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by George Wharton James

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The Grand Canyon Of Arizona: How To See It

By

George Wharton James

Author of "In and Out of the Old Missions," "The Wonders of the Colorado Desert," "Through Ramona's Country," etc.

Revised Edition

Boston: Little, Brown, and Company

Kansas City: Fred Harvey

1912

PREFACE TO REVISED EDITION

Because of the completion of a new driveway along the Rim of the Grand Canyon, and of a new trail to the Colorado River, a second edition of this book is deemed necessary.

These improvements, which have recently been made by the Santa Fe Railway, are known as Hermit Rim Road and Hermit Trail. The first, said to be the most unique road in the world, is nine miles long on the brink of the Canyon, and the other, a wide and safe pathway down the south wall.

The contents of the volume has been revised, and descriptions of Hermit Rim Road and Hermit Trail have been added. There are also new portions describing the drives and trips that may be taken through the forest on the Rim and in the Canyon itself, each carefully planned so that the traveler may devote to sightseeing whatever amount of time he desires.

With these additions and alterations, the original plan to provide a convenient handbook for all travelers to the Grand Canyon is more complete.

FOREWORD

Upwards of ten years ago I sat on the south rim of the Grand Canyon and wrote "In and Around the Grand Canyon." In that book I included much that more than a decade of wandering up and down the trails of this great abyss had taught me. At that time the only accommodations for sightseers were stage lines or private conveyance from Flagstaff and Ash Fork, and, on arrival at the Canyon, the crude hotel-camps at Hance's, Grand View, Bright Angel, and Bass's. The railway north from Williams was being built. Everything was crude and primitive.

Now the railway is completed and has become an integral part of the great Santa Fe System, with at least two trains a day each way carrying Pullman sleepers, chair cars and coaches. At Bright Angel, where the railway deposits its passengers at the rim of the Canyon, stands El Tovar Hotel, erected by the railway company at a cost of over a quarter of a million dollars, which is equipped and conducted by Fred Harvey. Yet El Tovar is more like a country club than a hotel, in many respects, and, to that

extent, is better.

Hence while nothing in the canyon itself has changed, and while my book, "In and Around the Grand Canyon," is still as helpful to the traveler and general reader as ever, there has been a growing demand for a new book which should give the information needed by the traveler who comes under the new conditions, telling him how he may best avail himself of them. This book is written to meet this demand. It therefore partakes more of the character of a guide book than the former volume, so it has been decided to make it lighter in weight and handier in form, so that it can be slipped into the pocket or handbag, and thus used on the spot by those who wish a ready reference handbook.

Used in connection with the earlier volume or alone for it is complete in itself in all its details—it cannot fail to give a clearer and fuller comprehension of this "Waterway of the Gods,"—the most incomparable piece of rugged scenery in the known world.

George Wharton James
El Tovar, Grand Canyon,
September, 1909.

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CHAPTER I. The Grand Canyon Of Arizona

Only One Grand Canyon. The ancient world had its seven wonders, but they were all the work of man. The modern world of the United States has easily its seven wonders—Niagara, the Yellowstone, Yosemite, the Natural Bridge, the Mammoth Cave, the Petrified Forest and the Grand Canyon of Arizona—but they are all the work of God. It is hard, in studying the seven wonders of the ancients, to decide which is the most wonderful, but now that the Canyon is known all men unite in affirming that the greatest of all wonders, ancient or modern, is the Grand Canyon of Arizona. Some men say there are several Grand Canyons, but to the one who knows there is but one Grand Canyon. The use of the word to name any lesser gorge is a sacrilege as well as a misnomer.

Not in the spirit of carping criticism or of reckless boasting are these words uttered. It is the dictum of sober truth. It is wrong to even unintentionally mislead a whole people by the misuse of names. Until made fully aware of the facts, the traveling world are liable to error. They want to see the Grand Canyon. They are shown these inferior gorges, each called the Grand Canyon, and, because they do not know, they accept the half-truth. The other canyons they see are great enough in themselves to claim their closest study, and worthy to have distinctive names bestowed upon them. But, as Clarence Dutton, the eminent geologist, has well said in his important scientific monograph written for the United States Geological Survey: "The name Grand Canyon repeatedly has been infringed for purposes of advertisement. The Canyon of the Yellowstone has been called 'The Grand Canyon.' A more flagrant piracy is the naming of the gorge of the Arkansas River 'The Grand Canyon of Colorado,' and many persons who have visited it have been persuaded that they have seen the great chasm. These river valleys are certainly very pleasing and picturesque, but there is no more comparison between them and the mighty chasm of the Colorado River than there is between the Alleghanies and the Himalayas.

Sublimity of the Grand Canyon. "Those who have long and carefully studied the Grand Canyon of the Colorado do not hesitate for a moment to pronounce it by far the most sublime of all earthly spectacles. If its sublimity consisted only in its dimensions, it could be set forth in a single sentence. It is more than two hundred miles long, from five to twelve miles wide, and from five thousand to six thousand feet deep. There are in the world valleys which are longer and a few which are deeper. There are valleys flanked by summits loftier than the palisades of the Kaibab. Still the Grand Canyon is the sublimest thing on earth. It is so not alone by virtue of its magnitudes, but by virtue of the whole its tout ensemble."

What, then, is this Grand Canyon, for which its friends dare to make so large and bold a claim?

It is a portion—a very small portion—of the waterway of the Colorado River, and it is so named to differentiate it from the other canyons of the same river. The canyon system of the Colorado River is as vast in its extent as is the Grand Canyon in its quality of sublimity. For it consists of such a maze of canyons—the main canyons through which the river itself runs; the canyons through which its tributaries run; the numberless canyons tributary to the tributary canyons; the canyons within canyons, that, upon the word of no less an authority than Major Powell, I assert that if these canyons were placed end for end in a straight line they would reach over twenty thousand miles! Is it possible for the human mind to conceive a canyon system so vast that, if it were so placed, it would nearly belt the habitable globe?

Impression on Beholders. And the principal member of this great system has been named The Grand Canyon, as a conscious and meaningful tribute to its vastness, its sublimity, its grandeur and its awesomeness. It is unique; it stands alone. Though only two hundred and seventeen miles long, it expresses within that distance more than any one human mind yet has been able to comprehend or

interpret to the world. Famous word-masters have attempted it, great canvas and colormasters have tried it, but all alike have failed. It is one of the few things that man is utterly unable to imagine until he comes in actual contact with it. A strange being, a strange flower, an unknown reptile, a unique machine, or a strange and unknown anything, almost, within the ken of man, can be explained to another so that he will reasonably comprehend it; but not so with the Grand Canyon. I had an illustration of this but a few days ago. A member of my own household, keenly intelligent and well-read, who had heard my own descriptions a thousand and one times, and had seen photographs and paintings, without number, of the Canyon, came with me on her first visit to the camp where I am now writing. As the carriage approached the rim at Hotouta Amphitheatre and gave her the first glimpse of the Canyon, she drew back terrified, appalled, horror-stricken. Subsequent analysis of her emotions and the results of that first glimpse revealed a state of mind so overpowered with the sublimity, vastness, depth and power of the scene, that her impressions were totally inadequate, altogether lacking in detail and accuracy, and at complete variance with her habitual observations.

Whence came so utter a confusion of the senses? The Canyon is its own answer. It fills the soul of all responsive persons with awe. Explain it as one will, deny it if one will, sensitive souls are filled with awe at its superb majesty, its splendor, its incomprehensible sublimity. And in these factors we find the great source of its attractiveness, for, in spite of the awe and terror it inspires in the hearts of so many at first sight, it allures, attracts and holds those who have once gazed into its mysterious depths. Indeed, is it not to its very vastness, mystery, solitude and awe-inspiring qualities we owe its power over us? The human mind is so constituted that such qualities generally appeal to it. Hence the never-ceasing call the Canyon will make to the soul of man, so long as a susceptible mortal remains on earth.

Its Physical Features. Seen at any time it is bewildering and appalling to one's untrained senses; but especially in the very early morning, during the hours of dawn and the slow ascent of the sun, and equally in the very late afternoon and at sunset, are its most entrancing effects to be witnessed. At midday, with the sun glaring through into its depths, the reds and chocolates of the sandstones (which are the predominating colors) are so strong, and the relieving shadows so few, that it seems uninteresting. But let one watch it as I did last night, between the hours of seven and ten, and again this morning from five until eight of the clock. What revelations of forms, what richness of colors; what transformations of apparently featureless walls into angles and arches and recesses and facets and entablatures and friezes and facades. What lighting up of towers and temples and buttes and minarets and pinnacles and ridges and peaks and pillars of erosion! What exposures of detached and isolated mountains of rock, of accompanying gorges and ravines, deep, forbidding, black and unknown, the depths of which the foot of man has never trod! Turner never depicted such dazzling scenes, Rembrandt such violent and yet attractive contrasts. Here everything is massive and dominating. The colors are vivid; the shadows are purple to blackness; the heights are towering; the depths are appalling; the sheer walls are as if poised in mid-air; the towers and temples dwarf into insignificance even the monster works of man on the Nile. Here are single mountains of erosion standing as simple features of the vast sight spread out for miles before you, that are as high as the highest mountains of the Eastern States. A score of Mt. Washingtons find repose in the depths of this incomprehensible waterway, in the two hundred and seventeen miles of its length. In width it varies from ten to twenty miles, and at the point where I now sit writing, where the Canyon makes a double bow-knot in a marvelous bend, the north wall (which, in the sharp bend of the river, becomes the south wall of the reverse of the curve) is completely broken down, so that one has a clear and direct view across two widths of canyon and river to a distance of from thirty-five to forty miles. Who can really "take in" such a view? I have gazed upon the Canyon at this spot almost yearly, and often daily for weeks at a time, for about twenty years, yet such is the marvelousness of distance, that never until two days ago did I discover that a giant detached mountain, fully eight thousand feet high, and with a base ten miles square, which I had photographed from another angle on the north side of the Canyon, stood in the direct line of my sight and, as it were, immediately before me. The discovery was made by a peculiar falling of light and shadow. The heavens were filled with clouds which threw complete shadows on the far north wall. The sun happened to shine through the clouds and light up the whole contour of this Steamboat Mountain (so called because of its shape), so that it stood forth clearly outlined against the dark field behind. In surprise I called to my companion and showed her my discovery. Yet, such is the deceptiveness of distance that, to the unaided eye, and without being aware of the fact, even my observant faculties had never before perceived that this gigantic mass was not a portion of the great north wall, from which it is detached by a canyon fully eight miles wide.

No one can know the Grand Canyon, in all its phases. It is one of those sights that words cannot exaggerate. What does it matter how deep you say—in hundreds or thousands of feet—the Canyon is, when you cannot see to the bottom of it? Strict literalists may stick out for the exact figures in feet and inches from rim to river—elsewhere given as the scientists of the United States Geological Survey have recorded them—but to me they are almost valueless. Its depth is beyond human comprehension in figures, and so is its width. And the eye of the best trained man in the world cannot grasp all its

features of wall and butte and canyon, of winding ridge and curving ravine, of fell precipice and rocky gorge, in a week, a month, a year, or a lifetime. Hence words can but suggest; nothing can describe the indescribable; nothing can picture what no man ever has seen in its completeness.

What Men Have Said of the Canyon. Men have stood before it and called it "an inferno, swathed in soft celestial fires;" but what is an inferno? And who ever saw the fires of heaven? Words! words! words! Charles Dudley Warner, versed in much and diverse world-scenery, mountain-sculpture, canyon-carvings, and plain-sweep, confessed: "I experienced for a moment an indescribable terror of nature, a confusion of mind, a fear to be alone in such a presence. With all its grotesqueness and majesty of form and radiance of color, creation seemed in a whirl." When the reader thinks of grotesqueness, what images come to his mind? A Chinese joss, perhaps; a funny human face on the profile of a rock, but nothing so vast, so awful, so large as this. The word "majesty" suggests a kingly presence, a large man of dignified mien, or a sequoia standing supreme over all other trees in the forest. But a thousand men of majesty could be placed unseen in one tiny rift in this gorge, and all the sequoias of the world could be planted in one stretch of this Canyon, and never be noticed by the most careful watcher on the rim.

Another, reaching the Canyon at night, declared that she and her companions seemed to be "standing in midair, while below, the dark depths were lost in blackness and mystery." Again mere words! words! For whoever stood in mid-air?

Still another calls it "the most ineffable thing that exists within the range of man," and later explains when he stands on the brink of it; "And where the Grand Canyon begins, words stop." Yet he goes on and uses about four more pages of words, and pictures after words have stopped, to tell what he felt and saw. And the remarkable thing is that his experience is that of all the wisest men who have ever seen it. They know they cannot describe it, but they proceed to exhaust their vocabularies in talking about it, and in trying to make clear to others what they saw and felt. And in this very fact what a wonderful tribute lies to the power of the Canyon; that a wise and prudent man is led to strive to do what he vows he will not do, and knows he cannot do.

One well-known poet exclaims: "It was like sudden death." yet she is still alive. Again, after breakfast, she wrote: "My courage rose to meet the greatness of the world." Then she "crawled half prostrate" to the barest and highest rocks she could find on the rim, and confessed: "It made a coward of me; I shrank and shut my eyes, and felt crushed and beaten under the intolerable burden of the flesh. For humanity intrudes here; in these warm and glowing purple spaces disembodied spirits must range and soar, souls purged and purified and infinitely daring." Yet here I have heard the wild brayings of hungry mules and the worse ravings of angry men—none of them impressed as was the soul of the poet.

One money-making business man declared that he went to the rim at night-time, and when he and his friends reached the spot they put forth their hands and found—"an absolute end. We clutched vainly at black space. To fathom this space we thrust over a big stone. No sound came back. The pit was bottomless—the grave of the world. The mystery fascinated, the void beckoned. We scarcely knew why we did not obey the summons—why we did not abandon the present, and, by following the big stone, escape to the future." And yet he had no urgent creditors bothering him. His financial position was secure and unquestioned. His family relations were all that could be desired. Wonderful, indeed, that a mere feature of natural scenery could have led him to wonder why he didn't leave all the luxuries and certainties of life, and leap into the unknown future! Yet that is just the way the Canyon affected a sober business man of steady judgment.

A well-known writer declares: "It is a paradox of chaos and repose, of gloom and radiance, of immeasurable desolation and enthralling beauty. It is a despair and a joy; a woe and an ecstasy; a requiem and a hallelujah; a world-ruin and a world-glory—everything in antithesis of such titanic sort." I agree with him, and regard his expressions as indicative of my own sensations.

Yet, when a reverend gentleman calls it a "delirium of nature," I cannot agree with him. The delirium might be in his own mind, but there is no delirium here. Neither does it seem to me that a certain university president expresses things with any more wisdom or effectiveness, when he says that it "impressed him with its infinite laziness." Lazy? When once, in the far-distant past, after rising from the primeval sea, it sank back again and deposited twelve thousand feet of strata, then lifted them out into the sunshine, carved eleven thousand feet of them away, and sent them dashing down the river to fill up the Gulf of California and make the Mohave and Colorado Deserts? Lazy? When, after that was done, it sank again, and allowed a thousand feet of Cambrian to be deposited; then two thousand feet of Carboniferous; then Permian, Triassic, Jurassic and Cretaceous, until the three thousand feet were increased to two miles of deposits. Then it began to lift itself up again. Lazy? When lifting up two miles' thickness of strata for the clouds and their children to carve away? And it lifted and lifted, until it destroyed a vast Eocene lake, which covered as large an area as perhaps half a dozen Eastern States,

and at the same time carried away about twelve thousand feet of strata. Lazy? When you consider that from north to south, for a hundred or more miles, the whole region has been heaving and tossing, curving and buckling, arching and crumpling its strata, faulting by rising, faulting by sinking, until the geologist who would study the faults finds, in the area of one half-mile, near the mouth of Shinumo Creek, his work for a lifetime cut out for him.

No! No! Mr. College President! You must look more fully. You must guess again! The Canyon is not lazy. It is merely a gigantic natural representation of yourself. You are the embodiment of energy of body, mind and soul; yet you are never seen hurried or disturbed. You have the serenity of genius. So with the Canyon. It has done and is doing great things. It has been a persistent worker during the millions of years of its existence, but it has the calm serenity of consciousness of strength. What you took to be laziness is the restfulness of divine power.

When First Seen. These are some of the effects the Canyon has upon men. I once walked up to the rim with a lawyer, who to-day is one of the foremost figures of the San Francisco bar, a man of lion-like courage and almost reckless bravery. At the first glimpse he fell on his knees, clasped me around mine, and begged me to take him away, declaring that a gift of all Arizona would not lead him to take another glimpse into its awesome depths.

I know of one lady who, for weeks afterwards, would wake up almost every night, and feel herself falling into the fathomless gorge.

Yet the next day the lawyer went with me down to the river, and to this day declares it was the "most memorable trip of his life;" while the timid lady, to my own knowledge, has made over five trips to the Canyon.

Those of less susceptible nerves cannot conceive the effect the first sight of the Canyon produces upon such supersensitive natures as these to which I have referred. I have seen strong men fall upon their knees. I have seen women, driven up to the rim unexpectedly, lean away from the Canyon, the whole countenance an index of the terror felt within, gasp for breath, and though almost paralyzed by their dread of the indescribable abyss, refuse either to close their eyes or turn them away from it. Some few remain away for a day or two until their nerves become more steady. Yet I have never known one of these susceptible observers, these keenly sensitive natures that, on due consideration, has not been thankful for the experience, and in every case has either returned to fully enjoy the Canyon, or has longed to do so.

But, you ask, what is the Canyon for? The answer is simple, and reveals a very humble task as the main work of this vast and gorgeously-colored abyss. It merely acts as the home of a great river, that for hundreds of miles does not serve a single useful purpose to man.

Yet purely material uses are of the lowest kind. The Grand Canyon has a far higher mission than that I have spoken of, and others that are suggested in various chapters of this book. The Grand Canyon is God's greatest gift of His material handiwork in visible form on our earth. It is an expression of His divine thought; it is a manifestation of His divine love. It is a link, a wonderful connecting link, between the human and the Divine, between man and his Great Creator, his Loving Father, Almighty God.

CHAPTER II. On The Grand Canyon Railway To El Tovar

History of the Grand Canyon Railway. The Grand Canyon Railway leaves the main line of the Santa Fe at Williams, Arizona. It is an integral part of the Atchison, Topeka and Santa Fe Railway System, that operates its own lines between Chicago, Los Angeles and San Francisco.

Though surveys had been made years ago from Ash Fork, Williams and Flagstaff, it was left for the Tusayan Development Company of New York, who owned a group of copper mines located twenty miles south of the head of Bright Angel Trail, actually to build the railway part way to the Canyon. It was later extended to the rim by the Santa Fe, and afterwards practically rebuilt. The original purpose was to reach the mines referred to and convey the ore to Williams, where the smelter then erected is to be seen on the hillside east of the town.

The promoter of the mines and railway was "Bucky" O'Neill, a prominent Arizona citizen, at one time mayor of Prescott, who became world-famous by his tragic death during the charge of the Rough Riders at San Juan Hill.

