the minor details, resemble in many respects the large edifices of the semi-civilised Indians of New Mexico."

The builders showed much sagacity in their choice of so fine a region for agricultural purposes. There is none equal to it from the lowlands of Texas, near San Antonio, to the fertile valleys of California, near Los Angelos; and with the exception of the Rio Grande, there is not one valley equal in size to that of the Casas Grandes, between those of Eastern Texas and the Colorado of the West. The water of the Rio Casas Grandes, unlike that of the Rio Grande, Pecos, and Colorado, is clear, sweet, and sparkling. Not more than one hundred yards' distance is another ruin, about 15 feet square. Garcia Conde says that these edifices were known to have had three stories and a roof, with steps outside, probably of wood. Healos repeats the story of the Aztec emigration, and states that this was the third stopping-place of that people on their way from the North to the city of Mexico.

I met with no Indian ruins in Sonora, nor have I heard of any other similar ones either there or in Chihuahua.

Let us now try to discover, from the writings of a few of the earliest Spanish explorers, what kind of people they found on their discovery of the country. I think I have said enough about the small remnant of civilised Indians still remaining, and of their natural enemies, the wild and untamable savages, to prove what a striking difference exists between them. I have also probably given a longer catalogue of ruins than the patience of my reader has been able to bear. The question, however, of the greatest interest still remains to be answered—viz., Who were the builders of these ruins, and why have they disappeared? The early Spaniards throw considerable light upon this question; and I think, after hearing what they have to say, we may draw a fair conclusion for ourselves. I have neither had time nor opportunity to make researches amongst the long-forgotten archives of Spain or Mexico; but Lieutenant A. W. Whipple has discovered in Colonel Peter Force's extensive library, at Washington, some very interesting matter; a little more material has been added from other sources, and I collected many additional facts at Santa Fé during my fortnight's visit there. I may also add that the second, third, and fourth letters of Fernando Cortez to the Emperor Charles V. were translated in America by George Tolson (New York, 1843, 8vo.), and that the fifth letter has just appeared in the "Journal of the Hakluyt Society," by Don Pascual de Gayangos (1868). The first letter has not been translated, because its authenticity is still doubted.

CHAPTER IV.

NEW MEXICO WHEN DISCOVERED BY THE SPANIARDS.

Expeditions of Joseph de Basçonzales, A.D. 1526; of Pamphilo Narvaez and Cabeza de Vaça, A.D. 1527 to 1538; of Friar Marco de Niça, A.D. 1539; of Francisco Vasques de Coronado, Fernando Alarçon, Melchior Diaz, and Garci Lopez de Cardenas, A.D. 1540.—The Rio Colorado discovered by three explorers in the same year, one of whom describes the Great Cañon. —Expedition of Antonio de Espejo.

It is the fashion nowadays to sneer at any undertaking carried out for an *idea*. If some solid advantage cannot be demonstrated mathematically, we are told that it is useless to urge this practical generation to a needless expenditure of energy, capital, or muscle. We now know that the philosopher's stone is a myth, but we are apt to forget that chemistry owes its origin to the labours expended in trying to discover it. No civilised nation would dream in this the nineteenth century of upholding at the point of the sword any peculiar set of religious dogmas; yet what force has been more potent all over the world; what influence has determined the fate of greater nations, or swept bare and repopulated vaster regions with alien races, than that of religious fanaticism? But is it really true that we have become so material, so un-idealistic, that we can no longer be stimulated to great deeds by the force of moral influence alone,—that no belief has sufficient hold upon us to make us leave the farm or the workshop, and willingly buckle on the sword to fight in its defence? Emphatically, no! The most destructive war of modern times was as absolutely fought for an idea as the wars of the Crusaders and the siege of Troy.

Until the moral conviction that slavery was a curse to the Anglo-Saxon race had taken deep root in the hearts of the American Republicans there was slight chance indeed of their crushing the Southern Confederacy; but when the masses in the North were thoroughly roused, and invited to sell their lives for an idea pure and noble in itself and worthy of any sacrifice, the best men from all sides rushed into the ranks, bringing such new life and fixed determination with them, that the ultimate fate of the Confederacy was no longer doubtful. Since, then, the present is not, after all, so very unlike the past—especially in the springs of action which lead to the greatest events—we can share the feelings of the early Spaniards when they performed feats of almost superhuman strength and daring in their efforts to wrest their ideal El Dorado from the pagan world.

Early in the spring of 1526—ninety-four years before the landing of the Pilgrim Fathers in New England, and thirty-four years after the shores of St. Salvador delighted the eyes of Columbus—Don Joseph de Basçonzales crossed the centre of Arizona towards the Great Cañon, and penetrated at least as far as Zuñi. No record remains of this, the first expedition into that country, but the bare memento of the fact carved on the side of "El Moro;" for none of the expedition ever returned to tell of their adventures. They perished either by the hands of the Indians, or met a more miserable end amongst the labyrinths of chasms still further north, across which nought living but the birds can successfully pass.

Those who remember the wonderful achievements of Cortez in Mexico may call to mind one Pamphilo Narvaez, who in 1520 was despatched by Velasquez, Governor of Cuba, with a detachment to arrest Cortez in the midst of his victories, and to deprive him of authority. Cortez was then in the city of Mexico, beset with many and appalling difficulties. Nevertheless, he marched at once with a few trusted comrades towards the coast, attacked Narvaez with one furious onslaught, overcame him, and took his whole detachment prisoners. "Esteem it great good fortune," said Narvaez, "that you have taken me captive." Cortez disdainfully replied, "It is the least of the things that I have done in Mexico." This was the Narvaez who afterwards obtained from Charles V. the right to make extensive conquests and explorations north of the Gulf of Mexico.