The First Four Miles. Striking due north, the railway passes over masses of malapais, or lava float, until, four miles out, it crosses Havasu (Cataract) Creek. If the rains are just over, the rough rocks will be entirely covered and hidden by a gorgeous growth of sunflowers and lupines, the yellows and

purples making a carpet that, in the brilliant sunlight, fairly dazzles the eye. Here and there a band of sheep may be seen, with straggling herds of cattle and horses. In the winter time it is not unusual to find snow covering the plateau, for it must not be forgotten that it has an elevation of nearly seven thousand feet. During the early summer, before the rains, it is often barren and desolate.

Yet at all seasons the slopes of Williams Mountain are charming and beautiful. The tender and vivid tones of the evergreen trees that cover it render it a restful and attractive feature of the landscape.

Havasu Creek. Havasu Creek flows above ground for several miles, then disappears to make a subterranean stream, which finally emerges in wonderful volume, in a thousand springs, in the heart of Havasu Canyon, just above the village of the Indians of the same name. Crossing it, four miles from Williams, the railway enters a belt of cedars and junipers, passes Red Lake,—a volcanic sink-hole, which, at rare intervals, is filled with water.

Deer and Antelope. For a dozen miles the road passes through a series of charming parks, where deer and antelope are sometimes seen. While driving his train through one of these parks, early in December, 1907, S. O. Miller, one of the engineers of the Grand Canyon Railway, saw a majestic black-tailed deer running a little ahead of his engine. Suddenly the beautiful creature turned, tried to cross the track, and was instantly killed. Stopping the train, Miller got help, and it took four men to lift the dead animal and place it on the engine. The skin and head were mounted. The animal is so perfect and royal a specimen that the owner says a thousand dollars could not purchase it from him.

Miller rather enjoys the distinction of being the only known deer hunter of the West who has chased his game and killed it with a locomotive.

Surrounding Mountains. One should not fail to look back, as the train journeys along, for fine, full views of the Volcanic Mountains,—the San Franciscos, Kendricks, Sitgreaves and Williams. The two former are sharp, pyramidal-shaped masses, towering from nine thousand to twelve thousand feet into the blue, while the two latter are well wooded and rounded, though volcanic,—Williams Mountain having seven distinct crests at different altitudes.

When about ten miles out, Mount Floyd, another volcanic pile, rises above the plain on the west. Two sharp peaks come in sight, and later, long ridges of deep blue stretch away to the north. These are the Blue Ridge, and are formed of lava which has flowed from Mount Floyd.

Ant-Hills. To many it is a novel sight to see the ant-hills that dot the plain all the way along. These tiny creatures build their homes underground, carrying out all the small pieces of rock that are in their way. By and by they build up quite a mound of these stones, and, it is on these that the Navaho Indians often find the garnets, rubies and peridots they offer for sale. Around the mounds the ground is stripped bare by the busy ants, who remove every particle of vegetation in a radius of two or three feet.

Desert Rains. If it is early summer when you ride over this region, do not be deceived by the barrenness of the thirsty country (as you leave the cedars), and the dry, cloudless sky, and imagine that it never rains. I have been here in the midst of such rain storms as I have rarely experienced elsewhere. When the showers do fall, they often come with a fullness that is as distressing as is the want of water during the dry season.

Red Butte. Twenty-nine miles out, near the station of Valle, is the big bridge, some fifty feet high and three hundred feet long, over a branch of the Spring Valley Wash; and here Red Butte becomes a prominent landmark on the right. This is known to the Havasupai Indians as Hue-ga-da-wi-za, the Mountain of the Clenched Fist, for this is its appearance when seen at certain angles. It is a remnant of the Permian sandstone that once covered the whole Grand Canyon region, and its brilliant red, when illuminated by the vivid Arizona sun, explains why for so many years it has been a prominent landmark of the plateau. It stands boldly forth on the eastern edge of what was undoubtedly once a portion of the vast Eocene lake, the drainage way of which helped to cut down the Canyon we are so soon to see.

Interesting stories might be told of Red Butte and its region. The Havasupais have a tradition that many years ago a large spring of water flowed from near its base, but in the great convulsion of nature which changed the current of the waters of Havasu Creek the spring disappeared, and never has been seen since. The presence of a number of quaking aspens in the region, however, denotes that water is still there. It also has been claimed that documents on file in Tucson prove that silver mining was extensively carried on here as early as the year 1650.

Prehistoric Lake. At the twenty-eighth mile post, we have left the cedars behind, and until we strike Anita junction only a few scraggly, solitary trees are to be seen. We are on the edge of the great prehistoric lake. The country is seamed with small, rocky gorges, which we cross. They are sometimes lined with scrub-brush, and made beautiful by many colored flowers. All these "draws" are tributary to

Havasu (Cataract) Creek, but it is interesting to remember that most of them convey the drainage water away from the rim of the Grand Canyon until, by the subterranean channel before referred to, the stream is taken back to the Havasu Canyon and soon, deep, deep, deep down, some five thousand feet below the rim, is ejected into the muddy Colorado River.

The First Sight of the Canyon. A glance out of the right window will now show one a portion of the north wall of the Canyon. It is a fairly level stretch of wall running east and west, though there is a break in it, and then an uprising curve, as if the crust here had received a lateral thrust strong enough to break and then "buckle" it up from east to west.

Crossing the Red Horse Wash, known to the Havasupais as Ha-i-ga-sa-jul-ga, the line reaches Anita Junction. Here a spur three miles long connects the main line with the copper mines of the Anita Consolidated Company, for which the railway originally was built. The grade of the spur was so engineered that the loaded cars of ore from the mine (when in operation) are brought down by gravity.

Coconino Forest. A few miles further on, the railway enters a country of pine and juniper, a stately prelude to the majesties and grandeurs of the Kohonino (Coconino) Forest. Here it seems as if one were suddenly transported to England, and were passing through a succession of landed estates, without, however, finding the accompanying mansions. Aisles of stately trees, nature planted and grown, yet as perfectly in line as if set with mathematical precision, lead the eye into open glades where deer and antelope move to and fro, and where one looks instinctively for the bold facade of an historic building, or the battlemented towers of some romantic castle.

Arrival at El Tovar. Now, bearing off in a westerly direction, the railway leaves the Kohonino Wash, and soon crosses a divide beyond which, to the left, may be seen the house at Bass. This is a flag-station for Bass Camp. A mile or so further, and a wash opens to the left. This leads to Rowe's Well (Ha-ha-wai-i-the-qual-ga), where the chief ranger of the Forest Reserve has his home. Another four miles of steady upgrade, and the whistle of the engine denotes that Grand Canyon is reached. Here, in addition to El Tovar, Bright Angel Camp, the powerhouse, and the buildings of the transportation department, are a postoffice, photograph gallery and several buildings for employees of the railroad, rangers, etc., so that there is quite a little settlement.

The main attractions, however, are the Canyon and El Tovar, the hotel itself being so unique and picturesque as to require a separate chapter for its description.

CHAPTER III. El Tovar And Its Equipments

Location of El Tovar. The West has several unique and picturesque hotels, but I question whether it possesses one more so than that bearing the name of the gallant Spanish cavalier, Coronado's lieutenant, the Ensign Tovar. Built upon the very edge of the Canyon, in latitude 35 degrees 55 minutes 30 seconds, it is the arc of a rude curve of an amphitheatre, the walls of which are slightly higher than the elevation of the hotel. Its location affords the most intimate views of the great gorge, attracting spectators from all over the civilized world. Indeed, were it not for these visitors, El Tovar would never have been built. Its existence came out of a crying necessity. It was built by the Santa Fe Railway, and furnished and equipped by Fred Harvey, whose hotel and dining service for over a quarter of a century has made the Santa Fe noted as giving the best food service of any railway system in the world.

The Building. And what of the building itself? Stand away a little distance —say half a mile or more, for it is large enough to be seen and well described that far away—and it presents the appearance of a three-storied bungalow, though later you find that in some points it is four stories high. Its base is of solid, native limestone rock, well built up and continued in the massive outside chimneys, one of which stands at each end of the dining-room. The first story is of solid logs, brought from faraway Oregon, and the upper stories are of heavy planking and shingles, all stained to a rich brown or weather-beaten color; that harmonizes perfectly with the gray-green of its unique surroundings. It is pleasant to the eye, artistic in effect, and satisfactory to the most exacting critic. Its width, north and south, is three hundred and twenty-seven feet, and from east to west, two hundred and eighteen feet. The main building and entrance face the east.

Architecture. Its lines are in harmony with the simplicity of the surroundings. The architect has followed, in admirable proportions, the Swiss chalet and the Norway villa. Here are expressed a quiet dignity, an unassuming luxury, and an appreciation of outing needs. Not a Waldorf-Astoria—admirable as that type is for the city but a big, country clubhouse, where the traveler seeking high-class accommodations also finds freedom from ultrafashionable restrictions. You may wear a dress suit at dinner or not. You may mix with the jolly crowd, or sit alone in a quiet nook. You may lunch at almost any hour of the day or night. You may dine with other guests, or enjoy the seclusion of a private dining-

room. Good fellowship perhaps best expresses the motto of El Tovar.

The hotel contains more than a hundred bedrooms. Ample accommodations are provided for two hundred and fifty guests, and more can be comfortably housed in the annex, at Bright Angel Camp. Outside are porches and roof gardens, from which one has wide views in every direction. The inside finish is mainly of peeled slabs, wood in the rough, and tinted plaster, interspersed with huge wooden beams. Triple casement windows and generous fireplaces abound. Indian curios and trophies of the chase are used in the decorations. The furniture is of special pattern.

El Tovar is more than a hotel; it is a village devoted to the entertainment of travelers. Far from the accustomed home of luxury, money has here summoned the beneficent genii who minister to our bodily comfort. Merely that you may have pure water to drink, it is brought from a mountain spring ninety miles away! And that is only one of the many provisions for unquestioned excellence of shelter and food. The hotel is conducted on the American plan. The rates are four dollars a day and upwards.

The Rendezvous. Leaving the train at the station, a short distance from the hotel, you proceed up a winding road to the main entrance, a hasty glimpse through low cedars revealing the far canyon wall.

Above the wide steps, and in front of the Norway gable, hospitably swings the Tovar coat-of-arms. On the broad porch are numerous rocking-chairs and small tables, with a push-button handy for ordering light refreshments. The porch corners are of solid rough masonry, built in old mission style, the arches wide and low. The first impression is one of good cheer. Once inside, the traveler will willingly linger a few moments in the Rendezvous or Nimrod's Cabin. This is a large room, forty-one by thirty-seven feet, notable for uneven walls of dark stained fogs and bulky rafters. In a huge corner fireplace, pine knots burn cheerily when the air is chilly. Electric lights are placed in log squares, swinging from the low roof at the end of long chains. Gray Navaho rugs cover the brown floor. There are cosy tete-a-tetes and easy chairs. On an upper shelf repose heads of the deer, elk, moose, mountain sheep, and buffalo, mingling with curiously shaped and gaudily tinted Indian jars from the southwest pueblos. An old-fashioned clock ticks off the hours. Several small escritoires remind you of letters to be written to the home people. Recessed window-seats, partly hidden by red curtains, complete the picture.

What wonder that every morning and evening most of the guests gather in this room—the ladies to read and gossip; the gentlemen to smoke and tell of their latest adventures. Few country clubs have as pleasant a meeting place; yet it is only one of El Tovar's many allurements.

The Office and Ladies' Lounging Room. Cross the western edge of the Rendezvous, and you are in the rotunda, the centre of the hotel's many activities and its very necessary hub. Whether bound for dining-room or parlors, for guest chamber or amusement room; whether attracted by the click of billiards below, or the brightness of the roof-garden above,—all paths here intersect.

On the first floor is the office. A story above, reached by an easily ascended stairway, is the ladies' lounging room, nestled around an octagonal open space that extends from the office to the roof.

Just beyond are the art rooms, containing paintings and photographs of the Canyon; on the walls hang paintings of southwest scenery from the brushes of noted American artists, including some of Thomas Moran's masterpieces. Yellow hangings and electric lights brighten the dark tones of the woodwork.

The Sleeping-Rooms. There are more than a hundred of them. They are found on all four floors. The Arizona sunshine generously enters each one at some hour of the day. Steam heat (automatically regulated), electric lights and office telephones are provided—willing servants quickly to do your bidding.

On the first and second floors are forty-two rooms en suite. There are twenty-one commodious bathrooms, white as snow and kept spotlessly clean.

On the office and first floors are two private parlors en suite. The furniture is mostly of arts and crafts design.

Dining-Room. When travel stains are removed, you are directed to the dining-room. It is quadrangular in form, ninety feet long by forty feet wide, arched overhead, the roof supported by six huge log trusses. Walls and trusses and roof are all finished in rough wood, and are as brown as a coffee berry. The two fireplaces are built of gray sandstone.

A dozen electroliers of rustic pattern hang from the ceiling. Electric wall lights and candelabra for the side tables complete the lighting.

Through any of the many triple windows may be seen the large-eyed stars; for here the sky seems to

bend closer to earth than in lower altitudes.

The tables are adorned with glass, silver and flowers. You also notice old brass dishes, antique Dutch and English platters, and Indian ollas, displayed on the plate rail.

Well-trained waitresses, in white uniforms, deftly serve the meal, which is Harvey's best. While you are leisurely dining, it is pleasant to look around and see who your neighbors are. They have come here from every section—perhaps a New York or Chicago banker, a Harvard professor, an Arizona ranchman, an English globe-trotter, and a German savant. Pretty women and lovely children complete the picture.

The dinner itself is prepared under the direction of a capable Italian chef, once employed in New York and Chicago clubs. He presides over one of the most complete and up-to-the-minute hotel kitchens in the United States.

On the right of the main entrance is a small breakfast room, tastefully decorated in fifteenth century style. On the left is a private dining-room, whose wall decorations mainly consist of Indian deer hieroglyphics, reproduced from old pictographs in Mallery Grotto.

The Music-Room and Solarium. At the end of the north wing, on the office floor, fronting the Canyon's abyss, is a spacious room devoted to refined amusements. The wall decorations are of gold, trimmed in old ivory, imitating fifteenth century leather. Sunshine streams in from numerous windows. The music-room is so admirably located and so daintily furnished, that it is a favorite resort for lovers of music, cards, and dancing.

Where the south wing terminates, and on the office floor, is a sunny, glass-enclosed nook, open on three sides and sheltered from cool north winds. It is called the solarium or sun-parlor. To this retreat come the ladies, with sewing baskets and books. It is quite the fad to take a sunbath here.

On the top floor, and out of doors, are two roof gardens, where light refreshments are served.

The Amusement Room and Clubroom. On the ground floor, easily reached from the office and from the rim pathway, is the amusement room, fitted with billiard, pool, and card tables, and shuffle-boards. Adjacent is the clubroom.

Water Supply. For fire purposes, there is a Knowles high-duty underwriter's fire pump, which is regularly used for the transportation of water to the high steel water-tank, capable of holding three hundred and twenty thousand gallons. Pure spring water is hauled in tank cars from Bellemont, ninety miles away, about seven cars a day being required for all purposes. Every drop of water, before entering the hotel, passes through two quartz filters, and drinking water is distilled twice and then aerated.

Sewerage. The sewerage system of a large hotel is a matter of primary importance. At El Tovar the matter was given more than usual care and foresight. An antiseptic system was installed, at a cost of over twenty thousand dollars. The sewage is conveyed by underground pipes a long distance to solid concrete tanks, where the solids are disposed of by natural processes. The liquids pass through eight filter beds, and then enter the ditch colorless and odorless.

Bright Angel Camp. To accommodate those desiring less expensive quarters, Bright Angel Camp—old Bright Angel Hotel remodelled—is operated on the European plan. Rooms are one dollar a day each person; meals are obtained at Harvey cafe. The lodgings and fare here are of a much simpler kind than at El Tovar, but clean, wholesome, and thoroughly comfortable.

This Camp supplements the higher class service at the big hotel.

Transportation Facilities at El Tovar. Travelers who visit the Grand Canyon will be pleased to find an up-to-date livery service maintained in connection with El Tovar Hotel and Bright Angel Camp. They are thus able easily and comfortably to take pleasant sightseeing tours away from the hotel to obtain different views of the Canyon. Most visitors here do not realize that the granite gorge district of Grand Canyon alone is about seventy miles in length, ranging from ten to fifteen miles in width, and that from every accessible point along the rim a different outlook may be had, each unsurpassed of its kind. The transportation department is only one of the many pleasing details provided for the comfort of those who come to the Grand Canyon. It is thoroughly organized and equipped.

Trips to Take. At both El Tovar and Bright Angel, throughout the day and evening, will be found an agent representing this department. By means of telephonic communication between the hotels and the stables, these agents can provide in a surprisingly short time saddle-horses for a ride down one of the many bridle-paths, turnouts for a drive along the shady roads near the rim, or sure-footed animals for a

descent into the Canyon on Hermit Trail (now nearing completion), or Bright Angel Trail.

The Buildings in Detail. The several buildings of the transportation department, which are located among the trees a short distance from the hotel, across the railroad track, are all new and well built, being models in design and construction, and are thoroughly systematized for rapid service.

That portion of the stables where the animals are kept, and which accommodates about one hundred and fifteen head, is thoroughly equipped with the most approved methods for the care of the stock, including a complete system-for drainage and cleanliness; vermin proof, zinc-lined storage bins, and automatic self-recording feeding apparatus. Other departments are a blacksmith, carpenter and paint shop; harness, storage, and repair rooms, offices for the stable manager and his assistants; and a large wagon-room where the carriages, wagons, and other conveyances are housed. Visitors to this part of the stables will note an interesting feature in the painting of the vehicles, namely, that each is in the El Tovar colors, the body being dark yellow, and the wheels lighter yellow, striped with red. Each coach bears, in addition to the coat of arms of Pedro del Tovar, an individual name, selected from tribes of the Southwest Indians. For instance, visitors will recall having driven to various points on the rim in stages named "Navaho," "Supai," "Walpi," etc.

A large corral provides for the turning out of stock not in use.

Employees' Quarters. There is also a building devoted to the accommodation of the employees of this department, comprised of kitchen and dining-rooms, sleeping quarters, and a smoking, reading and recreation room.

The grounds around the employees' building, commonly called the mess house, are laid off into walks and gardens. Owing to the quantity and quality of the soil being superior to that around El Tovar (which is near the rim and therefore on almost naked rock), the grass, and the domestic and wild flowers, which are cared for by the men, thrive abundantly.

The Mallery Grotto. This is a small and rather insignificant cave just under the rim, to the extreme left (west) of El Tovar amphitheatre, wherein a number of interesting Indian pictographs are to be seen. The overhanging rock makes a rude cave or grotto, and it has been named Mallery Grotto, after Garrick Mallery, the great authority on the pictographs of the North American Indians. His latest monograph takes up the whole of one of the large volumes of the United States Bureau of Ethnology, and in its nearly eight hundred pages there are one thousand two hundred and ninety illustrations. To this illuminating book, therefore, the curious student is referred for further information regarding the pictographs themselves.

Trail to Mallery Grotto. Leaving El Tovar, the visitor can easily walk to and from Mallery Grotto in half an hour: Keeping on the rim, he passes the old Bright Angel Hotel, and all the buildings, about as far past the log house as, that is from El Tovar. There, in a slight depression, he will see the foot-trail leading down from the rim to the Grotto. It is a place about forty to fifty feet long, and with an overhanging wall of from five to fifteen feet high, and ten to twenty feet broad. The shelf upon which one walks is narrow, but I have slept there many a time in cold and rainy weather.