In the winter of 1527-28 he fitted out an expedition, consisting of four hundred men, eighty horses, and five ships, left San Domingo, and, after a prosperous voyage, reached the coast of Florida about the middle of April. There, while carrying on explorations in the interior, he was deserted by his squadron, and obliged to put out to sea in five rude boats made by his famished soldiers. His usual bad fortune, however, followed him; he was wrecked on one of the islands at the mouth of the Mississippi, and perished with all his companions save three: these were Cabeza de Vaça, treasurer and second in command; Esteva Dorantes, an Arabian negro; and Castillo Madonado. Vaça was a man of letters, and of great strength of character, and boldly determined at all hazards to advance into the unknown regions before him, and strike, if possible, the Pacific coast. He was taken prisoner, however, by the wild Indians of Southern Texas, and remained a captive for six years. After that time the three adventurers made their escape, and after travelling for twenty months in a north-westerly direction, amongst hostile tribes and over arid deserts, they struck the

Canadian River. This they followed in a westerly direction, and passed over the dividing ridges into the valley of the Rio Grande. After wandering from pueblo to pueblo, they at last made their way, in the month of May, 1538, to the village of San Miguel, in Sonora, scarcely sixty leagues from the Pacific coast, and finally reached the city of Mexico. Vaça returned next year to Spain, and laid before the King a thrilling narrative of his adventures. His description of the large towns with lofty houses containing many stories, which he had heard of in the Rio Grande valley, of the civilised Indians who cultivated maize and adorned themselves with precious stones, and of the mineral wealth which he had discovered, soon led to the organisation of a fresh expedition.

On the 7th March, 1539, Friar Marco de Niça started from the town of San Miguel, in the province of Culiacan (Sinaloa), on his journey northward, according to instructions received from Don Antonio de Mendoça, Viceroy of New Spain. His companion was Friar Honoratus, and he carried with him a negro named Stephen, and certain Indians of the town of Cuchillo, whom the Viceroy had made free. He proceeded to Petatlan, where he rested three days, and left his companion, Honoratus, sick. Thence, "following as the Holy Ghost did lead," he travelled twenty-five or thirty leagues, seeing nothing worthy of notice, saving certain Indians from "the Island of Saint Iago," where Fernando Cortez of the Valley had been. From these he learned that among the islands were "great stores of pearls."* Continuing through a desert of four days' journey, accompanied by the Indians of the islands and of the mountains through which he passed, he found other Indians, who marvelled to see him, having no knowledge of any Christians, or even of the Indians from whom they were separated by the desert. They entertained him kindly, and called him "Hayota," in their language signifying a man come from heaven.* He was told by these people, whom Vasquez Coronado had named Coraçones, that four or five days' journey within the country, at the foot of the mountains, "there was a large and mighty plain, wherein were many great towns, and people clad in cotton." And when he showed them certain minerals which he carried, "they took the mineral of gold," and told him "that thereof were vessels among the people of that plain, and that they carried certain round green stones hanging at their nostrils and at their ears, and that they had certain thin plates of gold wherewith they scrape off their sweat, and that the walls of their temples are covered therewith." But as this valley (previously called a plain) was distant from the sea-coast, he deferred the "discovery thereof" until his return.†

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* These were probably Yaqui Indians, who still visit the Pearl Islands along the opposite shore (Lower California), in order to carry on their occupation of diving for pearls. They are great travellers, and would therefore be valuable guides.

Marco de Niça travelled three days through towns inhabited by the people of the Coraçones, and then came to a "town of reasonable bigness,"‡ called Vacupa, forty leagues distant from the sea. The people of Vacupa, he states, showed him "great courtesies," and gave him "great store of good victuals, because the soil is very fruitful, and may be watered." Here the negro, Stephen, was sent in advance to reconnoitre. At the end of four days Father Marco received a message from

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* These were Opita Indians, occupying the valley either of the Rio Sonora or its main tributary, the Rio de San Miguel. They received me as hospitably as they did Father Marco, and are the best-looking Indians I have ever seen. For a description of the desert, which I also traversed, see chapter vii., vol. ii.

† These "great towns" were probably situated in the Casas Grandes valley (a description of some of the ruins of which has been given), and, no doubt, were famous cities amongst the Indian tribes.

‡ "Magdalena, on the Rio de San Miguel."—(*Whipple.*)

Stephen, stating that wonderful accounts had been told him of a great city, called Cevola, thirty days' journey distant. The negro pushed on without waiting as he was ordered, and succeeded in making the discovery of that people, who finally killed him.

Upon the same day that Niça received these messages from Stephen, there came to him three Indians of those whom he called Pintados, because he saw their faces, breasts, and arms painted. "These dwell further up into the country, towards the east, and some of them border upon the seven cities."* With these Pintados he departed from Vacupa upon Easter Tuesday; and having travelled three days northward, the way that Stephen had gone before him, he was informed that a man might travel in thirty days to the city of Cevola, which is the first of the seven. He was told also that, besides the seven cities, there were three other kingdoms, called Marata, Acus, and Totonteac. He asked of these Indians why they travelled to Cevola, so far from their houses. They said that they went for turquoises, ox-hides, and other things, which they received in payment for labour in tilling the ground.† They described the dress of the inhabitants of Cevola to be "a gown of cotton down to the foot, with a button at the neck, and a long string hanging down at the same; and that the sleeves of these gowns are as broad beneath as above."‡ They gird themselves with girdles of turquoises,§ and besides these, "some wear good apparel; others, hides of kine,‖ very well dressed." The

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* Without doubt these were Papagos.

† A strong proof that they were Papagos, and not Pimas, or any other tribe.

‡ "This description is simply that of a Pima cotton blanket, thrown over the shoulders and pinned by a wooden button at the neck. The natural folds of this garment would produce 'sleeves as broad beneath as above.'"—(*Whipple.*)

§ Probably Pima or Zuñi belts, ornamented with green stones.

‖ Buckskin or buffalo robes.

Pintados carried certain sick folk to see him, that he might heal them, and the invalids sought to touch his garments for that purpose.

He continued his journey five days, always finding inhabited places, great hospitality, and many "turquoises" and ox-hides. He then understood that after two days' journey he would find a desert where there was no food. Before he reached this desert, he arrived at a very pleasant town, by reason of great stores of water conveyed thither to water the same.* Here he met with many people, both men and women, clothed in cotton, and some covered with ox-hides, "which generally they take for better apparel than that of cotton."† "All the people of this village," he states, "go in *caconados*—that is to say, with turquoises hanging at their nostril and ears, which turquoises they call *cacona*."‡

The "lord of this village" and others visited him, "apparelled in cotton," "in caconados," and each with a collar of turquoises about his neck. They gave him conies, quails, maize, and nuts of pine trees, and offered turquoises, dressed ox-hides, and fair vessels to drink in, which he declined. They informed him that in Totonteac was a great quantity of woollen cloth, such as he himself wore, made from the fleeces of wild beasts. These beasts they told him were about the same size as two spaniels which Stephen carried with him.

The next day he entered the desert, and when he was to dine, he found bowers made and victuals in abundance by a river side.* Thus the Indians provided for him during four days that the "wilderness" continued. He then entered a valley,† very well inhabited with people, who were dressed also in cotton robes, with turquoises pendent from their ears and nostrils, and numerous strings of the same encircling their necks.

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* This was probably St. Xavier del Bac, situated in a rich and fertile valley, watered by acequias from the Santa Cruz River.

† If allowed for "ox-hides" to read *buckskin*, the account will apply to the Papagos and Pimas of the present day.

‡ It is usual for all the principal Indian chiefs of the Gila and Colorado, as well as those of Zuñi, to wear blue stones pendent from the nose.

Through this valley, which was inhabited by "a goodly people," he travelled five days' journey.‡ The country was "well watered and like a garden," "abounding in victuals," "sufficient to feed about three thousand horsemen." The boroughs and towns were from a quarter to half a league long. Here he found a man born in Cevola (Zuñi), having escaped from the governor or lieutenant of the same; "for the lord of the seven cities liveth and abideth in one of these towns called Ahacus (Acoma), and in the rest he appointeth lieutenants under him. This townsman of Cevola is a *white man*,§ of good complexion, somewhat well in years, and of far greater capacity than the inhabitants of this valley, or those left behind." Friar Marco thus describes Cevola *from report*:— "It is a great city, inhabited by a great store of people, and having many streets and market-places; in some parts of this city there are certain very great houses, of five stories high, wherein the chief of the city assemble themselves at certain days of the year. The houses are of lime and stone; the gates and small pillars of the principal houses are of turquoises; and all the vessels wherein they are served and other ornaments of their houses are of gold. The other six cities are built like unto this, whereof some are bigger, and Ahacus is the chiefest of them. At the south-east there is a kingdom called Marata,* where there were wont to be many great cities, which were all builded of houses of stone, with divers lofts. And these have and do wage war with the lord of the seven cities, through which war the kingdom of Marata is for the most part wasted, although it yet continueth and maintaineth war against the other.

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* This "river in the desert" is probably the stream which at times flows from the Cañada del Oro, receiving all the western drainage of the Santa Catarina Mountains, and, like the Rio Santa Cruz, becomes lost in the desert.

† This was the valley of the Rio Gila.

‡ "He must have crossed over the Salinas (Rio Azul) and ascended that river. It is surprising that he makes no mention of large buildings or ruins upon its banks."—(*Whipple.*)

§ "It is remarkable that at the present day many of the Indians of Zuñi are white. They have a fair skin, blue eyes, chestnut or auburn hair, and are quite good-looking. They claim to be full-blooded Zuñians, and have no traditions of intermarriages with any foreign race. The circumstance creates no surprise among this people, for from time immemorial a similar class of persons has existed in the tribe."—(*Whipple.*)

"Likewise the kingdom of Totonteac † lieth towards the west—a very mighty province, replenished with infinite store of people and riches; and in the said kingdom they wear woollen cloth, made of the fleece of those beasts previously described; and they are a very civil people." He told also of another kingdom, called Acus.‡ Here they showed him a hide half as big again as the hide of an ox, which they said belonged to a beast with one horn. The colour of the skin was like that of a goat, and the hair was a finger thick.

The inhabitants requested him to stay here three or four days, because from this place they were "four days' journey into the desert, and from the first entrance into the same desert unto the city of Cevola are fifteen great days' journey more." Accompanied by thirty of the principal Indians, with others to carry the provisions, he entered this second desert on the 9th of May. He travelled the first day by a very broad and beaten way, and came to dinner unto a water, and at night unto another water, where the Indians provided him with a cottage and victuals. In this manner he travelled twelve days' journey. At that point he met one of Stephen's Indians, who, "in great fright and covered with sweat," informed him that the people of Cevola had at first imprisoned and afterwards killed the negro.

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* I believe this to have been in the upper valley of the Rio Gila, where so many ruins still remain.

† Totonteac is doubtless the country lying upon the waters of the Rio Verde and Pueblo Creek. Civilisation and the arts must have made considerable progress there, but the valleys are now quite deserted.

‡ The position of the kingdom of Acus is not mentioned. It may have been upon the Colorado Chiquito, or in the Cañon de Chaco; at both places there are ancient ruins already described.

Father Marco himself then became fearful of trusting his life in the hands of that people. But he told his companions that he "purposed to *see* the city of Cevola, whatever came of it." So he ascended a mountain and viewed the city. He describes it as "situated upon the plain at the foot of a round hill,* and maketh show to be a fair city; and is better seated" than any that he has seen in these parts. The houses "were builded in order," according as the Indians had told him, "all made of stone, with divers stories and flat roofs. The people† are somewhat white; they wear apparel, and lie on beds; their weapons are bows; they have emeralds and other jewels, although they esteem none so much as turquoises, wherewith they adorn the walls of the porches of their houses, and their apparel and vessels; and they use them instead of money through all the country. Their apparel is of cotton and of ox-hides, and this is their most commendable and honourable apparel." They use vessels of gold and silver, for these metals are found in greater abundance here than in Peru. They buy the same for turquoises in the province of Pintados,* where there are said to be mines of great abundance. Of other kingdoms he says he could not obtain such particular information. When he told the Indian chiefs that were with him what a goodly city Cevola seemed, they answered him that it was the least of the seven cities, and that Totonteac was the greatest and best of them all, because it had so many houses and people that there was no end to them. Having set up a cross and made a heap of stones, he named that country El Nuevo Regno de San Francisco. Then, "with more fear than victuals," he returned. In two days he overtook the people he had left behind, crossed the desert, hurried from the valley, and passed the second desert. Having arrived at the valley of the Gila, he determined to visit the great plain he had been informed of towards the east; but for fear of the Indians, did not go into it. At its entrance he saw "but seven towns" of a reasonable size, which were afar off in a low valley,† being very green, and having a most fruitful soil, out of which ran many rivers.

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* This description answers quite well to Zuñi at the present day. See engraving, page 164.