The pictographs are mainly in a rich brownish-red, and are of deer, mountain-sheep, men and women, serpentine lines suggesting the course of rivers, rain-clouds, lightning, and many-legged reptiles,—or what seem to represent these things. They were here, exactly as one now sees them, when I first camped here with some friendly Havasupais, nearly twenty years ago, and I was then informed that some of the designs represent great hunts, in which their ancestors had been successful.

Of the genuineness of the pictographs no one need have the slightest question. They afford a good opportunity to those who have never before seen such specimens of aboriginal art, to examine a fairly representative lot of them.

CHAPTER IV. The Grand Canyon At El Tovar

If guests at the Canyon will take this book in hand and, line by line, read this chapter, just as they would listen to the talk of a friend in whose knowledge they confide, they will leave the Canyon with fewer erroneous conceptions than are quite common now.

El Tovar Amphitheatre. The first thing to be observed is that El Tovar rests in the centre of the curve of a wide crescent, named El Tovar amphitheatre, the arms of which extend out into the heart of the Canyon, and shut in the scenery from the east and west, concentrating the view. These arms afford an excellent opportunity for seeing the various carboniferous deposits. The topmost is the cherty limestone, the layers of which lead the eye to the crossbedded sandstone, a creamy buff in color, and

composed of a soft, sugary sand. Each of these walls is from five hundred to six hundred feet high, though in some parts of the Canyon they are reduced to not more than four hundred feet.

Maricopa and El Tovar Points. El Tovar is six thousand eight hundred and sixty-six feet above sea level; the highest part of the point on the left is seven thousand and fifty feet, and on the right seven thousand feet. The point to the left, Maricopa Point, is a portion of the great promontory known as Hopi Point, to which all Canyon visitors should go. That to the right is El Tovar Point.

Heights and Depths. The height of the lime and sandstone walls can readily be measured by looking down upon the rudely carved mass of red sandstone slightly to the left, which has been called the "Battleship." The top of this is five thousand, eight hundred and sixty-seven feet above sea level. Now look up to the Maricopa Point above, seven thousand and fifty feet. The difference is one thousand, one hundred and eighty-three feet, which is practically the height of these two strata.

Bright Angel Creek. Almost at the first glance, the attention is arrested by the break in the north wall, slightly to the right of where we stand, which makes a wide lateral gorge running at right angles to the main course of the river. This is Bright Angel Gorge, showing the course of Bright Angel Creek, which flows between its lower walls. It received its name from Major Powell, when he and his party descended the river. Earlier in their explorations they had ascended a side stream, and one of the men had declared it to be a dirty devil of a river; and for many years it bore the name "Dirty Devil River," until Powell changed it on the map to Fremont River. When, later, this exquisitely pure and beautiful side stream was reached, the great explorer determined that as one stream had been named after the prince of the powers of darkness, he would name this after the bright and beautiful powers,—hence the name "Bright Angel."

A reference to the chapter "How the Canyon was Formed," will explain how this side gorge came into existence, and also account for the great upthrust of the granitic rock at its mouth, for the most casual observer cannot fail to note the presence of this rock much higher than it is seen elsewhere.

The North Wall. Before paying particular attention to the vast forms that crowd the interior of the Canyon, let us follow the "build" of the massive wall on the north side. This is part of the great Kaibab Plateau, the highest wall of the whole Canyon system. Its elevation is eight thousand three hundred, as against six thousand eight hundred and sixty-six feet at El Tovar, and it is thirteen miles in an air line from the south rim, where the hotel is located, to the north rim.

The reason for this difference in elevation is explained in the chapter "How the Canyon was Formed." In brief, it is that, during a process of " faulting," the north wall was thrust up above the level of the south wall.

Features above Bright Angel Creek. In any other region but here, this Bright Angel Gorge and the massive figures of rock that sentinel and guard it would be regarded as a scenic marvel, but here it is a mere trivial incident in the greater scenery of the greater Canyon. Yet it is well to note the massive red sandstone points that are lined up on either side on the plateau, above the darkest recesses of the gorge, reminding one of the rows of sphinxes that guard the entrances of some of the Egyptian temples.

Up Bright Angel Creek. Occasionally parties cross the river (either by boat or in an iron cage suspended by a cable), and ascend to the north rim by means of a rude trail up Bright Angel Creek. As the trail for a part of the way ascends the floor of the gorge, down which the stream flows, and as it is exceedingly narrow and without any way of escape in case of severe rain or flood, it is not always safe. To one, however, who loves a rough and adventurous trip, the ascent of this gorge will probably give great satisfaction. A little more than a third of the way up, a waterfall is passed, called "Ribbon Falls." The trail winds and twists with the course of the stream, and finally reaches the summit at an elevation of eight thousand five hundred feet, not far from Greenland Spring. From here one may go east over the Walhalla Plateau to Niji Point, and overlook the Chuar Valley at the mouth of Marble Canyon, where Dr. Walcott spent a winter studying the Algonkian strata of that region. To the west is Point Sublime, Powell Plateau, and other scenery of an unusually majestic character.

Features of the North Wall. But let us now return to the main north wall before us. The green tufts, that at this distance appear as grass or shrubs, partially covering the top of the wall and descending the slopes into the Canyon, are in reality great trees, mainly pines and black birches, from twenty-five to over one hundred and one hundred and fifty feet in height. The forest that covers the Kaibab Plateau contains many majestic trees, and some of these have wandered over the rim to peep into the depths of the abyss below. The cherty limestone strata are thus largely covered, but the next stratum is the clear band of cross-bedded sandstone, which corresponds to the second member of the geological series seen in the arm of the amphitheatre at Maricopa Point, and is from five hundred to six hundred feet wide.

Then the eye rests upon slopes of talus, which reach down to the red strata of varying thicknesses,

which are deposited above the red-wall limestone, the widest member of the whole Canyon group. These walls are cut and recessed into all kinds of shapes and forms, angles, promontories and recesses, which, especially in the early morning and late afternoon, cast shadows of inexpressible beauty.

The Red-Wall Limestone. We now come to the red-wall limestone nearly six hundred feet in thickness. What a striking, massive wall it is, and how impressive, when seen even at this immense distance. This wall is red only because it is stained by the color washed down by the rain from the red strata above. In reality, it is a rich creamy lime, but only where the red strata above have been degraded and washed away does the natural color of this wall appear.

The Plateau. Below the red-wall limestone, there are several strata of red and gray and olive rocks that slope to the plateau. This plateau is not quite so wide on the north side as on the south, owing to El Tovar being located in the recess of a great amphitheatre. It is from these plateaus that the finest views of the real Canyon can be obtained. The visitor, sitting on the porch or on the rim at El Tovar, cannot realize that below his feet, as it were, there is an almost exact duplication of the wall and slopes of talus, the thrilling precipices, the alcoves, recesses, promontories and the like, that he sees on the north side. And yet a trip down the trail on to the plateaus reveals these stupendous facts in a manner that is surprising even to those who, for years, have been familiar with them. How much more, then, is such an experience to a tyro. I have met men who were world-wide travelers, and who were visiting the Canyon for the first time; some of these were expert geologists, yet they refused to go down the trail, with the excuse that they could fully grasp the scenery from the rim. But that is impossible. The human mind cannot realize the effects of vastness and power this Canyon scenery produces, except when one stands below the cliffs and looks up. And where the opportunity is given of looking both up to towering walls, and down over beetling precipices, the effect is enhanced.

The Tonto Sandstones. Below the plateau, slight slopes lead the eye to the last of the stratified rocks, the Tonto sandstones of the Cambrian period. These are readily distinguished, mainly by their deep buff color and the fact that generally they are found resting on the archaean or unstratified rocks, locally though incorrectly termed the granite, which makes the Inner Gorge through which the river runs. This "granite" is in the main a blackish gneiss.

The Algonkian Strata. Though the Tonto sandstones usually occupy the location named, there is a deviation from this in the presence of some remnants of strata of the Algonkian period, directly opposite El Tovar. This deviation is discussed in the chapter "How the Canyon was Formed." These remarkable rocks occur to the left (west) of Bright Angel Creek, and lie immediately above the gneiss. Their brilliant red reveals them, and they can be followed up under the base of the Cheops and to a small wash to the left of Osiris. At the mouth of Bright Angel, they rest upon the archaean, with the Tonto sandstones above them, but just in front of the Battleship a break in the gneiss occurs, and on the portion nearest us the Algonkian strata totally disappear, for the Tonto strata rest directly upon the gneiss.

Zoroaster, Brahma and Deva Temples. Now, in turn, let the eye rest upon the temples, towers and buttes that stand in the heart of the Canyon, more or less detached from the main wall. To the right of Bright Angel Creek, striking buttes keep guard. The nearest is an angular mass of solid, unrelieved rock, sloping in a peculiarly oblique fashion. It is Zoroaster Temple, seven thousand one hundred and thirty-six feet in elevation. Close behind it is a more ornate and dignified mass, Brahma Temple, named after the first of the Hindoo triad, the supreme creator, to correspond with the Shiva Temple, soon to be described, on the right. Shiva, the destroyer; Brahma, the creator. The one controlling the forces that have destroyed the strata; the other dominating the powers that have brought these structures into existence. Brahma is seven thousand five hundred and fifty-four feet in elevation. Behind Brahma is another butte, which, however, cannot always be dissevered from the main wall. It has no cap of cherty limestone. It can be readily discerned, therefore, by its flat-topped appearance. It is Deva Temple, seven thousand three hundred and forty-four feet above sea level.

Buddha Temple and Cloister; Manu Temple. To the left of the Bright Angel Gorge, quite an assemblage of buttes awaits inspection. The dominating pile almost opposite Brahma—across Bright Angel—is Buddha Temple, and below it is Buddha Cloister. Beyond this is another butte, which, however, at times, can scarcely be detected from the main walls of the Kaibab. Yet it is a separate butte of great proportions, and is named Manu Temple, after the great law-giver of the Hindoos. Buddha's elevation is seven thousand two hundred and eighteen feet, while Manu's is seven thousand one hundred and ninety-two.

Cheops Pyramid. To the left of Buddha Temple, and nearer to us, is a massive though less ornately carved monument than Buddha. It is Cheops Pyramid, a detached mass of the red-wall limestone, which, however, is rapidly losing its red color, owing to the disappearance of the red strata from above. Cheops is five thousand three hundred and fifty feet in elevation, and is of a peculiar shape, as of some

quaint and Oriental device of symbolic significance.

Isis and Shiva Temples. Just above, and farther to the left, is a peculiar temple, resting upon sloping taluses of the red strata beneath, its cap formed of alone, narrow ridge of cross-bedded sandstone. It has two great cloisters in front, and is named Isis Temple, after the feminine god of the Egyptians. Isis has an elevation of seven thousand twenty-eight feet, and is the eastern support of the gigantic rock mountain which towers over all the lesser structures. This is Shiva Temple, a solid mass, sliced off from the main Kaibab. The elevation is seven thousand six hundred and fifty feet, and it is thus described by Dutton, who named it: "It is the grandest of all the buttes, and the most majestic in aspect, though not the most ornate. Its mass is as great as the mountainous part of Mount Washington. The summit looks down six thousand feet into the dark depths of the inner abyss, over a succession of ledges as impracticable as the face of Bunker Hill Monument. All around it are side gorges, sunk to a depth nearly as profound as that of the main channel. It stands in the midst of a great throng of cloister-like buttes, with the same noble profiles and strong lineaments as those immediately before us, with a plexus of awful chasms between. In such a stupendous scene of wreck it seems as if the fabled 'Destroyer' might find an abode not wholly uncongenial."

Horus Temple. Guardian temples to the west of Isis are Horus and Osiris. The former is nearer to the river. It is capped with the white sandstone, and is so closely sculptured that white fragments have fallen upon the sloping red talus beneath. The whole appearance is not unlike a giant hat of an Arab, with its streaming folds of white reaching far over the neck down the back. It rests upon a massive block of the red-wall limestone, which presents a bold face to the east. Its elevation is six thousand one hundred and fifty feet.

Osiris Temple. Behind Shiva is Osiris Temple, with an elevation of six thousand six hundred and thirty-seven feet. At the proper angle it is seen to be as prominent before Shiva as is Horus, but our angle of vision gives it the retreating effect. It is a gracefully domed temple in the cross-bedded sandstone, and clearly reveals its five hundred feet superior height over Horus.

The walls seen behind Osiris are not those of Point Sublime, as some suppose. This massive promontory on the north side is hidden by the nose of Maricopa Point. The walls are a portion of the Kaibab Plateau, leading towards Point Sublime, but not a part of it.

Ra Pyramid. In front of Horus is the tower of a symmetrically constructed pyramid in the red strata, far more like Cheops than is the structure of that name. It is five thousand nine hundred and ninety-seven feet above the level of the sea,—a memorial of the great Ra, far greater than any temple erected by human hands.

The Maiden's Breast. At the end of Maricopa Point is a majestic structure bigger than many national capitols combined, yet so small here as hitherto to have passed unnoticed. It is crowned, however, with a small nipple in red sandstone, to which the Havasupais give a name signifying the Maiden's Breast. It is five thousand four hundred and fifty feet high,—quite a height for any earthly maiden.

Miles of Walls of Varying Lengths. As we look at these wonderful walls, a new idea dawns upon us. The engineer tells us that the Canyon is two hundred and seventeen miles long. That, however, is only the length of the river, as it runs its winding way along. But the walls cannot thus be measured. Take the red-wall limestone and follow it on its devious way, in and out of deeply alcoved recesses, up side gorges and down again, around the curves of cloisters and along the bases of the great buttes. The aggregate distance followed will be many thousands of miles. The strata that have the longer course, on account of their greater extent of terracing, are those that make an eight-hundred-feet-wide band of gray and bright red sandstone, which rests above the red-wall limestone.

Angel Plateau and Indian Garden. Now let the eye fall upon the plateau beneath. This is named Angel Plateau. The green near its centre has the first claim. This green patch is called Indian Garden, for in past years, before the white man wrested his possessions from him, a certain family of the Havasupais used to farm in a crude way on this spot. When I first visited this plateau, some seventeen or more years ago, the remnants of the old Indian irrigating ditches could be seen. Now it is cultivated by the white man to good effect, and delicious watermelons and cantaloupe as well as tasty vegetables grow in abundance. This is called half-way down to the river in distance. The elevation is three thousand eight hundred and seventy-six feet, so that from our six thousand eight hundred and sixty-six feet we gaze down two thousand nine hundred and ninety feet. Many who go down the trail do not go below this plateau. A point can be seen, also the line of the trail leading to it, from which an excellent and extensive view of the raging river, with some of its rapids, may be had.

CHAPTER V. Three Ways Of Spending One Day At The Canyon

There are many who can take only a hasty trip to the Canyon. This is to be deplored, as the Grand Canyon is one of the sights that cannot be fully comprehended in a day; and yet, if one has but a day, to get merely one good long glimpse at it is worth all the effort and expense that it may cost, even to the least wealthy of its visitors. And while it cannot be too strongly urged that all who come prepare themselves to stay at least a week—a month is far better—I offer a few practical suggestions to those who have less time, and wish to use it to the fullest possible advantage.

Three Suggestions to the "One-Day" Visitor. To those who have but one full day, a choice is offered of three courses; first, and best of all, to drive to the head of Hermit Trail on the new Hermit Rim Road, and to visit Yavapai and Hopi Points; the second, to drive to Grand View; the third, to ride down Bright Angel Trail.

First Trip—An Afternoon on Hermit Rim Road to Head of Hermit Trail. To the less strenuous visitor who wishes to see all he can in one day without the fatigue of the trail trip, two courses are open, both of which include driving to prominent points on the rim and sightseeing in their vicinity. One is to drive out on Hermit Rim Road, which drive will give a variety of scenery unequaled by any other trip to be made on the rim. This trip, giving panorama views to the west of El Tovar, can be made in one half of the day, let us say the afternoon, leaving the morning for a drive to Yavapai Point, which gives corresponding panoramas to the east, though Yavapai is only three miles from the Hotel.

It is nine miles west of El Tovar to the head of Hermit Trail on the new Hermit Rim Road, and about three and one-half hours are required for the trip in addition to whatever time is consumed in sightseeing at the various points on which stops are made.

The road passes Maricopa, Hopi, Mohave and Pima Points, and some time is spent on each, as there is some special appeal in the buttes and the cliffs and the depths as seen from each, but all along the route the gigantic panorama of Grand Canyon stretches for miles and miles—a world of beauty; all along the route the attention is claimed by some surprising feature,—the precipices of the opposite wall, the great interior rock temples, and side canyons, and everywhere the incomparable colors.

A picturesque shelter house is to be constructed at the end of the road, which is near the head of Hermit Trail, where visitors driving on the Rim Road may rest before returning to El Tovar or before starting down the trail.

On the return journey the scene is entirely different, owing to the magic of the sun's shadows, which have changed the aspect of every wall and chasm and temple—whether in the gorge below, or across the river and up the side canyons to the Kaibab Plateau on the north rim, and from October to May, during the shorter days, if the return is made late in the afternoon a stop will be made at Hopi Point, one of the best points on the south rim from which to watch the glories of the setting sun.

A chapter describing the Hermit Rim Road and Hermit Trail will be found in this book, but from no description can one comprehend the magnitude and the silent grandeur of the Canyon as they are impressed upon the senses from this highway and from this trail.

A Morning Trip—To Yavapai Point. Though Yavapai Point is but three miles away, the drive and the time required for sightseeing occupy about two hours. Leaving El Tovar, the road plunges among the trees at once on passing the railway. Here are pines, pinions and junipers, with a sprinkling of scrub oaks, and the flowering bush with white flowers and long velvety tendrils locally known as the cinchona. Here and there a yucca baccata thrusts out its bayonets from the ground, as if in warning, and a score or more of flowers give variety of color to the greens of the trees, in due season.

Outlook from Yavapai Point. Arrived at Yavapai Point, the river can be clearly seen at two different places; before us, directly across the Canyon, is the Bright Angel Gorge, with a full view of Zoroaster, Brahma and Deva Temples. To the right, the nearest promontory is Yaki Point. Below the point, its continuation terminates in a butte of great massiveness, which has been named O'Neill Butte, after the Arizona pioneer who was slain during the charge of the Rough Riders at San Juan Hill. Beyond Yaki Point, in the far-away east, two other great promontories arrest the attention. These are way beyond Grand View and the old Hance Trails, and are Pinal and Lipan Points, leading the eye to a "wavy" wall, slightly to their left. This wall, topped with a series of curves, is the western wall of the Little Colorado River; and the smoother wall beyond, to the left, is the further or eastern wall. Here this tributary river and canyon connect with the Grand Canyon, from a general southeasterly course. It will be recalled that transcontinental travelers cross the Little Colorado River at Winslow. From that point it flows in a northwesterly direction, through the sands of the Painted Desert, its banks bearing many and large cottonwood trees.

Wotan's Throne. Two majestic buttes in the heart of the Canyon, to the east, have been demanding our attention for some time. They are both towering mountains of rock, that stand out even more

strikingly than do the temples near at hand. The flat-topped mass is Wotan's Throne (once Newberry Terrace), and is as massive as Shiva Temple, seen to the west. Its elevation is seven thousand seven hundred feet.