† "The following he would not have seen, but probably states on the authority of his informers."—(*Whipple.*)

Fired by the high-coloured reports brought back by Father Marco, Francisco Vasquez de Coronado, already famed as a great soldier and explorer, determined himself to start for Cevola. His expedition was composed of the flower of Spanish chivalry, and as he marched northward through Sonora by land, Fernando Alarçon, with two ships, was sent up the coast to render assistance should occasion require. It was not known at that time (1540) that Lower

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* In the mountains around Tucsan many gold and silver mines have been discovered, proving that there must have been some foundation for this statement.

† These pueblos have already been referred to; he probably passed the Pinaleño Cordilleras to the eastward, and looked down upon a part of the upper valley of the Gila.

California was united to the mainland, so that Alarçon soon found his progress stopped at the head of the Gulf of California. He ascended the Rio Colorado for eighty-five leagues, and not encountering Coronado, returned by water to New Mexico.

Soon after Coronado had started, one Melchior Diaz set out after him, with twenty-five men. He, however, by directing his course to the westward, also discovered the Colorado, and returned to Mexico by sea, bringing back the first announcement that Lower California was not an island. He described the Indians along the Rio Colorado as being a very tall race, almost naked; the men carrying banners, and bows and arrows; the women wearing feathers and an apron of deer-skin. Their noses were pierced, ornaments hung from their ears, and the warriors smeared themselves with bright-coloured paint.

Nearly at the same time Coronado, having penetrated with his party to Zuñi, despatched one of his officers, Garci Lopez de Cardenas, with a detachment of men to the Moqui villages, and this party made a third discovery of the Rio Colorado, many hundred miles above its source. After travelling for twenty days through a broken volcanic country, where they experienced great scarcity of water, they suddenly came upon a deep cleft in the earth's surface which barred all further progress. Lopez describes it as being deeper than the side of the highest mountain, while the surging torrent below seemed not more than a fathom wide. Two men tried to descend, but after with difficulty climbing down a third of the way they were stopped by a rock, which, although from above it did not appear larger than a man, was, in reality, higher than the tower of the cathedral at Seville. "In no other part of the continent had they seen so deep a gulf, hollowed out by a river for its course." Thus the discovery of the Great Cañon of the Colorado dates back to the year 1540.

Coronado's trip to Cevola does not seem to have been quite as prosperous at first as that of Father Marco. He met with great hardships, and lost many of his horses and men before reaching the Rio Gila, and, after resting there two days, seems to have had great difficulty in making his way through the Mogollon Mountains. "But," he continues, "after we had passed thirty leagues of the most wicked way, we found fresh rivers and grass, like that of Castile, and many nut trees (Piñon pines), whose leaf differs from those of Spain, and there was flax, but chiefly near the banks of a certain river, which therefore we called El Rio del Lino (Colorado Chiquito*). Here he was met by some people of Cevola, who first appeared friendly, but afterwards attacked his army very valiantly. At last he arrived at the walls of Zuñi, and sent messengers thither, but they were ill treated and fired at, upon which, after an attack and skirmish without the walls, he boldly assaulted the city, and, after considerable resistance, took it by storm. The Indians fought with bows and arrows, and threw stones upon them from the walls. Coronado himself was twice unhorsed, but his Spanish armour saved him. Plenty of corn was found in the town, of which they were greatly in need, several persons having starved on the way. "It remaineth now to testify," writes Coronado, "of the seven cities, and of the kingdoms and provinces whereof the father provincial (Friar Marco) made report to your lordship; and, to be brief, I can assure your honour he said the truth in nothing that he reported, but all was quite contrary, saving only the names of the cities and the

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* Still called Flax River.

great houses of stone, whereof there are about two hundred encompassed with walls, and I think that with the rest of the houses which are not so walled there may be together five hundred." In other words, the conqueror found neither silver, gold, nor precious stones, but he gives a very accurate description of the appearance, dress, and mode of living of the people, which does not differ in any particular from that of the present day. "The seven cities are seven small towns, all made with these kind of (many-storied) houses that I speak of; they stand all within four leagues together, and are called collectively the kingdom of Cevola." . . . . "They eat the best cakes I ever saw, and they have the finest order and way of grinding, so that one Indian woman of this country will grind as much as four women of Mexico." . . . . "That which these Indians worship, as far as we hitherto can learn, is the water, for they say it causeth their corn to grow and maintaineth their life." As regards the answers they gave him about other cities, Coronado says that he thinks they do not tell him the truth. They said that they killed the negro, Stephen, because "he touched their women."

After leaving Zuñi, Vasquez de Coronado travelled eastward into the Rio Grande valley, and discovered, or rather re-discovered, the pueblos built upon that stream. Amongst these were Acuco (Acoma), "a town upon an exceeding strong hill," Tiguex (Pecos), Quivera, Axa, and Cicuic, four leagues from which they met with a new kind of oxen (buffalo), wild and fierce, whereof the first day they killed fourscore, which sufficed the army for flesh. "All the way was as full of crooked-backed oxen as the mountain sierras in Spain are of sheep." Nowhere did they find gold, silver, or precious gems; and in the end of March, 1542, Vasquez Coronado, after receiving a severe fall from his horse while tilting at Tiguex, returned in disgust with his army to Mexico. "It grieved Don Antonio de Mendoça very much that the army returned home; for he had spent about three-score thousand pesos of gold, and owed a great part thereof still."

The Abbé Domenec states that as early as the year 1542 the Spaniards had gained possession of no less than seventy-one towns, distributed amongst fourteen provinces,* of which Tiguex formed the centre, and Cevola probably the furthest westward. These provinces, therefore, do not include any of the communities celebrated in those days, such as Totonteac, Moqui, Acus, Marata, &c., which occupied regions far removed from the Rio Grande.

On the 10th of November, 1582, another expedition, headed by a citizen of Mexico, called Antonio de Espejo, left the valley of San Bartolo (160 leagues from the city of Mexico) to explore the Rio del Norte, and to discover the fate of two friars, Lopez and Ruyz, who were reported to have been murdered there.

Directing his course northward, he met with great numbers of Conchos (Papagos), who dwelt in villages or hamlets covered with straw. These Indians went nearly naked, cultivated maize, pumpkins, and melons, and were armed with bows and arrows. They worshipped neither idols nor aught else. The caciques sent information of the expedition from one town to another, and the party was well treated. They passed through the Passaguates, the Zoboses, and the Jumanes, who were called by the Spaniards Patarabueges. "Their villages are upon the Rio del Norte; their houses are flat-roofed, and built of mortar and stone." These people were well clothed, and seemed to have some knowledge of the Catholic faith. Ascending the great river, they discovered another province of Indians, who showed them many curious things made of feathers, with divers colours, and many cotton mantles striped blue and white, like those brought from China. These people showed by signs that five days' journey westward there were precious metals.