Vishnu Temple. The more ornate and sculptured of the buttes is Vishnu Temple, a solid mountain of rock carved into a majestic form by centuries of erosion. Wherever one stands, at the eastern end of the Canyon, whether on the north or the south, on the promontories at the rim or on the plateaus beneath, it is the dominating and eye-compelling object. It is, without doubt, the most stupendous mass of nature's carving in the known world. It is seven thousand five hundred and thirty-seven feet above sea level, and over five thousand feet above the Colorado River, which practically laves its base.

In front of Wotan's Throne, and a trifle nearer the river, is the Angel Gate, described in the chapter on Indian Legends.

Indian Garden. Now let the eye fall upon the Bright Angel Plateau. The tents at Indian Garden are clearly to be seen as well as any trail party that may happen to be crossing the plateau. The insignificant size of the horses and mules and their riders can scarcely be believed. On the rim the elevation is seven thousand and eighty-one feet. At the Garden the elevation is three thousand eight hundred and seventy-six feet, so we are looking down four thousand two hundred and five feet, over three-fourths of a mile.

Immediately below us, to the right, we see the rugged gorge of gneiss in which flows Pipe Creek. The left fork of this (to the west) is Garden Creek. A small break from Angel Plateau will be observed, where Garden Creek curves to enter Pipe Creek. Here is a beautiful mass of green, and not far away the trail that leads from the plateau to the river is in sight.

El Tovar Point. A quarter of a mile west from Yavapai Point is El Tovar Point (formerly called Grandeur Point), so named because it is the end of the right arm of the amphitheatre in which El Tovar is located. Its elevation is seven thousand feet.

Coconino Forest and Angel Plateau. To the west and south is the Coconino Forest; beyond is seen the dry bed of the ancient Eocene lake, and the blue ridge, where the lava-flows from Mount Floyd shut in the view. It is a glorious expanse of over a hundred miles, and on a clear day every object is plainly discerned. Here even better views of the Angel Plateau may be obtained than from Yavapai Point, and an excellent outlook over the narrow break in the great wall, where the shattering of the strata and the deposition of talus and vegetable matter made possible the building of the zigzag portion of the trail near the top. The faulting of the strata is clearly seen, and the observer will not fail to note that the strata of the left arm of El Tovar Amphitheatre are thrust up some one hundred to two hundred feet above the level of the same strata upon which El Tovar itself stands. This is one line of the Bright Angel fault, which extends across the river, and accounts for the carving out of the Bright Angel Gorge as described in the chapter "How the Canyon was Formed."

How exquisite is the rich beauty of the greens of the Douglas spruces, and the vegetation on the upper part of the trail, contrasted with the reds and grays and creams and buffs of the rocks around!

The round trip from El Tovar to Yavapai Point is about six miles. A foot-path has been cut from El Tovar to El Tovar Point, so that visitors may walk to and fro between these so diverse and yet equally attractive outlooks over the Canyon.

Many visitors, however, after the drive to Yavapai Point, go to Hopi Point. And, while this point is passed on the Rim Road drive, it is also very popular as a morning drive.

Drive to Hopi Point. This point is three miles to the west, and is just beyond Maricopa Point, which is practically the left arm of El Tovar Amphitheatre. The round trip is about six miles, taking in both points, and occupies from an hour and a half to two hours. Those who go in private conveyances generally stay longer, and make a three-hour trip of it.

Leaving El Tovar, the road turns southwest for a short distance, and then enters the forest to the north. It is a restful drive over a section of the well-made Hermit Rim Road.

View at Hopi Point. The first impression when one arrives at Hopi Point is of the nearness of the buttes, and the sheer precipitousness of the place upon which he stands. Both are owing to the fact that Hopi Point is thrust far into the heart of the Canyon. Its elevation is seven thousand and forty-nine feet.

Dana Butte. Immediately facing the visitor, a continuation of Hopi Point at the five thousand and twenty-five foot level, is a butte that would dwarf into insignificance the most stupendous of all the world's city sky-scrapers, yet here it is hardly noticeable in the wealth of more massive and majestic structures. It is Dana Butte, so named after the great geologist. Across the river, which here can be

seen in five different places, are the temples to the right or east of Bright Angel Gorge, while Buddha and Manu on the left (west) are equally in evidence. But right before us is the dominating mass of Shiva Temple, with Isis Temple and Cheops Pyramid guarding it on the right. To the left, new architectural forms and masses come out into clearer view, two of these being stupendous structures of great beauty and majesty that guard the approach to Shiva Temple. These are Osiris and Horus Temples, the latter being in front.

Tower of Set. Just before Horus is a smaller but massive structure, known as the Tower of Set. The elevation of Osiris above sea level is six thousand six hundred and thirty-seven feet, that of Horus six thousand one hundred and fifty feet, and of the Tower of Set five thousand nine hundred and ninety-seven feet. Beyond these, to the west and north, are Confucius and Mencius Temples, the latter being the nearer. These are respectively at an elevation of seven thousand one hundred and twenty-eight feet and seven thousand feet. The eye now rests on Point Sublime, the spot where Captain Dutton indited his vividly descriptive accounts of the Great Canyon.

Marsh Butte. On this side of the river, nearly opposite Mencius Temple, is a butte of singularly beautiful structure, of an elevation of four thousand seven hundred and thirty feet. This is named Marsh Butte, in honor of the great paleontologist, the rival of the equally great Cope. In the far-away distance is Havasupai Point, the most notable of all the points of the south rim, because of its great projection over the river.

Dutton Point. Across from Havasupai Point, on the north side, is the mass of Powell Plateau, the "nose" of which, facing this way, is named Dutton Point, after the poet-geologist. Beyond, in the faraway distance, is to be seen the curve of the Canyon wall, at the great bend of the river, where the granite disappears from the Inner Gorge, and, resting upon the paler blue of the horizon, is the line of the Uinkaret Mountains in Southern Utah, about sixty-five miles away. What a wondrous outlook it is!

On returning, a short stop is made at Maricopa Point, where the views are much the same, but changed by the new angle of vision. It is one of the great charms of the Canyon that each point of view, even though not more than half a mile away, reveals new and interesting features of the stupendous wonder.

Second Trip—Drive to Grand View. This is a fourteen-mile trip, over a fairly good road, made in comfort in two and one-half hours. One may stay from two to four hours, observe all he wishes to see, and return to El Tovar in another two and a half hours, thus making twenty-eight miles for the round trip. The drive is through the Coconino Forest, by narrow canyoncitos (little canyons), washes, and through grassy glades and royal parks, where one need not be surprised at any moment to see deer or antelope bound before him. A full description of this trip is found in the chapter devoted to Grand View and its trail, the scenery being too varied and important to be hastily described.

If one has but one day, and he wishes to spend it on the rim, the Grand View trip may be made with a limited amount of time devoted to sightseeing at that point, so that on the return the drive may be taken to Hopi Point in time to view the sunset. This, however, can usually only be done in the summer months, when the sunset is late enough to afford time.

Third Trip—Down Bright Angel Trail. To an ordinarily well person, there is neither danger nor serious fatigue in this trip, but it is not to be ignored that riding down, down, down, for four thousand four hundred and thirty feet (the difference in elevation between the rim and the river) puts a pressure upon certain generally unused muscles, so that one returns tired. But it is a healthful fatigue, and invariably benefits all who experience it. To go down the trail and back is enough to accomplish in one day, unless the visitor is very "strenuous," although not a few do take the drive out to Hopi Point and see the sunset, upon returning from the trail trip. Those who take this ride down the trail, after arriving on the morning train, do not go as far down as the river. They visit the Indian Garden, and are then taken out to a prominent point of Angel Plateau, and there obtain a fine view of the river. From the scenic standpoint, this is much to be preferred to going down to the river itself, especially when time is limited. The trail to the river is down a side gorge, where one's view is materially obstructed, and while there is great satisfaction in standing immediately before the river itself, and seeing it roll along between the gloomy walls of the Inner Gorge, one does not see as much of it, or in so striking a setting, as from the plateau, one thousand three hundred and twenty feet above.

If one is determined to go to the river, however, it will be necessary for him to arrange for a special guide, and push along down the trail with vigor, for the regular trail party for the river leaves at 8:30 A.M., while the train does not arrive at El Tovar until about 9 o'clock, and one may wish to take breakfast before starting. Hence the start is seldom accomplished until after ten o'clock, two hours beyond the allotted time.

Sunrise and Sunset at Hopi Point. It already has been pointed out that this is the strong scenic point

near to El Tovar, for both eastern and western canyon scenery, though the eastern is not so fully revealed as from Yavapai Point. Regular conveyances take visitors out to this point both morning and evening. The scenic effects are heightened in the Canyon a hundredfold by the presence of the morning and evening shadows. In the glare of the midday sun, the temples, towers, walls and buttes lose their distinctiveness, while in the shadows of either early morning or the late afternoon, they stand forth as vividly as a profile cameo cut in black on a light ground. As the hours of sunrise and sunset vary, the drives are so planned as to reach the points at the proper time, so as not to weary the visitor by too long waiting, or lose the enchanting effects by too late arrival. As the sun sinks, the shadows lengthen and deepen, bringing out into bold relief features hitherto unobserved, and giving a sublimity to the vast scene that it did not possess in the full blaze of the sun. If clouds obscure the direct rays, all the better, for then other and even more startling effects of beauty and color are produced. At times the whole Canyon seems filled with a luminous mist, in which the temples float into individual prominence in a remarkable manner.

Then, as the vision is turned to the east, one may see the shadows gradually, and, at the last, rapidly rise and shut off the peach glows, the vermilions, the absolutely fiery lights, that often blaze in lingering affection on the peaks they love so well to illumine. No two nights are the effects the same. One can never grow weary of watching them. Sometimes the tones are soft and tender. Again the vividness of the flaming colors is as if the god of color were declaring his power, and demanding special homage. From the soft tint of rose-ashes to the fiery red of a blinding sun, the whole gamut of colors and effects is used. The afterglow is by many considered more alluring than the sunset itself.

The Canyon Before Sunrise. An exquisite effect is seen by those who watch the Canyon before sunrise. A soft flood of reddish purple fills the vault, and rests in perfect harmony upon the great north wall. Little by little the darker tints are subdued, every moment adding to the charm of the changing effects, until suddenly the sun bursts over the horizon, floods the plateaus with light, or casts dark and richly purple shadows, and this sets wall and recess, mountain butte and deep abyss in startling contrasts.

Returning in Time for Trains. One thing should be noted about these rim or trail trips. They are all planned so as to afford ample time for meals before and after making them and also to insure the catching of trains. The Fred Harvey system runs in harmony with the Santa Fe Railway system, so that no matter how nervous the visitor, he may rest perfectly contented that when he goes on any of these trips he will always be back "on time," both for meals and trains.

CHAPTER VI. How To Spend Two To Five Days At El Tovar

Suggestions for Two Days. Suppose the visitor to the Canyon arrives in the morning on an early train and must leave the next night; how can he best fill in his time?

In the morning of the first day he should take the popular drives to Yavapai and Hopi Points, and the afternoon can be spent in driving out on the Hermit Rim Road to the head of Hermit Trail, with a stop, returning, to view the sunset from Hopi Point.

The second day can be well spent in going down Bright Angel Trail.

Suggestions for Three Days. If the visitor has three days at his disposal, let him spend the first day on Hermit Rim Road; the second day he can drive to Grand View and enjoy the eastern end of the Canyon. These trips will give him a general outlook over the Canyon from all the salient near by points on the rim, El Tovar, Yavapai and Grand View on the east, and Maricopa, Hopi, Mohave and Pima west on Hermit Rim Road, and an extensive panorama stretching many miles from the end of the road.

The next day the Bright Angel Trail trip may be made, and at the end of the third day on returning from this trip, the traveler will be able to assert with truthfulness that he has gained a reasonably comprehensive view of Grand Canyon.

Suggestions for Four or Five Days. If one can spend four or five days, and wishes to fill every hour with travel and sightseeing, he can take one or all of the day's experiences already suggested.

To the Boucher Trail. Then let him plan either to ride a saddle animal or be driven to the head of the Boucher Trail (about six thousand five hundred feet elevation) through the forest to the west, by Rowe's Well, a distance of ten miles. This trip can be made in about two hours. If one has been driven to this point, the harness is removed from the horses, saddles substituted, and the descent of the trail begun.

Dripping Spring. It is a little over a mile to Dripping Spring, which is at about five thousand four hundred and ninety-three feet elevation. The trail descends easily at first through a beautiful wooded

canyoncito, where it is completely hidden and embowered in foliage. Then it winds its way down and around the cherty limestone, to the top of the cross-bedded sandstone, down which zigzags and steps lead one to the spring itself. This is located in a picturesque spot. Picture a great, overhanging wall at the very bottom of the cross-bedded sandstone, from twelve to fifty and more feet high, the recess being perhaps thirty or forty feet back. From the rocks above, with a drop of about fifteen feet, seeping through a green cluster of maidenhair ferns, the pure water of the spring drips into a stone trough placed to receive it. Day and night, winter and summer, fair weather or foul, it seldom varies its quick, tinkling, merry drip, drip into the receptacle below. Below the trough, a natural cavity in the rocks receives the overflow, and here, within the pool and on its edges, aquatic and other plants grow in profusion. By the side of this ever-flowing water, Louis Boucher, the builder of the trail, has his simple home camp. Two tents, placed end to end, rest against the wall, well protected from sun and rain, though the morning's sun shines in freely. Below is a corral for horses, mules and burros used on the trail.

Hermit Basin. Here, after lunch, one continues on his trail trip to the river. For three miles the trail winds in and out of the recesses, on the easily rolling ground of the plateau. There are no sharp descents. For about half a mile the trail is in Dripping Spring Amphitheatre, an alcove on the edge of Hermit Basin, so named by Louis P. Brown, a miner and prospector, who, in the early eighties, made this basin his home while engaged in prospecting operations in the Canyon.

As the plateau passes across the basin and out to the open Canyon, the scene becomes more and more enlarged, until it is stupendous and vast beyond description. Down on the right, Hermit Creek cuts its narrow path deeper and deeper, until it reaches the red-wall limestone, where it makes a narrow gorge, that, from the elevation of the plateau, seems more like a mere slit in the rock than a gorge. Louis Boucher assures me that it is so narrow and deep that he has seen stars from its recesses at midday, and I record his statement in spite of the fact that eminent astronomers have told me that such a sight is impossible. Anyhow, the effect of that stupendous descent is such as to almost make the rider on the trail see stars, though there is no danger to any one with ordinarily steady nerves. Two miles out, one sees the continuation of one arm of the Bright Angel fault in the shattered strata of the red sandstone, some masses of which are toppled over at the base of Pima Point. It was this fault that made the talus slopes, down which the Boucher Trail descends, and also the great eroded recess of Hermit Basin.

Columbus Point. The nose of the plateau on which we have been traveling, now directly under Yuma Point, is named Columbus Point, and from this spot, where several noted American painters have made paintings destined to become memorable, the outlook in three directions, east, west, and north, forms one of the noblest of all the panoramas of the Canyon my eye has ever rested upon. Shiva's Temple is almost directly opposite, as we look towards the northeast. Stretches of the river are exposed east and west, where raging rapids send up their roar to us. Overhead is a great castellated structure, surmounted by a lesser building, with a round tower, embattlements and all the architectural accompaniments of an elaborately equipped castle of ancient Europe. An attempt to describe all the objects seen in the heart of the Canyon is needless. Suffice it to say that the panorama takes in every tower, temple, butte and structure, seen from Point Sublime on the north side; or any of the points on the south side, from Havasupai Point on the east, to Yavapai Point on the west; and includes Wotan's Throne, Vishnu Temple, and the wall of the Little Colorado to the faraway east.

On the Lower Trail to the River. The trail then winds under Yuma Point, and zigzags down the thinner strata of the red sandstones on to the red-wall limestones, where it affords more extended views on a lower plateau of lesser area, the rocky butte on the end of which is named Bunker Hill Monument. From this plateau another rapid descent is made through masses of rock to the bed of Long (or Boucher) Creek, where, at the distance of about a mile from the river, is located the lower camp. Here Boucher has planted a garden of all kinds of vegetables, and with seventy-five trees, which include oranges, figs, peaches, pears, apricots, apples, nectarines, and pomegranates; he boasts of his melons, canteloupes, beets, onions, tomatoes, chile, carrots, cucumbers, parsnips, etc., and I can vouch for the sweet and refreshing qualities of his melons. Tomatoes, ripe and green, covered his vines in January, and he has them throughout the year. It needs no comment to explain how delightful fresh vegetables are, after one has made this trail trip, especially if it should be in the hot summer months.

Good and comfortable beds and other camp accommodations are provided here, so that a stop may be made over night. In the morning, the river is visited, and the return trip accomplished in easy time for dinner. The distance from rim to river has not been measured, but it is estimated to be from eight to ten miles.

Boucher also has a copper mine, rich in mineral. He claims that it is a continuation of the copper ledge of Bass's mine, and is possibly the same deposit that continues east to the Canyon Copper Company's mine on the Berry Trail.

The return trip can be made over various routes, including the ascent of Bass or Bright Angel Trails, but a majority of visitors will wish to return by way of Hermit Trail, across Hermit Basin from Boucher Trail. In that way they will get the experience of using two trails with their different outlooks and a journey across the plateau down in the Canyon, as well as a drive back to El Tovar on Hermit Rim Road.

CHAPTER VII. How Fully To See And Know The Grand Canyon Region

Advantages of Camping Trips. The suggestions in this chapter are mainly for the strenuous and strong, though this by no means excludes members of the gentle sex. Many women and girls—some who have never before been on horseback—have made these extended trips, even those that have required weeks of rough camping. For detailed particulars of the scenery, those interested are referred to the various chapters devoted to the respective trails. The transportation department at El Tovar is under the control of competent men, and is thoroughly well equipped to send visitors on prolonged camping trips with everything needed for a week, a month, or six months. It is merely a question of time and meeting the necessary expense. On the occasion of my last visit to El Tovar, a small party of both sexes was equipped and started out for a trip to last fully three weeks. Reference to the chapter entitled "Across the Grand Canyon to Point Sublime," mainly written as her diary by an elderly lady, will give the ideas of a woman who had next to no previous experience of the hardships, as well as the immediate enjoyments of such a trip. But no one can estimate the continual source of delight and pleasure the memories of such a trip are to those who have resolutely faced and overcome the merely temporary discomforts entailed. The experiences with the burros, the surprises of the scenery, the exquisite delight of the perfect rest and dreamless sleep one enjoys, after the first few nights of novelty are worn off, the satisfaction of seeing and knowing much of the most sublime piece of natural scenery on earth, are compensations and satisfactions enough.

Down Bright Angel Trail. After one has gained the slight knowledge of the Canyon afforded by the easier trips described, let him plan to make the following as "a starter" in his more thorough investigation. With a good guide, pack animals carrying a full equipment of sleeping, cooking and eating necessities, plenty of water in canteens, one or two extra canvasses in case of rain, a note-book, and pencils or fountain pen, a compass and barometer for altitude readings, and the United States Geological Survey maps of the region, one is ready to make a "good start." Descend the Bright Angel Trail to the river, study the formations all the way down; get a clear idea of the relative positions of the strata, and learn to detect them by the individualistic appearances of wall, temple, butte, etc.; and examine the so-called cliff-dwellings hidden away in the Tonto sandstones before descending on the gneiss into Pipe Creek Canyon. Arrived at the river, spend a day there investigating the peculiar foldings and tiltings of the Algonkian strata. Sleep, as did Powell and his men for weeks, on the sands of the Colorado River, with the noise of the rapids ever in your ears. Breathe the pure air, and watch the solemn march of the stars.