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* The provinces were—Cevola, containing 7 towns; Tucayan, 7; Acuco, 7; Tiguex, 12; Cutahaco, 8; Quivix, 7; Sierra Blanca, 7; Ximena, 3; Cicuyè, 1; Hemes, 7; Oji Caliente, 3; Yuque-Yunque, 3; Braba, 1; Chia, 1:—in all 71.

Journeying thence northward along the Rio del Norte, they were well received amongst a numerous population. Here they were told by a Concho Indian who accompanied them, that fifteen days' journey towards the west could be found a broad lake,* and great towns with houses three and four stories high. They noted especially the excellent temperature of the climate, good soil, and abundance of precious metals.

From this province they travelled fifteen days without meeting any one, passing through woods of pine trees bearing fruit like those of Castile.

Having thus travelled eighty leagues, they arrived at villages where there was much excellent white salt. Ascending the valley of the aforesaid great river twelve leagues further, they arrived at the country which they called New Mexico. Here all along the banks of the river grew mighty woods of poplar (cotton-wood), in some places four leagues broad, and great store of walnut trees and vines, like those of Castile. Having travelled two days through these woods, they arrived at ten towns situated upon both sides of the river, where were about ten thousand persons. Here were houses four stories in height, with "stoves for the winter season." They had

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* Probably the Laguna de Guzman and the pueblos on the river which feeds it.

"plenty of victuals and hens of the country." "Their garments were of cotton and deer-skins, and the attire, both of men and women, was after the manner of Indians of Mexico." "Both men and women wore shoes and boots, with good soles of leather—a thing never seen in any other part of the Indies." "There are caciques who govern the people, like the caciques of Mexico, with sergeants to execute their commands. In all their arable grounds, whereof they have great plenty, they erect on the one side a little cottage, or shed, standing upon four poles, under which the labourers eat and pass away the heat of the day, for they are a people much given to labour." "This country is full of mountains and forests of pine trees." "Their weapons are strong bows and arrows pointed with flints." "They use also targets or shields made of raw hides."

After remaining four days in this province, not far off they came to another called the province of Tiguas (Tiguex), containing sixteen towns, in one of which the two friars, Lopez and Ruyz, had been slain. Hence the inhabitants fled. The Spaniards, entering the town, found plenty of food, hens, and rich metals. Here they heard of many rich towns far toward the east. Two days' journey from the province of Tiguas they found another province, containing eleven towns and about forty thousand persons. The country was fertile, and bordered on Cevola, where was abundance of kine. Here were signs of "very rich mines." Having returned to Tiguex, they ascended the Rio del Norte six leagues to another province called Los Quires. Here they found five towns, and fourteen thousand persons who worshipped idols. Among the curious things seen at this place were a pig in a cage and "canopies like those brought from China," upon which were painted the sun, moon, and stars. The height of the pole-star led them to believe themselves in north latitude 37½°.

Pursuing the same northerly course, fourteen leagues thence they found another province, inhabited by Cumanes (or Punames), with five towns, of which Cia (Zia) was greatest, having twenty thousand persons, eight market-places, and houses plastered and painted in divers colours. The inhabitants presented them with mantles curiously wrought, and showed rich metals, and mountains near which were the mines. Having travelled six leagues north-west, they came to Ameies, "where are seven great towns and thirty thousand souls." One of the towns was said to be very great and fair; but as it stood behind a mountain they feared to approach it. Fifteen leagues west they found a great town, called Acoma, containing about six thousand persons, and situated upon a high rock, which was above fifty paces high, having no entrance except by stairs hewed into the rock. The water of this town was kept in cisterns. Their corn-fields, two leagues distant, were watered from a small river, upon the banks of which were roses. Many mountains in this vicinity showed signs of metals; but they went not to see them.

Twenty-four leagues westward from Acoma they arrived at Zuñi, by the Spaniards called Cibola, containing great numbers of Indians. Here were three Christian Indians, left by Coronado in 1540. They informed Espejo that "threescore days' journey from this place there was a mighty lake, upon the banks whereof stood many great and good towns, and that the inhabitants of the same had plenty of gold, as shown by their wearing golden bracelets and earrings." They said that Coronado intended to have gone there, but having travelled twelve days' journey, he began to want water, and returned. Espejo, desirous of seeing this rich country, departed from Cibola, and having travelled twenty-eight leagues west, found another great province* of about fifty thousand souls. As they approached a town called Zaguato, the multitude, with their caciques, met them with great joy, and poured maize upon the ground for the horses to walk upon, and they presented the captain with forty thousand mantles of cotton, white and coloured, and many hard towels with tassels at the four corners, and rich metals which seemed to contain much silver. Thence travelling due west forty-five leagues, they found mines, of which they had been informed, and took out with their own hands rich metals containing silver. The mines, which were on a broad vein, were in a mountain† easily ascended by an open way to the same. In the vicinity of the mines there were numerous Indian pueblos. "Hereabout they found two rivers‡ of a reasonable bigness, upon the banks whereof grew many vines bearing excellent grapes, and great groves of walnut trees, and much flax, like that of Castile."

Captain Espejo then returned to Zuñi. Thence he determined to ascend still higher up the Rio del Norte. Having travelled sixty leagues towards the province of Quires, twelve leagues further east they found a province of Indians, called Hubates, containing twenty-five thousand people well dressed in coloured mantles of cotton and hides. They had many mountains full of pines and cedars, and the houses of their towns were four or five stories high. Here they had notice of another province, distant one day's journey from thence, inhabited by Indians, called Tamos (Toas), and containing forty thousand souls. But this people having refused admittance to their towns, the Spaniards returned, and following 120 leagues down a river called Rio de las Vacas (Rio Pecos), united again with the Rio del Norte, and went homeward in July, 1583. In conclusion, the author adds,—"Almighty God vouchsafe His assistance in this business, that such numbers of souls redeemed by His blood may not utterly perish; of whose good capacity, wherein they exceed those of Mexico and Peru, we may boldly assert that they will embrace the Gospel and abandon such idolatry as now the most of them do live in."

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* Mohotze (Moqui?)

† Probably San Francisco Mountain, near which are large ruins described by Captain Sitgreaves.

‡ Probably the Colorado Chiquito (Rio del Lino) and Rio Verde.

If this account of Antonio de Espejo be a tolerably accurate chronicle of facts, the Rio Grande valley must have been very well peopled. He describes no less than sixteen provinces or kingdoms, and mentions others from hearsay; and if his estimates of population at all approach the truth, there were far more people in that one valley in the sixteenth century than there are now in the whole of New Mexico and Arizona united, including both Mexicans and Americans.

Although the Pueblo Indians seem to have been unacquainted with the working of metals, yet we hear reports of gold and silver being discovered after this time (1582) in many parts of the very country which was reported by its discoverers to be utterly unworthy of colonisation. It would, however, be giving the subject more attention than is here desirable, were I to quote further from Spanish sources, especially as I think the chief object has been already gained, namely, of proving that the towns now in ruins were thickly inhabited when the first Europeans entered the country.

CHAPTER V.

THE RISE AND FALL OF PUEBLO INDIAN POWER IN NORTHERN MEXICO.

The Pueblo Indians come from the South; they subdue the savages and colonise New Mexico.—They discover the Rio Grande at its source, and spread down that valley from the North.—They found populous towns.—The Spaniards subdue and enslave them.—They rebel and are reconquered.—Spanish Grants.—The wild tribes become dominant, and complete the ruin of the Aztecs.—Physical changes in the country.—Conclusion.

LOOKING at the question of the rise and fall of Pueblo Indian power in New Mexico and Arizona from a geographical as well as an historical point of view, I have come to the following conclusions respecting it; but in expressing these views I do not bind myself very closely to them, for I think it quite probable that far more light may some day be thrown upon this interesting subject by others, who will be able to bridge over many gaps in the evidence which now form almost impassable barriers to a complete line of argument.

These town-building Indians, I consider, were the skirmish line of the Aztec race, when that race was united and in the plenitude of its power. They came originally from the southern provinces of Mexico, probably in separate detachments—the restless spirits of semi-civilised tribes, speaking distinct dialects, although more or less united under one central government; and they tried, with all the skill brought from Anahuac and the southern provinces of Mexico, to colonise the outlying countries to the northward. The route taken by these Aztec pioneers was probably that which the physical geography of the country naturally suggests, viz., through the provinces now called Sinaloa and Sonora, west, of course, of the main Cordilleras, to the Gila valley, and thence northward, along the tributary streams of that river towards the Great Cañon of the Colorado. Some followed the Gila, across the Gila desert, to its mouth, and thence up the Colorado, until, attracted by the fertility of some of its valleys, they planted a colony on its banks, and appear to have fraternised to a great extent with the native tribes of that district. And thus it was that Captain Fernando Alarçon, who, in 1540, discovered the Rio Colorado, "having passed various tribes," as he ascended the stream, "without being able to communicate except by signs, at length reached a people who understood the language of an Indian he had brought with him from Mexico, and told him of a similar people who dwelt far to the eastward in great houses built of stone, wore long white robes, and came yearly to the river to buy maize; for their fields were small, whereas the lands along the Colorado being subject to an annual overflow, produced food in abundance." *

The main stream of emigration evidently flowed northward; the rich bottom-lands along the Gila were occupied and placed under irrigation; the valleys of the Rio Verde, Salinas, and other streams were taken possession of; and the Apaches, who probably carried on agriculture to some extent along their banks, were driven into the mountains. These savages were probably treated by the Aztecs as barbarian hordes, whom they found it impossible thoroughly to subdue, but who harassed them perpetually, and obliged them to

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* The tribe here spoken of may be the Mojaves; if so, contact with the neighbouring tribes must have caused them sadly to degenerate, for at present they are polygamists, like the other Colorado tribes, and do not seem superior to them in intellect or manner of living.

devise means of protecting their settlements against surprise, and their rich corn-fields from pillage. Thus they introduced the art of building houses of stone and adobe from Mexico into their newly-acquired territory, and adopted that system of communism in their fortified towns which best suited their purpose. They chose commanding positions upon the summits of the mesas overlooking large tracts of fertile bottom-land, and added story to story in such a manner that a few resolute defenders could keep almost any number of assailants, similarly armed, at bay. The Apaches seem to have been at last so successfully kept under, that Father Marco and Vasquez de Coronado were conducted by the Aztecs through the very centre of a country which is now entirely given over to the savages, and across which no one at the present time would dream of passing. Nor do we hear much about these sons of plunder until nearly the middle of the eighteenth century.

The town-builders gradually pushed their way northward to Pueblo Creek, the Aztec Mountains, and the San Francisco Peaks; but on trying to penetrate further, their progress was suddenly arrested by an impassable barrier—the cañons of the Colorado and Flax (Chiquito) rivers, which, united, form a gulf three hundred miles at least in length, directly across their course.

Stopped more effectually by nature than by any barrier man could devise, they naturally rejected the worthless regions lying to the westward, and turned their course towards the east, occupying the fine valleys of the Colorado Chiquito above its cañon, and following its branches to their source. Having established the kingdom of Cevola, of which Zuñi was the capital, and several other clusters of towns on the neighbouring streams, they commenced to push still further up into the Navajo country, and tried to protect themselves wherever they went against that tribe by building fortified towns. Thus the seven Moqui villages were built, and, still further to the north, another cluster of ruins bears record of yet one more colony. To the north-eastward they passed from the heads of Flax River to the southern branches of the San Juan, where they built many populous towns, as the ruins in the Cañon de Chaco and the Valle de Chelly bear witness, until at last, by following up the head-waters of the Rio de San Juan into the mountains of Colorado, they entered the commencement of the Rio Grande valley, and thus discovered a new and still finer region to colonise and to subdue.

Gradually they worked down the valley from the *north, as their traditions assert*, and very naturally built a large stronghold at Toas, to protect that magnificent valley against the attacks of Utes from the mountains, to which it was exposed. In time the entire valley was peopled and studded with groups of towns from latitude 37° to 32°, a distance of over four hundred miles. So numerous did the Pueblo Indians become in the main valley that they found it unnecessary to live in fortified towns there; but the settlements on the outskirts, such as Pecos, Quarra, or Gran Quivera, where raids from the Buffalo Indians (Arapahoes and Comanches) were to be feared, or Laguna and Acoma, unpleasantly near the homes of the Navajos, were constructed on the same plan as those in the Colorado basin, and were quite as strongly fortified.