Have you ever noticed how delicious the most ordinary food is, when cooked and eaten in the open air, after a day of reasonable exertion? Climbing, riding, and walking expand the lungs, and this means the absorption of immeasurably more oxygen. Weak stomachs, fickle appetites, dyspeptic symptoms, insomnia, blue devils and a score of the ills that human flesh is heir to, disappear before the floods of sunshine and oxygen that bathe the body, inside and out, of the man or woman who gladly accepts the outdoor life, even though only for a short time, in this Canyon region.

These philosophizings are aroused by the smell of bacon frying over the camp-fire, or the crack of a fine, mealy Arizona potato, roasting in the ashes, or a whiff from the coffee-pot, just about to topple over on the burning sticks. The fire is made of driftwood washed down possibly from some storm-swept region where a Mormon dwells with his numerous family; or, mayhap, from a forest where the elk of Wyoming still roam.

How real life in this Canyon now begins to be. It is opening up its secrets to us as we thus come into it. We are learning to love it, therefore it shows its heart to us. It no longer is a "thing" to be looked at; it is a real something, an individuality to love, to listen to, to question, to honor.

On the Tonto Trail. We are now ready to go over the old Tonto Trail the trail made centuries ago by mountain sheep, small bands of which are still to be found in the remoter corners of the Canyon—then followed by the Indians, whose moccasined feet made less impression upon it than did the hoofs of the sheep. And in the two or three decades just passed, a few white men trod it. Perhaps Powell, or some of his men, or Stanton, walked where we now walk, or ride, and surely some of those early mining prospectors of the Canyon—Ashurst, McClure, Marshall, Hance, Boucher, Berry, Brashear,—once went this way.

In and out of the recesses of the much carved walls, up and down the wavy ridges of the plateaus, sometimes descending into deep side gorges, we ride, our guide leading the way to the Grand View Trail, and our pack-mules and burros following, while we occupy the rear of the procession. We stop for noon lunch in one of the side canyons where is a spring of clear water. We take off the packs from the animals, and let them nibble away at the rich grama and gallinas grasses that flourish here after the summer rains.

Comfortable and contented after our meal, we lie on our backs under the shelter of a juniper or a friendly cottonwood, or in the shade of an immense block fallen from some cracked wall above. Already we are becoming familiar with the strata, and can call each one by name. The red wall limestone, we find, is known to the guides and miners as the "blue lime," owing to the fact that its capping stratum, where exposed, has a light blue color.

Cottonwood Creek and Horseshoe Mesa. In due time we reach Cottonwood Creek, which flows down to the left (west) of Grand View Point. Here the plateau opens out, but we leave it in order to follow the creek, on the Berry Trail down to the river. Perhaps we spend the night here, and in the morning ascend to the mesa on to the Tonto, then up the well-engineered trail to Grand View Cave (see description in chapter on Grand View Trail). Sending the pack animals on from here, we wait until some one descends from the near-by Horseshoe Mesa, where the camp of the Canyon Copper Company is located, with candles ready to conduct us through the wonders of this natural excavation in the red-wall limestone. This occupies the whole of our afternoon, so that when we reach the mesa, we are ready to partake of the substantial and cheery fare of the Camp, and then unroll our blankets, lie down, listen to the chat of the miners and guide, hear them recount some of their thrilling and exciting experiences, enjoy their singing of old-time melodies, with a peculiar western flavor to them, and then roll over to dreamless sleep.

Copper Mines. Half a day can be well spent on the morrow in the mines, and one is surprised to find here over half a mile of tunnels and shafts, with workings on seven levels, and ore so rich that under usual conditions it pays to mine, sort, pack on mules three miles or a little more to the rim, place in wagons, haul some fifteen or twenty miles to Apex, load on railway cars and ship—paying full freight, of course—about six hundred and eighty miles to El Paso, Texas, where it is "milled," and the copper, silver and gold extracted. These various processes are expensive. It costs to buy grain in Flagstaff, or Phoenix, and pay freight on it to Apex, and then haul it to the head of the trail, and thence to the stables on the plateau near the mine. Hay, too, has to come just as far. Every pound of the provisions used by the men has to be hauled in similar fashion over railroad, wagon road and canyon trail. Every pick, shovel, piece of iron or woodwork, every pound of powder, dynamite and fuse, every box of candles has to pay toll in like fashion, before it can be used in the mine. So we are not surprised to learn that the ore is rich, the first thousand tons mined going as high as thirty percent in copper, with several ounces of silver to the ton, and small but appreciable and valuable traces of gold. (At the time of this writing, the mines are temporarily shut down.)

To the Old Hance Trail. The mouth of the mine enters the face of the cliff to the east, and overlooks the trail down which we descend into Hance Creek, where the old Hance Trail to the river used to be. It is an old friend, for we have been down it more times than once, and can recall every feature. We rest awhile here, in order to go down to the place where the side canyon through which the creek flows "narrows up." We pass through, and on the other side stand before the shattered Tonto sandstones that Thomas Moran, years ago, named the Temple of Set, and even further on, where we used to leave the horses and climb down a boulder, and up the face of the cliff, and down the rope ladder over the archaean rocks—here a crystalline mica schist—and so on, all the way to the river. So another day passes, and we stretch out our blankets, and sleep on the very ledge on which we bunked years and years ago, when we made our first descent and camp in this canyon.

Red Canyon Trail. The next day we are ready to continue on to the west. We climb out of Hance Canyon, and cross the ridge into Mineral Canyon, ascend again, cross another ridge, and find ourselves in that wonderland of the geologist, the Red Canyon Trail.

What do I mean by the Wonderland of the Geologist? Ask of these tilted strata of red rock, that give the canyon its name, that the men wise in rocks call the non-conformable Algonkian strata! Ask of the folds, or, flexures, in the strata, which the untrained eye can readily discern!

The Algonkian. This is one of the spots that all geologists—from every part of the civilized world—aim for. They know it is one of the rare things of the known world, and they come here to see it. So make yourself as wise as you can while you are here and have the chance. Read Dr. Walcott's monograph from the fourteenth report of the United States Geological Survey, Volume No. 2, entitled "Pre-Cambrian Igneous Rocks of the Unkar Terrane." Then read Major Powell's luminous earlier descriptions of these rocks in his "Explorations of the Colorado River of the West." Learn from their

own words what these geological masters say of these wonderful five hundred feet thick remnants of twelve thousand feet of strata that were once piled here above the archaean rocks. Imagine over two miles of strata thrust up into the air, and then pay strict attention as the scientists reason out their conclusions as to the how, why, where, and whence of the eleven thousand five hundred feet of washed away strata.

Asbestos Mines. If your guide knows how to compass it, cross the river here at the foot of the Red Canyon Trail, and visit the asbestos mines of the Hance Asbestos Mining Company of New York. Try to comprehend what asbestos is; how it is formed. See where it is located in these much burnt and much twisted strata.

If possible, go up and down the river, and see where the Inner Gorge—the granite or gneiss—really begins. It is not so very far away.

Then, when you are ready, watch the guide adjust the much-lightened pack, for the supply of "grub" is getting low; perhaps assist him swing the packs on the packsaddle, put on the canvas covering and throw the "diamond hitch," and then saddle your own horse—for by now you will have begun to feel some confidence and pride in doing things that the "tenderfoot" generally leaves to the guide—and soon you are climbing up the trail on your way to the rim. As soon as you are on "top," you "push on" the pack animals and "hit the trail hard" by way of Hance's Ranch, now owned by Martin Buggel, to Grand View, and over the familiar road back to El Tovar.

Eastern Points. Or, before returning, one day or several more days can be spent in visiting the salient promontories—Moran, Zuni, Papago, Pinal and Lipan Points—and then descending the most eastern trail of the Grand Canyon, known as the Tanner-French Trail.

Imagine the gain after such a trip. Count up the store of knowledge acquired; the health, vim, vigor added to one's store; the capacity for energetic life developed; the experiences accumulated; the hardships laughed at and overcome; and then tell me whether any similar outlay of cash elsewhere can produce equal benefits in results.

This is but one of many such trips which I will now briefly and succinctly name, each one of which is different from every other one.

To Havasu Canyon. One, two, or three weeks (or more) can profitably be spent in going westward (twenty-five miles) over the Topocobya Road to the head of the Topocobya Trail into Havasu (Cataract) Canyon. This is a drive of forty miles. Camp over night there, and then descend in the cool of the morning down either arm of this stupendous cliff (see chapter on Havasu Canyon) to Topocobya Spring, and on down the wash into Havasu Canyon, fifteen miles or so to the Havasupai village.

Camp near, or in, one of the fields of the Indians, where good alfalfa can be purchased for the animals and fresh vegetables and fruit (in season) for one's own use. If you are not too squeamish to see aboriginal man in his primitive dirt, study him in his home. Try to learn to look at things from his standpoint. If possible, witness one of his dances—a religious ceremony—and arrange to enter his primitive toholwoh or sweat-house, where he will give you a most effective and powerful Russo-Turkish bath. Swim in Havasu Creek to your heart's content, several times a day. Climb to the old fort, where the Havasupais used to retire to defend themselves when pressed too closely by their hereditary foes, the Apaches. Listen to the stones, the legends, the myths about the stone figures your eye cannot fail to see soon after you reach the village, which command the widest part of the Canyon, where the Indians live, and which are called by them Hue-puk-eh-eh and Hue-gli-i-wa. Get one of the storytellers to recite to you the deeds of Tochopa, their good god, and Hokomata, their bad god, and ask them for the wonderfully fascinating legend of the mother of their tribe—the daughter of Tochopa, from whom the whole human race descended. Ask one of the old men to tell you the stories of some of their conflicts with the Apaches, and why Tochopa placed the Hue-gli-i-wa in so prominent and salient a position. If you desire something of a different nature, engage some of the younger men to get up a horse race. The wise and judicious expenditure of a few dollars will generally produce the desired effect.

Then, when you are ready to travel again, get a Havasupai to guide you—no one else can—up to the fascinating spring called Pack-a-tha-true-ye-ba, or to some of their side canyons where cliff-dwellings, corn-storage houses and pictographs abound.

Bridal Veil Falls. On your return, descend to Bridal Veil Falls, and see where a capitalist spent many thousands of dollars in unnecessary work because he had been deluded into the belief that platinum existed here. Then forget men and their mad search for gold, and stand reverent before a secret shrine of beauty incomparable—this exquisite fall in its majestic setting. A day or more can be well spent here, and yet not exhaust the delight of this one fall. There are four ways of approach to it from the village

above. Go over them all, as each has its own peculiar charm. Then strike off down the Canyon to Mooney Falls, and hear the story, as you cross and recross Havasu Creek, of the poor miner who was killed here and from whom the fall obtains its name. And finally, follow the winding of the pellucid stream until it is ejected through a narrow passageway into the turbulent Colorado.

Cushing's Story of the Havasupais. On returning from the Havasupai village, come out by the Wallapai Trail or ascend the steep cleft of the Hopi Trail. Both ought to be seen and gone over, in order to know something of the engineering skill of these Blue Water Indians. And if you can get hold of it, read Frank Hamilton Cushing's delightful account (in Volume 50 of the Atlantic Monthly) of his trip from Zuni and down the Hopi Trail to the village you have just left. Also, if you care to read more ancient history still, get Lieutenant Ives's fascinating report of his trip into this Canyon (published by the War Department) and, even earlier still, the diary of Padre Garces (see chapter on Garces), the man who camped with the ancestors of these hospitable Indians, while Jefferson, Adams, Washington and Hancock were defying the British and preparing to launch the Declaration of Independence.

To Powell Plateau and Point Sublime. Another two or three weeks' delightful experience can be gained by arranging to go down Bass's Trail, cross on his cable ferry, go up the Shinumo Trail to Powell Plateau, watch the herds of protected and preserved deer and antelope, look longingly upon the succulent and delicious pine-hens that live upon pinion nuts and roost in the branches of the pine trees of the Kaibab forest, and pleasantly saunter along out to Point Sublime. The guide will point out to you —or he is no guide—the spot where in 1873 Thomas Moran sat with Major Powell, and afterwards painted the memorable canvas of the Grand Canyon which now hangs in the Capitol at Washington. Sleep out on Point Sublime and remember Dutton, whose beautifully polished descriptions of the Canyon, written here, have thrilled thousands of civilized and cultured people. Then push on west to the Greenland Spring, over Walhalla Plateau to Naji Point, whence you can look down into Chuar Creek, where Dr. Walcott, with three Mormons, spent a snowy winter studying the Algonkian strata.

An Adventurous Trip. Or, better still, if you are ready for whatever adventure may befall on a seldom used trail, descend Dr. Walcott's old trail to the river, and there build a raft (it is perfectly feasible and not too dangerous, unless the river be at the flood) and cross to the other side, letting your horses swim over. Then come out by way of the Tanner Trail, after riding up and down the wide beach and sandy stretches of this part of the Canyon as far north and east as the Little Colorado.

Indeed you may walk up the boxed-in canyon of this side gorge—where few white men have trod—on your return.

Qver the Desert to Hopiland. A fascinating trip, not however connected with the Canyon, is suggested in the chapter on "An Historical Trail across the Grand Canyon Country." Arrange to go in mid-August, even though it be hot weather, if you have grown a little toughened, for then you will reach Hopiland at the time of the Snake Dance, which thrilling ceremony I have briefly, but truthfully, described in a special chapter.

Many such trips can be planned for those who really wish them, and he who is wise enough to take them will probably improve in health, gain a wonderful knowledge of one of the most fascinating regions of the earth, and fill the memory with treasures that nothing can destroy.

CHAPTER VIII. From El Tovar Down The Bright Angel Trail

The Start. Leaving El Tovar promptly at 8:30 A. M., fortified with a good breakfast, and suitably clothed, the trail party in a few minutes reaches the head of Bright Angel Trail near Bright Angel Camp. For three-quarters of a mile this trail descends, zigzagging back and forth until the top of the cross-bedded sandstone is reached.

Faulting in the Sandstones. Here the visitor should not fail to observe the faulting in the sandstone, there being a difference in the two sides of about two hundred feet. Without this fault there would have been no trail, for to the lifting up, or dropping down of the strata, is due their shattered condition, which alone makes trail-building possible. When about a mile down, the separation line between the cross-bedded sandstone and the upper red sandstone is clearly revealed to the left of the trail.

By this time all timidity has vanished, and you implicitly trust both mule and trail, even when going around that narrow ledge known as Cape Horn.

Now, immediately before us, the majestic pile known as the Battleship presents itself with new power. The ship itself is composed of the red sandstone. The base upon which it rests is the red-wall limestone.

A few feet further, and the cross-bedded sandstone may be seen far below on the right, out of plumb with the same mass on the left, to which it belongs, clearly showing that some convulsion of nature has either thrust the mass on the left up, or forced the mass on the right down.

From this spot a fine view is had of the red-wall limestone below and the Indian Garden; and, far below, at the end of Pipe Creek, the peculiar folding of the Algonkian strata. This folding is also to be seen on the other side of the river in the same rocks.

Trees, Flowers and Birds. While descending the first mile of trail, one sees plenty of flowers and shrubs, and many Douglas spruces. These do not exist on the rim, and, strange to say, the pines which abound there are never found on the trail. One will generally hear the sweet descending "pipe" of the canyon wren, and the harsh scolding of the blue-winged pinion jay. Hawks, owls, mocking-birds and robins are often seen. Butterflies, moths, and humming-birds wing their way to and fro and give a delicate touch of life to the stern rocky features. Time was when the visitor at El Tovar who went down the trail to the river might have seen mountain sheep, bear, deer, antelopes and coyotes.

Jacob's Ladder. When the "blue lime"—the top of the red-wall limestone—is reached, one may study a fine piece of real canyon trail-making, locally called Jacob's Ladder. Here steps have been cut in the slippery and solid rocks, in some places built up with timbers, and thus made perfectly safe. It is customary for everybody to dismount here, so as to lighten the load. The well-trained saddle mules of El Tovar stables go up and down this part of the trail without hesitation.

Red-Wall Limestone. Standing on the summit of the red-wall limestone, we are again forcefully reminded that it is the most prominent member of the Grand Canyon strata. Its insistent mass is a thousand feet in thickness. The face of this wall, close before us, is carved into numerous alcoves, and as we near its base, we observe to the right a vast double-cornered recess known as Angel Alcove. From here it is interesting to look up to the rim and observe the peculiar and varied contour of the many pinnacles cut by wind and storm out of the cherty limestone.

Buddha and Manu Temples. From this point, also, the first good view, from below the rim, of Buddha Temple (seven thousand two hundred and eighteen feet) is obtained. It is to the left of Bright Angel Creek. Now look carefully at the ridge that leads the eye from Buddha Temple to Bright Angel Creek. It appears to be a portion of the main wall of the Kaibab Plateau. In reality it is three miles from the Kaibab wall, and, under suitable conditions, may be seen as a massive temple, which has been named Manu Temple (seven thousand one hundred and ninety-two feet), after the great law-giver of the Hindoos.

Indian Garden and Cheops Pyramid. At the base of the red-wall limestone, the trail opens up a little, and permits easier breathing by the tyro on horseback; from now on to Indian Garden (three thousand eight hundred and seventy-six feet) we ride in a boulder bed, where large blocks of rock of every conceivable shape lie as they fell from the strata above. Small shrubs and plants abound, and tiny lizards and inquisitive swifts dart to and fro. Nearer to us is Cheops Pyramid (five thousand three hundred and fifty feet), a massive monument, though less ornately carved than Buddha.

Isis and Shiva Temples. Above it and farther to the left, is Isis Temple (seven thousand and twenty-eight feet), the cap of which, at this angle, presents the appearance of two acorn-like structures resting upon their cups, the taller of which is carved out of the cross-bedded sandstone. It is the eastern supporter of Shiva Temple (seven thousand six hundred and fifty feet), of which Captain Dutton, who named it, wrote eloquently and vividly.

Brahma and Zoroaster Temples. Now turn the eye away from Shiva, across to the east of Bright Angel Creek. There, outlined against the sky, are two noble-profiled buttes. The rear one is Brahma Temple (seven thousand five hundred and fifty-four feet), named after the first of the Hindoo triad, the Supreme Creator. The smaller butte, an angular mass of solid, unrelieved rock, sloping in a peculiarly oblique fashion, is Zoroaster Temple (seven thousand one hundred and thirty feet), thus adding to the Hindoo pantheon a fane for the founder of the religion of the Irano-Persians.

Deva Temple, Obi, and Komo Points. Behind Brahma can be seen, when at the right angle, a flat-topped detached mass (seven thousand three hundred and forty-four feet) named Deva Temple. Behind and above it are two points, Obi (eight thousand feet) to the right, and Komo, about the same height, to the left. These are the salient points on Walhalla Plateau, overlooking the Ottoman Amphitheatre, the chief temples of which I have already named.