Lastly, it is so short and easy a route from the Rio Grande valley about El Paso—which district, according to early Spanish authorities, contained many towns and a great number of people—to the beautiful and fertile valley of the

Rio Corralitos and its lake, the Laguna de Guzman, that I feel convinced the Casas Grandes on this stream were built by a colony from thence, and that the people now occupying it were quite right when they told Mr. Bartlett that the big houses were built by Montezuma's people, who came there *from the north*.

Thus it is that the town-building Indians of New Mexico, not having any record of their former emigration from Old Mexico, have introduced the worship of Montezuma and a state of civilisation quite unknown in North America, and yet affirm in many oft-repeated traditions that they came from *the north*—the head-waters of the Rio Grande.

They are right as far as they go, but they seem to me to have misled every authority I have met with on the subject, some of whom have expended much ingenious argument in trying to prove that they came from the north-western part of the continent (perhaps originally from Kamtschatka), that they crossed a region occupying the upper basin of the Colorado, inhospitable enough to repel any colonists under the sun, and that their town building and Montezuma worship were of indigenous growth, founded by that great emperor himself.

This is certain, viz., that as one community claims the head of the Rio Grande as the birthplace of the great king, another, some district in its own part of the country, and so on, there is no reliance whatever to be placed on any such attempts at local exaltation; but that these people are an offshoot of the race which, under the name of Aztec, overspread Mexico previously to the invasion of the Spaniards, there is, I think, very little doubt.

As late as the end of the sixteenth century all or nearly all the ruins scattered throughout the country, besides many lesser ones now worn away, were inhabited; and the country, according to Spanish accounts, was very fairly populated. At first the Spaniards were received with confidence and kindness: they seem to have been welcomed, by a race striving after civilisation, as superior beings come to help them in their struggle against barbarism. But they soon found that conquest and conversion by force to a new creed were the ruling passions of the intruders, and that they must fight to the last to protect their homes.

From the scraps of information furnished us by Spanish missionaries and commanders we know that the stand these people made for freedom was a long and gallant one. But it was, of course, useless.

The Papagos, who rendered so much assistance to the earliest pioneers, made a most protracted resistance; and, after years of warfare, at last united in a body, invoked their deity, who was supposed to live on the summit of Babuquivari peak, placed all their families, cattle, and worldly goods in a situation of safety, and risked and lost their all in one final battle. Since then they have forsaken their old faith, and remained in peace with the Mexicans.

All the Pueblos were at last subdued, even to the Moquis, far to the northward, who, before the middle of the seventeenth century, had been "wholly converted and reduced" by the zeal of the Franciscans.

Until 1680, the Spaniards appear to have held undisputed sway everywhere; and they adopted their usual course of enslaving the entire population. They colonised the country in considerable numbers, explored the mountains for precious metals, and did a great deal of mining in many places.

If slavery when applied to field labour is destructive to life, what must it be when directed to mining? By means of manual labour alone—that is, by carrying the ore in handbaskets from the "labores," and the water of the deeper workings in buckets, and by grinding the quartz in the rude "arastras," to which men were yoked—large fortunes were made by the conquerors. The ruins of a large prison at the copper-mines in the Miembres Mountains, old mines discovered in greater numbers year by year, which have been carefully stopped up, as well as the traditions of the Indians, all show clearly how the Spaniards used their power.

At last the miserable Pueblos could bear their degradation no longer, and rose throughout the entire country upon their task-masters. Thoroughly detesting the Spaniards, they gave no quarter, and swept them completely from the land. The inhabitants of Santa Fé escaped with their lives down the Rio Grande and founded El Paso, which was the most northern point retained by the whites.

The people of Moqui joined with all their other neighbours in the insurrection, and renounced the Catholic faith. They were never afterwards brought under subjection, nor was the Cross again planted either there or at Zuñi. As regards the other "kingdoms," they were gradually retaken; but not until seven years of hard fighting had thoroughly crushed the inhabitants. We may be tolerably certain that, after massacring their kinsfolk and renouncing Christianity, the Pueblo Indians received no mercy from the Spaniards.

When peace and Christianity were again restored, a more humane policy seems to have been inculcated from the home government and strongly demanded by the clergy on behalf of their poor brethren. As early as the year 1551 we find statutes amongst the laws of Spain laying down, "in the first place, what means are most suitable for the instruction of the Indians in the Holy Catholic Faith," &c.; and in the second place, providing that "the Indians should be brought to settle," and that such lands be chosen for them as are "healthy, ascertaining if there may live in them men of great age, and youths of good condition . . . . whether animals and flocks are healthy and of ample size . . . . fruits and articles of food good . . . . the land suitable for sowing . . . ." (Charles V., 21st March, 1551. Decrees dated June 26th, 1523, and Dec. 1st, 1543.) Also decrees of Philip II., 1638, are to a similar effect. But one dated Madrid, June 4th, 1687, is of especial importance, for it no longer talks of placing the Indians upon reservations; but it extends the system of giving Spanish grants to the Pueblo Indians, and it presents them with those very letters patent which they now hold, and which the United States Government has promised to respect.

The following are a few abridged quotations from it:—

"Whereas, as in my Royal Council of the Indos, the Marquis Folces, Viceroy of New Spain, ordered that each pueblo as might need land to sow, &c. . . . . should be given 5,000* varas, and more if necessary, and that no land should be granted to any one nearer than 1,000 varas, cloth or silk measure, to the houses and lands of the Indians. . . . . And whereas these Indian lands have been encroached upon by owners of estates and lands, thereby depriving the Indians of them, and seizing upon them, sometimes violently, sometimes fraudulently, for which cause the miserable Indians have lost houses and towns, which is what the Spaniards seek for and desire. . . . . I have thought it wise to order and command that there be given and assigned generally to all the Indian pueblos of New Spain for their farming lands *not only* 5,000 varas around the place of settlement, measured from the farthest house in the place north, south, east, and west, and not from the church (generally placed in the centre of the village), but also 1,000 varas more, and shall be authorised to mark off as many more varas of land as shall appear necessary without limitation."

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* 5,000 varas = 1 legua = 2·636 English miles.