Indian Garden. Passing now through the fertile Indian Garden, Angel Plateau is reached. The spring at Indian Garden is large enough to irrigate a small tract of ground. Experience has demonstrated that not only can vegetables of every kind be grown here, but all kinds of fruits, even oranges, lemons and grapefruit. For two miles after leaving the Garden, we ride over a fairly level plateau to its edge, where

it overlooks the Granite Gorge. Here, standing on the Tonto sandstone (three thousand seven hundred and eight feet), we look down into the dark recesses of the inner gorge, and picture the events described by Major Powell, when he and his brave band of intrepid explorers passed through.

O'Neill Butte. Now looking back to the rim at Yaki Point, we see beneath it, and corresponding to the Battleship, an imposing structure. It has been named O'Neill Butte, in honor of "Bucky" O'Neill, one of Roosevelt's Rough Riders, who was slain during the heroic charge at San Juan Hill. He it was who interested Eastern capitalists in the Anita Mine, and was therefore indirectly responsible for the building of the Grand Canyon Railway.

Pipe Creek. Those who wish to go to the river now retrace a portion of the way to the Indian Garden, and then turn off eastward by the old-time Indian corn-storage houses. Here one obtains a fine view of the wild chaos of metamorphosed rocks of Pipe Creek. It is a veritable Pluto's workshop, where the rocks are twisted, burned, and tortured out of all semblance to their original condition. They are made into cruel and black jagged ridges, which seem eager to tear and rend you.

Falls of Willow Creek. In these forbidding rocks the Devil's Corkscrew Trail has been cut, winding and twisting down, down, twelve hundred feet, passing by a split in the rocks where the waters of Willow Creek make a waterfall of over two hundred feet.

The Colorado River. At last the Colorado River is reached, and we are but two thousand four hundred and thirty-six feet above the sea. El Tovar, above, is six thousand eight hundred and sixty-six feet, and we have thus descended four thousand four hundred and thirty feet, nearly a mile, from rim to river. And what a river it is! No one can form any idea of it, unless he stands on the very brink, almost deafened by the sound of its sullen roar and turbulent rapids. It is hungry, insatiable, murderous, cruel. Many a foolish mortal has had the breath dashed from his body by these powerful waves. Those who wish to cross to the other side can defy danger in the cable crossing, but only a skilled boatman should attempt to row across.

Colorado Salmon. Fish are caught in the river here at times. The chief variety is a scale-bearing fish, of silvery appearance, commonly known to the local dwellers as Colorado salmon. Specimens have been caught two feet eight inches in length, and sixteen inches in circumference, and a fortunate fisherman brought one up to El Tovar, which was nearly three feet in length.

Camping at the River. It is a delightful experience to remain over night and sleep on the river sand, especially if the moon be at its full. Then one sees great walking shadows—moving, living, palpable entities. Towers and buttes and temples take on new qualities under the softer luminary of the night.

Here, too, one gets to know the Canyon in a new phase. He is in the trough between two ranges of mountains. To the north and to the south are towering peaks. You forget that you have ridden down, down, to reach this spot. You are in a new country. A majestic range of glorious peaks soars away above you to the north. Now, by merely turning in the other direction, you see another and entirely different range, with peaks, canyons, ravines, gorges, points, ridges all its own.

The Return to El Tovar. Riding back to El Tovar, with thoughts like these, the visitor imagines himself riding to a City Celestial. He reaches the plateau, studies for a while the unique coloring of the Algonkian strata just above the Granite Gorge, and sees where the faulting has raised them above the Tonto sandstones. Then, steadily looking upward, he rides forward, climbing slowly but surely to the peaks above. Tired though he is, he feels a constant thrill of satisfaction as he rises higher and higher, and when, at last, his animal lifts him to the level of El Tovar, and he stands once more in his room at the hotel, he feels an exaltation vouchsafed only to those who have dared and done an unusual thing. And this the Canyon is! No matter how often the trip is made, the interest of it never tires; the wonder of it never grows less.

CHAPTER IX. To Grand View And Down The Grand View Trail

To Grand View. One may go by regular stages or by private conveyance from El Tovar to Grand View. The distance to the hotel is fourteen miles. The drive is through the glens and winding roads of the Coconino Forest, with junipers, pines, sage-brush, atriplex and the beautifully flowered Cowania Mexicana, or mountain mahogany, commonly known as the quinine tree, abounding on every hand. Though comparatively close to the Canyon, one seldom catches a glimpse of it, for the country slopes away from the rim. The ride is through a thickly forested region of giant pines.

Varieties of Flowers and Shrubs. During the season of flowers one will be surprised at the great diversity presented. There are varieties of artemisia or sage-brush, antennaria, columbine, the

barberry, spiraea, Russian thistle, eriophyllous, chrysothamnus, plantago, dandelions, lepidium, chaenactic, linum, hosackia, cirsium, astragulus, ambrosia, euphorbia, pleustemon, achillea millefolium, erodium, or stork's bill, orthocarpous, vilia, solidago, lactuca, helianthus, erigeron, brickellia, malvastrum, ptelea or a desert hop-tree, polygonum, sphedra, lupines, castilleia, lathyrus, verbena and a score of others. I merely name those I saw on one day's drive to and from Grand View, so that the botanist, amateur or professional, may know the rich treat there is in store for him. For, under the peculiar climatic conditions here, many of these more common plants present singular variations.

When about half the distance is passed, the road enters Long Jim Canyon, so named after a well-known sheepherder of the early days who used to wander here with his sheep.

Pompey's Pillar and Thor's Hammer. Shortly before reaching Grand View Point, the road passes not far from the rim, where it curves into a small amphitheatre in which are two striking columns of erosion, Pompey's Pillar and Thor's Hammer.

Grand View Hotel. Grand View Hotel is directly upon the rim, and commands a fine outlook over the open portion of the Canyon at its very beginning. The hotel was built by and is under the management of P. D. Berry, whose homestead is near by. Mr. Berry was one of the discoverers of the mine below and one of the locators of the Grand View Trail.

Grand View Point. Grand View Point (elevation seven thousand four hundred and ninety-five feet) is about a mile from the hotel. It affords the most extensive view possible of this part of the Canyon. The highest point, too, is at the eastern end of the Canyon, being two hundred and eleven feet higher than Zuni Point (seven thousand one hundred and fifty-seven feet), one hundred and twenty-five feet higher than Pinal Point (seven thousand three hundred and seventy feet), and thirty feet higher than Navaho Point, all of them salient points to the east.

Cliff Dwellings. There are a number of cliff dwellings in this vicinity, which take from half a day to a day to visit. The best preserved of these are in the gulches of the Coconino Forest, on the rocks of which are also some interesting pictographs. There are remains of dwellings on Moran's Point, and at various places along the rim of the Canyon. A few miles to the east of Grand View Point is the junction of the Little Colorado with the Colorado River, as it flows out of the Marble Canyon into the Grand Canyon. Here, for nearly a score of miles, the strata have been shattered and carried away, so that the Canyon is opened up, as it were, more than in any other place. A vast number of pillars of erosion stand revealed in wonderful variety.

It should never be forgotten that the Canyon is so diversified that each point and each trail has its own distinctive charms, and he is wise, in the Canyon study, who sees it from as many points of vantage as he can.

The trip from Grand View Hotel to the plateau overlooking the Granite Gorge, three thousand five hundred feet below, and return, is made in one day. The old Grand View Trail leaves the rim about a mile from the hotel, winding its way down from one stratum to another, around points which command extensive outlooks.

Grand View Trail. A new trail from Grand View Point, one and a half miles north of the hotel, joins the old trail about a thousand feet below the rim, and continues to the top of what is locally known as the "blue limestone," two thousand five hundred feet below the rim, to the Horseshoe Mesa, where the Canyon Copper Company mine is located. Here also are the bunk-houses and boarding-houses of the miners, the corral for the burros used in packing ore to the surface, and several small sleeping cottages for travelers. The distance from the rim to the camp is three miles on the old trail, and about half a mile less by the new trail. To the mouth of the mine is another half mile. The trail was begun in June, 1892, and the first ore pack-train went over it in February, 1893. In 1901 the interests of Berry and his partners were bought by the Canyon Copper Company. The distinctive charm of the Grand View Trail is the wide and unobstructed outlook which one gets here nearly all the way down. It is not boxed in.

Horseshoe Mesa. The start from Grand View Hotel is generally made after lunch, so that one arrives at the camp of the Canyon Copper Company in time for supper, and lodges there over night. After supper, a visit is made to the edge of the Horseshoe Mesa for the sunset view. This is one of the more extended views afforded only from such a mesa or plateau thrust well out into the heart of the Canyon. Up, down, and around, there is scenic attraction. The river flows on in the deep Granite Gorge below. The best time, too, for seeing and knowing the Canyon is at the sunset (or sunrise) hour. Then the shadows are long, and the various objects stand out distinctly.

Grand View Caves. The following morning a visit may be made to the limestone caves or the Copper Company's mine. The former were discovered in 1897 by the camp cook, Joseph Gildner, and are well worthy an extended visit. The first cave is some three hundred feet long, and varies in height from ten

to eighty or ninety feet. The second cave has about the same length, but is much higher and contains a far more diversified collection of stalactites, stalagmites and sheets of calcareous deposits, that hang like curtains before the more solid side walls. While appearing in the red-wall limestone, the rock of these caves is all of a creamy white, thus demonstrating that the formation itself is white, but that the exposed walls are stained by the red washed over them from the strata above.

Copper Mine. The mine is equally interesting, and to those who have never seen the operations of tunneling, stouping, driving shafts, winzes and the like, and the removal of the ore, it is an experience well worth while. (At this writing the mine is temporarily closed.)

A Fine Trip. From the Horseshoe Mesa, one may descend to the Lower Plateau on horseback, and then to the river on foot. Those who wish a more extended trip should ride from the camp, across the old Hance and Mineral Canyons into Red Canyon, stay over night at the river, at the foot of the Red Canyon Trail, and then return up the latter trail to the hotel. The trail is fairly good, and the three different side canyons traversed reveal a wonderful variety of rock scenery.

To Hance Canyon. To take this trip, the trail passes the mine, eastward, down a steep break in the red-wall limestone, zigzagging back and forth. Passing under overhanging cliffs, it leads down until the plateau is reached, where twenty years ago I saw bands of mountain sheep. From this plateau, the descent is steep into Hance Canyon, and the student of the dynamic forces of nature can here see (when about half-way down) a wonderful example of the shattering of the earth's crust. Here the immense mass of the "red-wall" has been shaken up, and is now rapidly disintegrating, to be washed down by the storms of succeeding years into the great river which will ultimately deposit it in the Gulf of California.

By and by Vishnu Temple, the grandest of the rocky structures, comes into sight, and a little further on one can see, at the base of Vishnu, and above the granite, the red tilted strata of the Algonkian.

The descent into Hance Canyon reveals a fine view of Ayer Peak, and as we look down we can see the peculiar shattering of the Tonto sandstones that Thomas Moran named the Temple of Set. It takes but a few minutes to ride or walk down to the temple, which is one of the distinctive features of the Hance Trail, down which most of the early visitors to the Canyon used to come.

Angel Gate. The ascent is now made on the eastern side of Hance Canyon, to the summit of the Tonto sandstones, and from this point a fine view of Angel Gate is to be had, its rich reds contrasting agreeably with the grays and olives of the Tonto series.

Mineral and Red Canyons. On the plateaus separating Hance Canyon from Mineral Canyon, and the latter from Red Canyon, one can see the rare Algonkian strata to fine advantage. Numerous faultings and flexurings may be observed, and on the last mile before reaching the foot of Red Canyon, the trail leads through a great boulder bed along the brink of the gorge immediately overhanging the river. Camp is made here at night.

The return ride up the Red Canyon Trail is made enjoyable by the brilliant colorings, the faultings and nonconformities of the strata, which are apparent even to the most undiscerning layman. Here the conglomerate appears above the blue limestone, while ordinarily it is found below it. The Algonkian also is largely in evidence. Across the river one may see the location of the asbestos deposits.

Moran Point. Grand View Point and the points east are all reached from the Grand View Hotel. The first of these is Moran Point, seven thousand one hundred and fifty-seven feet elevation, five miles east. The trip may be made in a vehicle, over a road from which the Canyon is not visible until the point is reached; or in the saddle, over a trail, the last two miles of which are along the rim. This is a unique trail, from the fact that it overlooks Hance Creek, and further along, gives commanding outlooks down Red Canyon.

Zuni Point. From Zuni Point, two miles further east, a still more extensive view is obtained. The trip to these two points may be made in half a day, but many prefer to give a full day.

Navaho Point and Desert View. Ten miles from Grand View is Navaho Point, over seven thousand feet elevation. The ride thither, after leaving Zuni Point, is through the Coconino Forest, without a trail. It is necessarily a saddle trip. The outlook is especially attractive, as it presents portions of the Painted Desert and the mouth of Marble Canyon.

Comanche Point, seven thousand and seventy-nine feet, and Cape Solitude, six thousand one hundred and fifty-seven feet, are respectively about seventeen and twenty miles east of Grand View, and may be visited in the saddle during a camping-out trip of two days. They both command views of the amphitheatre where the Colorado River makes an almost right angle curve from Marble Canyon into the Granite Gorge. The walls are precipitous to three thousand five hundred feet below, and the outlook

afforded is about seventy miles in either direction, up and down the Canyon. In addition to the Canyon outlook, Cape Solitude, which might well be called Desert View, commands a fine expanse of the Painted Desert, extending a hundred miles in either direction, the colorings of which are especially dazzling at sunset. The Little Colorado River flows through this desert, one thousand five hundred feet below Cape Solitude, in a gorge of about two thousand five hundred feet in depth. From the narrow canyon of the Little Colorado, the desert rises to the east in three successive, gigantic steps of about one thousand feet each. This affords a panorama of glorious colorings at sunset, while the view in the opposite direction glows best in the early hours of dawn.

To those who wish to camp out, sleeping in the open for two or more nights, the trip may be extended to the Canyon of the Little Colorado. In this excursion, one gets a fine breath of the desert, a sight of the narrow and boxed-in Little Colorado Canyon, and extended desert views, passing by Cedar Mountain, one of the few spots where fragments of the almost vanished strata of the Permian age are still visible.

Tuba City and Moenkopi. Tuba City, sixty miles east of Grand View Hotel (a four days' saddle and camping-out trip), is situated in the Painted Desert, and is the headquarters of the Navaho Indians of this locality. Here also is located the United States Government Indian School, where the children of several tribes are being civilized. Two miles away is Moenkopi, a Hopi village, or pueblo, of some thirty homes, where this pastoral and home-loving people may be found engaged in their quiet agricultural pursuits, the women also busy at basket-making and the fashioning of pottery. At Tuba City there are many Navahos living in their hogans, where the rude silversmiths are at work creating their "arts and crafts" ware, and the looms of the blanket-weavers are incessantly busy.

Crater Mountain. Crater Mountain, thirty-nine miles south of Grand View Hotel, is an extinct volcano with one side eroded, leaving a sheer wall five hundred feet high in circular form, with a variety of pillars standing high above the bottom of the amphitheatre. Its red, yellow and black colors combine in a peculiar harmony, and novel effects are witnessed at sunset, or by moonlight. To enjoy this trip aright, one should drive there, and arrange to sleep in the amphitheatre, returning on the following day.

Extinct Volcanoes. Or, if a more extended trip is desired, one can drive on to the many cinder cones and extinct volcanoes that lie to the north and east of the San Francisco Mountains, including Sunset Crater and O'Leary Peak, and then into Flagstaff.

CHAPTER X. A New "Rim" Road And Trail Into The Scenic Heart Of The Canyon

Large corporate bodies do not always move with the same rapidity as do personal enterprises where one man controls. Many minds and many interests often have to be consulted. When, however, the way is clear, a corporate body, with its vast power, can accomplish in a short time what individuals could never compass in several successive lifetimes.

These remarks are exemplified in the action of the Santa Fe Railway Company at the Grand Canyon. It has taken several years for things to properly shape themselves for adequate development, so that all classes of travelers visiting the Grand Canyon could be suitably provided for. In hotel accommodations, El Tovar, and the equally well conducted but cheaper Bright Angel Camp, leave nothing to be desired. In transportation facilities, both on the railway and for drives, riding or the descent of the trails, provision is made to meet the most exacting demands.

Hermit Rim Road and Trail. These imperative necessities met, attention has been given to a further opening up of the scenic portions of the Canyon. In furtherance of this policy the Santa Fe Railway has built a new roadway from El Tovar and Hopi Point along the south rim of the Canyon to the head of Hermit Trail, nine miles west of El Tovar. It is called Hermit Rim Road.

This roadway is thirty feet in width, with a central driveway, fourteen feet wide, of crushed stone rolled hard and sprinkled with crude oil. It is so wide, so well macadamized, so level and so dustless that it may well be likened to a city boulevard in the wilderness.

The road ends at the head of Hermit Trail, a new pathway now being built down the south wall of the Canyon. Though this trail is being completed, it will not be opened for regular trail service until the summer of 1912. It leads down into the very heart of the Canyon and reveals innumerable scenic wonders and surprises.

Hermit Rim Road to Hermit Basin. Hermit Rim Road closely follows the rim from Hopi Point to the head of Hermit Basin and the top of Hermit Trail, —not too near the brink, but in and out among the

trees, affording wonderful vistas of the Canyon and the cliffs of the opposite wall. Hermit Rim Road is perhaps the most unique highway in the world, for there is no other roadway on the brink of such a tremendous gorge. Startling views reveal depths of the Canyon on one side, and on the other are quiet scenes down long forest lanes. In places there is a sheer drop of 2,000 feet within a rod of the traveled track, and another drop almost as far below that, but there is no danger, so perfectly have the engineers of the road done their work.

Leaving El Tovar, the road quickly ascends El Tovar Hill, giving a view of the San Francisco Peaks and neighboring mountains standing high above the Tusayan Forest, and purple colored with the haze of seventy-five miles of distance. Then, down into Coconino Wash, up Tusayan Hill, past Maricopa Point, and Hopi Point, long noted for its unrivaled sunset view, is reached.

About a mile beyond Hopi Point is Mohave Point, standing in sheer and awful precipices above Monument Creek, and leaving that, a huge curve on top of Hopi Wall is traversed, and opposite this place the granite gorge is deepest.

Rounding Mohave Point on the next leg of the journey three and four-fifths miles to Pima Point, is the greatest curve on the road, and along this section there is much to claim the attention. First one and then another of the great interior rock temples seems to command the eye; the side canyons reaching far back into the Kaibab Plateau on the north, and that everywhere enter the main gorge, show depths of startling distance; the predominant colors—vermilion, blue, green, buff, and gray—are incomparable; and the wild river, roaring and tumbling, may be seen from different points, though from the roadway it seems but a mere ribbon of brown. At Pima Point the road curves to the southwest and continues for more than a mile on the rim of Hermit Basin, until the head of Hermit Trail is reached. Wide outlooks across the Cataract Canyon country and unusual views of the river are afforded on the final mile. The road ends where Hermit Trail, a new trail, like the road, wide and safe, begins.

Hermit Trail. The new trail is being built on the most approved engineering lines. It is four feet wide all the way, with a low protecting wall of rock on the outside, and is most carefully laid out. Cuts in the solid rock, likewise heavy stone walls built up as a support, are used wherever necessary for greater safety. It descends by easy grades and long zigzags for nearly five hundred feet to the top of the red limestone, where from wide shelves views may be obtained safely of the narrow cleft far down in which Hermit Creek flows. Further descent is made by easy steps to a level stratum, which is traversed by the trail on its way to the river; and the Canyon on either hand seems rapidly to open out, revealing wonders of scenic beauty. The northern extremity of the red sandstone under Pima Point is thus reached and on both sides of the river such a stupendous panorama is at once opened up that even superlatives cannot describe it. Under Yuma Point, on the left, an ornately sculptured butte, already seized by Moran, Leigh and other discerning artists as a piece de resistance, compels the eye.

On this point one may linger for hours, if time permits, and as the changing lights bring into prominence different mural features, or the moving clouds cast their revealing shadows on first one, then another, of the temples and towers, the reverent beholder feels that he is on holy ground. It is indeed superlative in color, in shadow, in form, in majesty, in variety and in general effect.

On the Plateau. The trail from this point descends to the plateau and continues to the river. A rest house is to be established providing ample accommodations both for eating and sleeping. This will be the first provision near the river for all travelers,—those who wish hotel luxuries and comforts as well as those who desire the experience of camp equipment.

All the way down, the strong scenic features of the Canyon remain in evidence, and the depths traversed by the trail but enhance their glory and beauty, as their outlines are projected against the perfect turquoise of the Arizona sky. Before returning to the rim one may wish to take advantage of the opportunity to spend some hours exploring for himself the foot of the greatwalls near by, or studying the geological formations.

Mountain Sheep. Perchance, also, one may see a band of mountain sheep, for now that they are so strictly preserved, a heavy penalty being exacted both by the state and federal governments for killing one, they are increasing in numbers. One of their usual haunts for years has been in the canyons and ravines north of Shiva Temple. It is not unreasonable to anticipate that they will often roam into view of visitors so near by on the other side of the river.

Hermit Trail Loop. On the return journey, provision is to be made for a choice of several routes, viz: up the Boucher Trail, which is on the other side of Hermit Basin; along the Tonto Trail just above the river, westward to Bass's and up the Bass Trail; or eastward to the Indian Garden, and up the Bright Angel Trail which route is known as the Hermit Trail Loop.

Bass Station and Bright Angel Wash. Leaving El Tovar (elevation six thousand eight hundred and sixty-six feet), the road winds for over, five miles through the Coconino Forest, mainly following the railway track until Bass Station appears (elevation six thousand four hundred and seventeen feet). The road now enters a narrow defile known as the Bright Angel Wash, giving one a fine opportunity to learn the singular drainage system of the Canyon plateau, which, as has been explained elsewhere, is away from the Canyon for many miles. The Wash is picturesque and rugged, the side walls occasionally appearing as bare masses of rock, and again covered with fertile soil on which grow great pines, also ferns, mosses and flowers. The road is fairly easy, and the horses travel well. Six and a half miles away, the Coconino (Kohonino) Wash is passed on the left. A little further on, the Canyon widens somewhat, and a rude meadow, occasionally filled with rich and luscious natural grass, is crossed, after which the road makes a slight ascent to the plateau, and more open country is reached.

Over the Plateau. From this point, the ride is diversified. There are no steep hills, but the road aims directly for its objective point, taking the visitor through growths of pinion,—from which the Indians gather the delicious pine nuts,—juniper,—from the crushed berries of which they make a sweet and refreshing drink,—and over levels where rich grama grass grows side by side with the cactus, the amole and the yucca, brightened and vivified by the Indian paintbrush, sunflowers, lupines and scores of other gorgeously colored flowers.

Midway between Bass Station and Bass Camp, ten miles each way, the road passes a United States Geological Survey monument, which records the fact that here the plateau is six thousand three hundred and seventy-two feet above sea level.

The Surrounding Mountains. On the journey, glimpses are had of the San Francisco peaks, and Mounts Sitgreaves, Kendricks, and Floyd, while, in the far-away west and south, the blue ridges of the plateau, descending to the lower levels, are clearly discernible. To the north and west, Mounts Emma and Trumbull and other peaks of the Uinkarets appear like deep blue clouds on the horizon. They lie on the further side of the Canyon, and are seen more distinctly from Bass Camp.

Hotouta Amphitheatre. When fifteen miles from El Tovar, the first gaze into the Canyon is afforded at Hotouta Amphitheatre, a deep indentation in the walls of the south rim. The road here runs close to the rim. This amphitheatre receives its name from Hotouta, the son of Navaho, the last great Havasupai chief. Hotouta was an enlightened Indian, friendly to the better class of whites, clear-headed and honorable in his dealings with them.

The Cisterns. Thence to Bass Camp the drive is entirely through pinions and junipers. About a mile before the destination is reached, the road passes "The Cisterns," where the horses are watered.

Bass Camp. Bass Camp consists of one small central building, containing a dining-room, sitting-room, kitchen and several bedrooms. Around are tent-houses and tents for the further accommodation of guests, with stable and saddle-house, etc. Almost immediately in front of the main building the trail begins.

Powell Plateau and Dutton Point. Taking a seat at the head of the trail, let us now give our undivided attention to the scene spread out before us. The predominating feature is the great uplift of the opposite wall, and the aggressiveness of its salient promontory. Here is a break in the continuity of the wall of the Kaibab Plateau. This break affords an immediate view of the highest portions of the Canyon's walls. To the right of the break is the Kaibab Plateau, its highest portion being eight thousand three hundred feet above sea level. To the left is Powell Plateau, seven thousand six hundred and fifty feet elevation. The great point, nearest to us, was named Dutton Point, after the poet-geologist, whose monograph on the Canyon will ever be a memorial to his love of the place, his scientific accuracy of observation, and his poetic eloquence of description. It is between Kaibab and Powell Plateaus that Bass's Trail to Point Sublime climbs its circuitous and winding way,—this portion being called "The Saddle." The dark growths which crown the plateaus are in reality pine trees, which, on the north rim of the Canyon, attain immense size. They, and lesser tree growths, descend to the bottom of the second mass of talus.

The Rocks of the North Wall. The rock bands on the opposite walls, a large part of the way down, are like those found on the same north wall seen from El Tovar. First there is the band of cherty limestone, from which a sloped talus leads to the creamy sugary sandstone. Immediately below this begins the "red," which descends in strata of varying width and color down to a rather narrow-appearing slope of red talus, which leads the eye to the widest member of all the Grand Canyon strata. This is the so-called red-wall limestone. All these strata, from the rim down, are said to be in the Upper and Lower Carboniferous Systems.

Below this majestic wall appear the variegated strata of the Cambrian, in grays, buffs, olives, greens and yellows.

The Tilts. Now we see a large exposure of the nonconformable strata, which, on account of their very markedly tilted condition, have been named "The Tilts." Below this is found the Archaean rock.

It is hard for any but the well-trained observer to realize that practically the same conditions that exist on the north wall, exist on the south wall, directly under his feet, except that the Algonkian is absent. The talus shuts off the view, and it seems impossible that there can be such great precipice walls as the opposite mural face reveals. It is not as high, however, on this side as it is on the other, by fully one thousand six hundred and fifty feet. The difference is caused by the great upthrust in the earth's crust, which detached Powell's Plateau from the Kaibab Plateau.

One may approximately estimate the various strata of the wall of the Kaibab as follows:

Colorado River, say. . . 2400 feet above sea level
Archaean . . . . . 1000 " thick
Algonkian . . . . . 1100 " "
Cambrian . . . . . 1000 " "
Carboniferous . . . . . 2750 " "
———-
Total level above sea. . 8250

Bass Tomb or Holy Grail Temple. The great north wall is not featureless. There are a number of architectural forms, of wonderfully varied shape, resting upon bases of massive solidity. The most striking of these is a squarebased monumental mass,—Holy Grail Temple, formerly Bass Tomb,—on which rests a well-shaped pyramid, crowned with a red and white circular shaft. The whole butte is well proportioned, having a base of sixteen square miles, and rising to a height of six thousand seven hundred and ten feet.

King Arthur Castle. Slightly to the east of it is another majestic butte, inferior only in size. The crowning shaft is missing here, but a castellated structure of red rock suitably dominates it. It bears the name King Arthur Castle, and is seven thousand three hundred and fifteen feet elevation.

Guinevere Castle. Still further to the east a winding ridge of rock, standing over one of the many oblique gorges within the main gorge, leads up to a third dominating figure of rock sculpture. This is Guinevere Castle, seven thousand two hundred and fifty-five feet.

Huethawali. Now let the eye rest upon the objects immediately before it, and more in the center of the Canyon. The chief object is an almost detached mountain, crowned with irregular cross-bedded layers of white sandstone. The Indians call this mountain Hue-tha-wa-li, (the final "i" being pronounced as "e,") which signifies White Rock Mountain. This is now the name they give to Bass Camp, and the Havasupais at El Tovar, who are starting for their Canyon home, will often remark: "We go Huethawali tonight." Its elevation is six thousand two hundred and eighty feet.

Darwin Plateau. The main plateau before us is named Darwin Plateau, after the learned evolutionist. Take this plateau as a rude and misshapen hand, imagine the thumb and little finger gone, and it will be seen that the other three fingers radiate from Darwin Plateau in the shape of three irregularly contoured, but fairly level plateaus, Huethawali resting like a great wart upon the base of the middle one of the three. To these plateaus have been given the following names: the one to the right is Grand Scenic Divide, the middle one is named Huxley Terrace, and the one to the left (the west) is Spencer Terrace.

For a few moments let us look at each of these plateaus, and grasp such features as the eyes may observe.

Grand Scenic Divide and Dick Pillar. Grand Scenic Divide was so named because it is the point where the granite of the Inner Gorge disappears from the Grand Canyon, and this disappearance makes as vast and wonderful a difference in the Canyon scenery as it is possible to find in its whole two hundred and seventeen miles of length. To the right of the Divide, looking eastward, where the granite is still in evidence, one can see the temples, buttes and towers that make the view from El Tovar and Grand View Points so interesting. Looking westward, the whole aspect changes, so markedly, indeed, that one scarcely can believe it to be the same Canyon. Hence the appropriateness of the name. At the extreme end of this plateau, a detached rocky pillar stands peering down into the deepest recesses of the Inner Gorge. This bears the name Dick Pillar, from Robert Dick, the baker-geologist of Thurso, Scotland, who gave such material assistance to Hugh Miller in his studies of the Old Red Sandstone.

Huxley Terrace. Huxley Terrace is the center plateau. At its end is an eroded mass of red sandstone,

to which the name of the noted naturalist and evolutionist, Wallace, has been attached. Still nearer the end, and belonging to the marble wall, is a pagoda named Tyndall Dome.

Spencer Terrace. Spencer Terrace is the most western of the plateaus, and is where the Mystic Spring used to be, which for many years gave its name to Bass's Trail—the Mystic Spring Trail.

These three plateaus vary in width from a quarter of a mile to over a mile wide; they are dotted with what seem to be patches of grass, but which in reality are juniper and pinion trees from ten to forty feet in height.

Terraces of the Explorers. About a quarter of a mile to the west of Bass Camp is the amphitheatre in which my earlier book, "In and Around the Grand Canyon," and a large part of the present book were written. From this restful spot I have looked out thousands of times across the great bend of the river and Garnet Canyon to the five terraces named after the early-day Spanish explorers, Marcos, De Vaca, Tovar, Alarcon, and Garces.

Points of the Explorers. To the west stands out Chemehuevi Point, six thousand six hundred and twenty-six feet, while across the river, terminating Powell Plateau, are Wheeler Point, six thousand seven hundred and fifty feet, and just beyond it Ives Point, six thousand six hundred feet.

To the north of Ives Point, but hidden from view, are Beale Point, six thousand six hundred and ninety-five feet, Thompson Point, six thousand seven hundred and thirty feet, and Newberry Point, six thousand seven hundred and fifty feet, all named after early Arizona explorers and geologists.

Conquistadore Aisle and Steamboat Mountain. The dark chasm of the river itself, where it moves almost due west, has been named Conquistadore Aisle, in honor of the men whose names are attached to the terraces above. Here the river again curves, and its course is seen to be to the northeast, as if doubling behind Powell Plateau. It then turns back upon itself, and goes to the southwest. If the conditions are favorable, one may see, to the left of Ives Point, a majestic butte, detached from the further wall of the Canyon, and generally known as Steamboat Mountain. It is an object of great interest, when seen from the saddle on the north rim by those who have crossed the Canyon and are journeying to Point Sublime.

The Scenic Divide. Now let the observer compare the view to the left with that which he has carefully examined on the right. There, in the latter view, are towers and buttes, detached monuments, and a perfect bewilderment of scenic features; here, to the left, save for the aisles, terraces and further wall, there is little to attract attention. The view, comparatively, is uninteresting. The reason for this is clear. The granite of the Inner Gorge has disappeared. Here is the Scenic Divide, the natural line of demarcation between two distinctive portions of the Canyon, the scenery of which is markedly diverse. Where the granite is in evidence, the stratified rocks resting upon it are carved into varied forms: Where the river flows through the stratified rocks, and no granite appears, there are few or no buttes, no towers, no monuments. Nowhere else, in the accessible portions of the Canyon, is this difference seen, for at Grand View, the head of the old Hance Trail, the Red Canyon Trail, Boucher's and the Bright Angel Trails, the outlooks are over areas where the granite has thrust itself out of the bowels of the earth.

Bass's Cable Crossing. The ride down Bass's Trail is an interesting one, passing on the way two prehistoric water-pockets and several cliff-dwellings. On the plateau below, forty miles of trail riding, almost on the level, may be indulged in, before one descends the narrow Canyon to Bed Rock Camp and the river. Here a ferry and cable crossing have been established, the former for use during low water, while, after the flood season begins, the latter enables travelers and stock to make a safe passage in the cage suspended from the cable.

CHAPTER XII. Across The Grand Canyon To Point Sublime

Point Sublime. Point Sublime is one of the most important promontories on the north rim. It was here that the geologist-poet, Clarence Dutton, wrote many of his descriptions of Canyon scenery. He says: "The supreme views are to be obtained at the extremities of the long promontories, which jut out between the recesses far into the gulf. Sitting upon the edge we contemplate the most sublime and awe-inspiring spectacle in the world. The length of canyon revealed clearly and in detail at Point Sublime is about twenty-five miles in each direction. Towards the northwest the vista terminates behind the projecting mass of Powell's Plateau. But again to the westward may be seen the crests of the upper walls reaching through the Kanab and Uinkaret Plateaus, and finally disappearing in the haze above Seventy-five miles away.

"The space under immediate view from our standpoint, fifty miles long and ten to twelve wide, is thronged with a great multitude of objects so vast in size, so bold and majestic in form, so infinite in their details, that as the truth gradually reveals itself to the perceptions, it arouses the strongest emotions."

Several times I had started to Point Sublime, but there were difficulties about the trail. Sometime before 1900, Mr. Bass completed a trail on the north side of the river, up under the shoulders of Powell Plateau and out to the desired location.

Starting for Point Sublime. In August, 1901, a party was arranged, consisting of Mrs. J. B. Gayler, of Ridgewood, New Jersey, a learned doctor from St. Louis, Mr. Bass and myself. On Sunday, September 1st, after loading three pack animals with provisions and bedding needed for the trip, we set out down the trail, headed for Point Sublime. To the ferry nothing of particular interest occurred.

From this point on I shall use the diary of Mrs. Gayler as the basis of my descriptions, adding thereto or condensing when necessary. It is written in the present tense, which will be preserved throughout.

At the River. She says: "The sight of the river rouses me to a considerable pitch of enthusiasm. How dirty and muddy a river it is, and how it roars and rages. There is a great rapid a quarter of a mile above where we cross. While we are to cross in still water, the current is strong and bears one on to the worst rapid in the whole river. It is named Stanton Rapid, for at that point one of his boats was dashed to splinters. He numbered it No. 241.

"We part with our animals near a little shelter at the top of the Archaean rocks and scramble down a slippery trail.

Crossing the River. "With some trepidation I enter the boat; a few articles are thrown in, Dad takes the oars, some one pushes us off and we are fairly on the stream. The boat soon strikes the sandy landing on the other side, a considerable distance below, and Dad hands me out with care and courtesy. I occupy myself looking at the structure of the rocks. There are many curious faults and flexures. The river very strange; walls black, gloomy and precipitous. The landing on the south side was solid rock, here a bit of sandy beach between bars of rock. The Doctor is already here. He makes a fire of driftwood near the wall of black rock under which is the stretch of sand. I pick out my sleeping place and begin the making of my bed.

"James, Bass and Dad go back and forth across the river many times to bring our stuff, and daylight is entirely gone long before the job is completed.

Supper on the Sand. "I try to help in carrying things up the bank but am too tired to be of much use. Gather wood for fire. The men had prepared supper by firelight, which we take crouching, sitting or lying down on the sand. The air is mild and soft.

Moonlight. "Monday, Sept. 2, 1901. 3 A.M. Writing by moonlight. The roar of the rapids is constant. One hears it even in sleep. There are occasionally little swirling, flapping noises. What a wonderful place for me—a quiet, New Jersey woman—to be sleeping in.

To the Shinumo. "When Mr. Bass awakes he shows me a large pool of river water in the rocks. It has settled and is clear and cold. After breakfast, the doctor and I scramble up the rocky trail to the plateau above, mount two of the burros and start for the Shinumo Camp. It is 6:30 when we start—quite early I should call it—and we reach camp at 8.00 A. M. A stiff climb nearly all the way.

"What a clear mountain torrent the Shinumo is. It is like our Eastern creeks. Its rocky sides are lined with willows or other green trees and it comes splashing and dashing down as pure and sweet as can be.

Shinumo Camp and Garden. "The camp is a novelty to me. Part tent, part wood, part rock,—part indoors, part outdoors. The fireplace is of stone and out of doors, and the table is a great slab of red sandstone resting on two heavy rock supports. It would hold a ton. There are two good beds. Across the stream a little way down is the Shinumo garden. It seems incredible that there can be a garden here with excellent melons, cantaloupes, radishes, onions, corn, squash, beans, and with fair-sized peach and other trees. They tell me it is a prehistoric garden and that it was discovered by following the ruins of ancient irrigating ditches down to the spot. In the wall beyond are several small cliff-dwellings and storage houses for corn and other vegetables. There are tremendous tilts and flexures in the rock walls on each side.

"Mr. Bass and Dad go off to hunt for the horses and mules we are to use on the trip. The burros will not travel fast enough, though they are going to put me on a large burro they name Belshazzar.

"After lunch each spends the afternoon as he chooses. Mr. James invites me to come and visit a snuggery that he has established, where I find him writing. He reads what he has written, also part of Browning's 'Rabbi Ben Ezra.'

"Tuesday, Sept. 3, 1901. At and preparing to leave Shinumo. The magnitude of the undertaking appalls me. It is so much more tremendous than I anticipated.

The Start. "The saddling and packing of the animals occupies much time. We start about nine o'clock with nine animals, six burros, two horses and one mule. My Belshazzar is slow but very sure. Mr. James rides the mule, a red creature, very nervous and excitable and which they tell me is not well broken and does not like to be ridden.