The size of these grants differs considerably amongst the pueblos. In eight pueblos each grant covers between 17,000 and 18,000 acres; Isleta contains 110,000 acres; Santa Domingo, 74,000 acres; the smallest is 13,000 acres. Most of them date back to 1689, two years after the passing of the above Act. The date of the patent of Sandia is 1748. Thus, then, we have a distinct acknowledgment by the Spanish government of the necessity for granting special licenses to this industrious and semi-civilised people.

One of the greatest evils, however, which existed under Spanish rule was the almost entire absence of responsibility in officers sent out to govern the remote provinces. However poor the masses became, the men in office must grow rich. It mattered but little how much native labour was consumed, so long as the coffers of the wealthy were rapidly replenished. And thus it happened that the Pueblo Indians gradually decreased; wars and slavery did their worst, until they were unable in many places even to hold their own against the Apaches, who, quick in discovering the weakness of their neighbours, did not hesitate, we may be sure, in trying to complete their ruin.

All the pueblos situated along the Rio Verde, the Salinas, and other northern branches of the Gila were from their position most exposed to attack. The dead tell no tales; but if those ruins could speak, I think they might relate dismal stories of crops yearly destroyed all around them, of cattle run off by thousands, of famished children calling for bread, and of sons and fathers left dead amongst the mountains. The pueblos on Pueblo Creek, those on the streams in the Navajo country, and others similarly situated, shared the same fate; the Indians of Zuñi, the Pimas, and the Papagos were able to protect themselves. The Moquis were saved by the impregnable nature of their country, and the remnant of the kingdoms in the Rio Grande valley were, of course, protected by the Spanish population.

The time at last came when the strong military establishments, so well kept up when Spain was powerful, gradually fell to decay as troops were required to maintain the semblance of power in the southern provinces, and thus the Mexicans, as well as the Pueblos, found themselves unequal to the task of keeping the savages at bay.

No further proof is required of this statement than the following quotation from Miguel Venegas' "History of California," dated 1758. After accurately describing the dimensions of the Apache country, he continues:—"Within a circuit of three hundred leagues the Apaches reside in their small rancheras erected in the valleys and in the breaches of the mountains. They are cruel to those who have the misfortune to fall into their hands; and amongst them are several apostates. They go entirely naked, but make their incursions on horses of great swiftness, which they have stolen from other parts. A skin serves them as a saddle. Of the same skins they make little boots or shoes of one piece (moccasins), and by these they are traced in their flight. They begin the attack with shouts at a great distance, to strike the enemy with terror. They have not naturally any great share of courage; but the little they can boast of is extravagantly increased on any good success. In war they rather depend upon artifice than valour; and on any defeat submit to the most ignominious terms, but keep their treaties no longer than suits their convenience. His Majesty has ordered that if any require peace, it should be granted, and even offered to them before they are attacked. But this generosity they construe to proceed from fear. Their arms are the common bows and arrows of the country. The intention of their incursions is plunder, especially horses, which they use both for riding and eating, the flesh of these creatures being one of their greatest dainties.

"These people, during the last eighty years past, have been the dread of Sonora, no part of which was secure from their violence. . . . Of late years, the insolence of these savages has been carried to the most audacious height from the success of some of their stratagems, particularly owing to the variances and indolence of the Spaniards. . . . The Apaches penetrate into the province by different passes, and, after loading themselves with booty, will travel in one night fifteen, eighteen, or twenty leagues. To pursue them over mountains is equally dangerous and difficult, and in the levels they follow no paths. On any entrance into their country, they give notice to one another by smokes or fires; and at a signal they all hide themselves. The damages they have done in the villages, settlements, farms, roads, pastures, woods, and mines are beyond description; and many of the latter, though very rich, have been forsaken."

No better description than this could be given of the Apaches at the present time.

With respect to Casas Grandes, in Chihuahua, these pueblos, when built, were evidently liable to the incursions of the Apaches, otherwise they would not have been constructed as fortified towns. But rich mines were early discovered in the mountains hard by, and extensively worked by the

Spaniards ; so that it is impossible to say whether slavery or the Apaches, or both, caused the destruction of the entire population.

It only remains, in concluding this account of the Pueblo Indians and their history, to say a few words on a subject usually brought forward as chief amongst the causes which have led to the extinction of that race.

I have heard it affirmed on all sides that the country has become depopulated because it is no longer capable of sustaining its former inhabitants, and that as the face of nature changed, so did those dependent upon nature diminish. The country *has* changed for the worse. A few centuries ago, the rain-fall was greater ; forests were more abundant ; spots were productive which now are barren ; and springs gushed from the ground which now are dry. But at this period, also, a much larger area of land was probably under cultivation—both with and without irrigation—than to-day ; and I think it far more likely that the decrease in the amount of land cultivated tended to produce aridity than that the change of climate made the country uninhabitable. The Spaniards probably did great mischief by stripping the hills of timber for mining purposes, and thus drying up springs, the waters of which were so needed in the valleys. The greater part of the Rio Grande was swept of its timber, and is very different now from what it was when Antonio de Espejo visited it in 1582.* The Apaches also have a very destructive habit amongst their long catalogue of vices of firing the forests of their enemies. Although these facts may account for the gradual drying up of the country, they will not explain how it happens that the fertile bottom-lands along the Rio Verde—a country, according to Leroux, "well timbered, and containing many lagoons"—are now uninhabited; while the people of Moqui, who live almost in a desert, have managed to fight out the battle of existence down to the present day.

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* The engraving of the Rio Grande, in chap. i., vol. ii., represents it as well timbered ; this view, however, was taken in a district quite uninhabited, and one, moreover, which has remained so for a very long period.

Colonel Greenwood, who had charge of one of our engineering parties, discovered two very remarkable objects near the San Francisco Mountains. One was a broken jar, into the hollow of which lava had flowed. The other was the skeleton of a man, encased in the same material. If the colonel was not deceived, it is certain that some of the lava which now covers large tracts of country in many parts of New Mexico, and especially Arizona, and still looks bright and fresh, was poured over the surface within the present epoch, but it cannot prove that either the convulsions of the earth or climatic changes produced by them so altered the condition of the land that it starved out its inhabitants. The natural workings of cause and effect are, I think, sufficient to account for the present desolation of these regions, without calling to our aid either meteorology or geology.

END OF VOL. I.

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