Ascending the Trail. "We go up a long trail over a ridge, with loose soil, quite barren. The ascent is not very steep but the hillside across which the trail passes slopes down to canyons and precipices which suggest unfathomable depths. At one place the trail, for about fifty feet, is over ashes or some exceedingly loose material that allows the animals to slide very quickly down towards the deep precipice on the right and the sight is most trying to my nerves, but Belshazzar's deliberate walk and sure-footedness soon restore my usual equanimity.

"From this we pass into a canyon or series of canyons where one can plainly see that in the remote past a torrent has poured down, tearing away the soil and tossing huge boulders about. Many naked rocky ledges show, and my burro is occasionally required to carry me up stone steps.

Muav Canyon. "Presently we enter a narrow canyon through which flows a clear, cool stream. Walls of red rock on both sides with, much gray stone. Many large sycamores, cottonwoods and alders, grass and flowers, with maidenhair ferns on the rocks. We stop for lunch under a big cottonwood tree. About four thousand five hundred feet elevation. We leave this lovely spot and go up the canyon which makes a sharp turn to the left. This is Muav Canyon.

Climbing Higher. "After a little distance we emerge from this canyon and leave the stream. Then begins a tremendous climb which I accomplish by clinging to the coat tails of the guide with one hand and sometimes with both hands, he holding tight to the burro's tail ahead of him. Belshazzar accepts this—to me—novel situation with accustomed cheerfulness and does his best to haul us up the mountain, stopping occasionally to recover his breath. Finishing this part of the ascent, we come to a fertile plateau with trees in great number and variety. At an angle of the canyon below, nearly opposite the steep trail up which we have just climbed, is the eroded terminus of a great promontory, carved into a high and slender pedestal upon which stands a rude figure not unlike one of the wooden statues seen in the old Franciscan missions of California. Below this the rock strata are curved and twisted into all kinds of shapes. In one place there is a fold where the strata seem to have been curved and forced almost into a circle.

"On this plateau we still see the canyon with its perpendicular gray stone walls. It falls below our trail and we ride along the brink of it and down in the bottom see the black entrance to a cave. Then we come to the dry bed of a stream which we follow until we come to water. The quantity is small but it is sweet and pure. We camp here; elevation six thousand one hundred feet.

"The canyon walls are steep and the bottom narrow. We are in a heap together,—rolls of bedding, camp-fire, burros, horses, mules, men, kyacks containing food, saddles and packs, myself, etc., all in a very small space.

The Charm of the North Side. "The north side of the canyon is much more beautiful and diversified than the other, and no one can really know the canyon who does not cross and climb to the summit on this side. There is a greater variety of fine views, a good proportion of fertile country and a far better opportunity for studying the geological formation.

"Wednesday, Sept. 4, 1901. We have had a very cold night and though my bed was most comfortable I awake feeling rather miserable. My courage almost fails and I talk of giving up, but after awhile feel better and decide to go on.

"A discussion goes on as to the time we shall spend on the trip and the determination is finally reached that, if possible, we shall return to this spot from Point Sublime in four days.

"The little stream, which failed in the night, now runs freely, the result of condensation of moisture in the atmosphere above. We start again and ascend a steep, loose trail in the manner of yesterday. The trail is very pleasant here, springs of excellent water coming out from under the cross-bedded sandstone and trees of considerable size shadowing the way.

The Saddle. "At the Saddle there is a long pause for repacking the burros. I am started up the next

and last steep climb on my burro. After a little the trail becomes very steep and dangerous looking and I am ordered to dismount and finish the climb on my feet with the aid of Belshazzar's tail. He is in a hurry and sometimes very unceremonious with me.

On the Kaibab. "We are now on the top of the north side,—really on the summit of the Kaibab Plateau. Dutton Point, the great salient promontory of Powell Plateau, seen so clearly from Bass Camp on the south rim, is close before me, and views and vistas in every direction are glorious and sublime. We ride on to Swamp Point. The views are magnificent, but who shall attempt to describe them? We soon enter a pine forest. Tall pine trees and Douglas spruces are the principal trees, with many beautiful groups of white aspen. Rich grass and wild oats and great quantities of beautiful flowers. We see many deer. We stop for lunch and some photographing is done.

Kanab Unats. "After lunch we start for Kanab Unats and pass through many grassy valleys leading into one another with many windings. We have some difficulty in keeping the right trail. Mr. Bass has an excellent general knowledge of the right direction but he has had to wander to and fro in his desire to find water and dare not leave us, so we have to accompany him in his searches. The result is we cannot reach Kanab Unats to-night. We go up one very picturesque part of the trail where a deep gulch lies on the right filled with old pine trees and many fallen ones, a true specimen of the primeval forest. We see a small band of cattle grazing. After luncheon I attempt to walk alone in the forest and immediately lose my sense of direction. After some yelling on my part the men come to my rescue. We start on again, the doctor putting the saddle on Belshazzar for me. When I dismount, the result of unskilled effort appears, for, as soon as I throw my weight over to the left, the saddle turns and I am dumped upon the ground. We camp at an altitude of eight thousand feet; short of water.

Short of Water. "Thursday, Sept. 5, 1901. Near Kanab Unats. 6 A. M. Very cold. Breakfast is prepared. I am allowed two tablespoonfuls of water for toilet purposes. I help a little with the cooking. We are to a thick wood. It is a fine, clear, sunny day, but a chilling wind is blowing.

Off for Water. "We make a late start, and go on to Kanab Unats where we expect to find water. We arrive there about ten. Soon afterwards three cattlemen come by. A conference with them is held. They talk doubtfully about water, but tell where they think it may be found. They are much surprised to hear that I have crossed the Canyon. With their consent I kodak them. After they depart Mr. Bass and Mr. James start off for water, Mr. Bass with one horse and all the canteens to a spring he knows of where fine water is to be had, and Mr. James with all the animals to a place where water fit for stock may be found. They both return in about two hours, pack the animals, and we start again about 3:20 P.M. for Point Sublime. We go through several grassy, well-wooded ravines, very nearly on a level, through much fallen timber and thickets. Then we cross several of them. I scramble down off Belshazzar and down a very steep hill. Mount again and go on by myself, zigzagging up a steep hill. This is mostly through an oak thicket without a trail. Over another ravine and I am sure now we are near the end of our journey. Up another slight ascent and we come in sight of the Canyon. We have left the tall trees and the thick grass, and now have only mesquites, cedars, yucca and cactus. But we have a good trail.

On Point Sublime. "At last we are on the Point itself. So ardently desired, and with only an hour of daylight left, we begin to study the wonderful panorama. I am photographed rounding up the burros. I am given a sheltered place under a juniper tree for my bed, and make an arrangement with my canvas to keep off the wind. A very comfortable bed. This Point runs out far into the chasm, is narrow for a considerable distance, sides very precipitous and the edges describing a very irregular line. Very near the extreme end is a clump of cedars, with trunks and lower branches so densely matted together as to form a good shelter on two sides from the wind (which blows furiously). It is in this shelter that I place my bed, making with my canvas a protection against the wind on the third side so that my sleeping place is as cozy and warm as can be.

"Friday, Sept. 6, 1901. At Point Sublime. I sleep well and wake refreshed. Many photographs are taken. The men go to explore another point not far off and I stay in camp. I rest as well as I can in the face of such a stupendous spectacle. Dutton's descriptions are wonderfully vivid and accurate—yet words, do not convey ideas to those whose imagination is not large enough to realize the full meaning of the words.

On the Return. "We start on the return at eleven o'clock having spent about seventeen hours on the Point. At first we follow the trail by which we came. Then our leader disregards the trail and makes our course in a more direct line. We go over ridges, some of them terribly steep. We go through several lovely valleys with the ridges that overlook the canyon on our left. The air is still and cool down where we are, but we can see the tops of the trees that show above the ridges tossed about in a violent wind and can hear its roaring through the forest. We camp about three-quarters of a mile from a spring, and by orders I sleep under a tree in company with many beetles. It is very cold. Camp-fire is comforting.

Into the Canyon Again. "Saturday, Sept. 7, 1901. We leave camp at 8:20. I put out fire while men are

packing. Find track of small five-toed animal on the trail. We go by cattle-trails a short cut to Swamp Point through the forest, over ridges, through thickets and some of the grassy valleys. Out on Swamp Point again I am shown Bass Camp on the south rim. It is scarcely discernible even with glasses, the distance is so vast. We all walk down the steep descent from this Point and make quick time to the place where we camped Sept. 3. We descend one thousand nine hundred feet in one hour and twenty minutes. After lunch, the men then cache much of the remaining provisions and cooking outfit for future use, and we go on riding as fast as possible down the dry bed of the stream. Then out of this, through a narrow canyon, past the gray-rock walls and gulch with black cave at bottom and slide in the talus above, over the fertile plateau, long descent on foot, where as I zigzag I see the men and the burros what seem to be hundreds of feet below.

"On down another dry stream bed, many stony descents in a shut-in canyon. Out of this into more open country, but over ridges, up and down. We come down to that part of the trail which I feared most in daylight and now we have only the starlight to enable us to descend. Mr. Bass takes me in charge and Mr. James goes up over the ridges to round up the burros which have been left to their own devices. A torch of sage-brush is lighted to find the trail. At last we reach the bottom. The men throw some blankets on the ground for me and I fall upon them. They go down to the Shinumo, which is only a few yards away, prepare supper and bring a cup of hot coffee for me. I return with them, make my bed, eat a hearty supper and then fall asleep with the roar of the Shinumo in my ears. My bed is comfortable and I have a feeling of perfect safety and confidence.

Watermelons in the Canyon. "Sunday, Sept. 8, 1901. We are on the Shinumo, and only half an hour's ride above the camp. What a beautiful stream it is; cataracts, still reaches, rapids, sandy shoals, deep pools, and the water so pure, blue and clear. We cross and re-cross many times, through thickets of willow and mesquite. I am many times scratched and my hat is forcibly snatched from my head. At camp I feed watermelon rinds to Belshazzar who receives them as gratefully as I did the melons. How strange to find them growing here,—so ripe, rich and delicious. I feel very weary but deeply regret having to leave this lovely place. We start for the river. When the others arrive the packs, etc., are taken across in three loads. The four of us go over in the last load. Scramble up the Archaean by myself and sit in the shade, near the shelter tent, until I am put on the burro Joe and started off with the doctor.

Back at Bass Camp. "Dad had brought the burros here to receive us, all the animals we had ridden to Point Sublime having been left on the north side. At Bed Rock Camp we all have lunch; and then at 4:00, the others with the burros having gone on ahead, we follow. I remain on my burro all the way up, save at three places, where Mr. James deems it best for me to dismount. At last, we make the final ascent, I see the tent above my head, then the roof of the house at Bass Camp, and in another moment or two the most memorable and wonderful trip of my life is over."

CHAPTER XIII. How The Canyon Was Formed*

* This chapter, while in manuscript, was read by Dr. Charles D. Walcott, Secretary of the Smithsonian Institution and formerly Director of the United States Geological Survey, and also by Professor Matthis, of the Survey. It may therefore be accepted as a fairly accurate and authoritative presentation of the geological conditions existent at the Canyon, with their explanations, as accepted by the leading scientists of to-day.

The beginning of land. In the long ago centuries, when the world was "without form and void," waters covered the face of the earth, and darkness brooded over the waters. As the earth's crust began to shrink under the water, in the process of cooling, the first masses to crumple up, to wrinkle, were the first to arise above the surface of the vast, primeval, shoreless ocean. They appeared as tiny islands, pinnacles, or ridges thrust up, exactly as we see them sometimes on the coast,—hidden at high tide; appearing again at low tide.

The Laurentian Hills. Nature had plenty of time before her, so she did not hurry her work, and it took long centuries before there was any large amount of land thrust up out of the bosom of the sea. The scientists are able to tell us, with some definiteness, which came forth first. They say that on the continent of America the earliest born land was a mass of granitic rock in Canada,—the Laurentian Hills. The next to peer above the surface and feel the warmth of the sun were peaks and ridges that made islands of themselves, in what are now known as the Rocky Mountains and the Appalachians. Now, at last, the great waves of the sea and the resistless storms had something to play with, and they

pounced down upon the land as with tooth and claw. They rubbed and pounded, raged and smashed for a thousand years, and then another thousand, and still another, while Mother Earth uneasily thrust forth her rocky children out of the ocean into the light of day. Surprised at such treatment by the storms and seas, the newly born earth masses began to crumble and "weather." The detached fragments slipped back, or were washed back, into the deeper or shallower parts of the ocean, and were there tossed back and forth, pounded and ground into sand and silt, into pebbles and boulders, while more land was slowly being thrust out for the angry sea to work upon. Layer by layer, the ground-up masses were deposited in the inner ocean bed, parts of which were now practically shut off from the vast ocean beyond. How many centuries of centuries this process continued geologists do not tell us. Time is so vast, so long, that they cannot divide those early days into weeks, months and years, as we now do.

The Continent is born. After many millions of tons had been thus ground up and tossed about and mingled with the waters of the seas, the earth, in a fit of fiery anger, turned and baked them, with intense heat, out of all semblance to their former appearance. These baked masses, in the course of time, were thrust up out of the seas, mashed and macerated once more, again deposited as sand, silt, pebbles and boulders, and again burned. These processes followed each other, how many times we do not know, the earth all the while keeping up her steady uplift of the children of her bosom out of the great sea. Higher and higher came the land. Further and further receded the sea, until, in due course, the sun shone upon a vast area of land that was the rude skeleton of what is now the continent of North America.

It would have taken a keen eye, however, to have imagined from that which we see to-day what was there. The Gulf of California reached far up, even into Nevada, and covered what are now the Mohave and Colorado Deserts; there was no California Coast Range; the Gulf of Mexico was vastly larger than it is to-day, covering all Florida, and reaching up the Mississippi Valley half-way to the Great Lakes.

The First Strata. It was just preceding the last uplift of this epoch that the era of deposition of rock debris was so prolonged that twelve thousand feet of strata were washed into the bed of the sea, in the region now known as the Grand Canyon Country. It was at the time when life was beginning to dawn, for in the remnants of the strata are found fossils of the earliest known life. These strata, therefore, are of immense interest to the geologist, as they are the first known rocks containing life to emerge from the primeval sea. Within the last few years, they have been called the Algonkian Series, and later I shall speak of them more freely.

Prior to the deposition of these Algonkian strata, the Laurentian rocks (the granite) upon which they rest were subject to a long period of "planation,"—as the grinding down and leveling of rock surfaces is termed. After this planation was complete, a subsidence occurred; the whole area became the bed of an inland sea, and upon the planed-down granite, the debris that formed the Algonkian strata was washed.

While they were being deposited, the whole region was the scene of several seismic and volcanic disturbances, for great dykes and "chimneys" of lava are found, showing clearly that, by some means or other, the strata were broken and shattered, cracked and seamed, and that through these cracks the molten lava oozed—forced up from the interior of the earth. It spread out over the Algonkian rocks in small sheets or blankets, which here and there are still to be found to-day.

Tilting of the Algonkian Strata. Slowly this twelve thousand feet of strata emerged into the sunlight. In the uplifting processes, the surface of the earth, where they were, became tilted, and these strata therefore "dipped" or "tilted" away from the perpendicular. As they emerged, weathering and erosion began. It is most probable that this process of degradation began and continued while the topmost strata were at or near sea level, so that it was a simultaneous process with the uplift.

Erosion of the Algonkian. How many centuries this weathering and washing away process consumed no one knows. At the close of this epoch, however, the Algonkian strata had been eroded almost away, owing to its tilted condition, so that in some places even the surface of the Archaean was exposed, and suffered the planing-down process. Figure 1 on plate facing page 98 is a suggestion as to the possible appearance of the rocks at this time.

Even then, in those far-away, early ages of history, if one had been present to measure these strata, he would have discovered the astounding fact that, although he had measured them and found twelve thousand feet before they began to emerge from the ocean, there were but about five hundred feet of them left. This is one of the interesting facts in geology,—that an observant reader can deduce so much from so little.

The twelve thousand feet deposit. "But," asks the layman, "I cannot possibly see how, if only five hundred feet of strata are left, any one could ever tell that there were once twelve thousand feet. If eleven thousand five hundred feet are gone, how do you know they ever existed?"

A very reasonable question and one very easily answered. Refer to the sketch. Let the bracket on the right show the present width of the remaining strata, viz: five hundred feet. Now observe the tilted condition of the remnants. To get the original height of the depositions begin with No. 1, the stratum nearest the Archaean and measure that. Suppose it gives us five hundred feet. No. 2 gives two hundred feet; No. 3, five hundred feet; No. 4, one hundred and seventy-five; and so on up to No. 14. As these strata were deposited horizontally, all we have to do is to mentally replace them in their horizontal position. Throw the tilted strata back again into their original condition, and by this method of measurement it is seen that the twelve thousand feet can be made up. Figure 2, facing page 98.

Another interesting question here arises: "What became of the vast quantity of sand and silt and pebbles that formed and were carried away during such a gigantic process? For, think of it, eleven thousand five hundred feet of strata, or rock, two miles high, almost three times as high a mass as the present distance in vertical height from El Tovar to the river! Where has it all gone?"

Naturally an answer to these questions is mere conjecture, as only from a study of the facts revealed underneath the present strata, can any comparative knowledge be gained of the conditions existent at that prehistoric age. There may have been one river, or a score, or any number between, and it is probable one or more rivers carried the Algonkian debris westward and deposited it, as the Colorado River (not brought into existence until centuries later) is now doing with the debris of the existent strata.

Another Subsidence. Now, a new era is about to dawn. Planed and smoothed off as they are, the Algonkian and Archaean masses are to be submerged once more in the ever receptive ocean. A period of subsidence occurs, and the whole area is soon hidden under the face of the sea. But, all around these are masses, some day to be mountain peaks, that refuse to sink again into the sea. Then the forces of the air assail them. If they cannot be drowned, they shall be gnawed at, smitten, cut and worried by the air, the chemicals of the atmosphere, the storms, the rain, the hail, the frost, the snow, and thus made to feel their insignificance. Slowly or rapidly, they yielded to this disintegrating process, and as the rocky masses broke up, they were washed by the rills and streams into the bed of the sea, where they soon rested upon the tilted ends of the Algonkian strata and exposed surfaces of the Archaean masses, waiting for them.

The Deposition of the Tonto Sandstones. The wise men tell us that this ocean was a salt sea, and that it was quite shallow while these new sediments were being deposited. Little by little one thousand feet of the sediments of this epoch were washed down, so that it is very likely that the tilted strata upon which they rested slowly sank lower and lower to accommodate them. Then, for some reason or other, there was a rest for a while—a few hundreds or thousands of years—and the masses of sediments became cemented into sandstone and shale, which we call the Cambrian formation, or the Tonto sandstone. This is to be seen resting both upon the Archaean and Algonkian from the porches of El Tovar. It is composed of strata of dull buff, very different from the brilliant reds—almost crimsons—of the Algonkian, and the bright reds of the strata which later were to rest above them.

Geological Terms. What an audacious science this geology is! How ruthlessly it wrests aside the curtain from the mystery of the past, and how glibly it deals with thousands, millions of years, tying them up into packages, as it were, and handing them out labeled "eras" and "periods." As usual, the names made by the wise men are hard to pronounce, and seemingly hard to understand. But a few minutes will take away the difficulty. They divide the eras into four, viz.: 1, Proterozoic; 2, Paleozoic; 3, Mesozoic; 4, Cenozoic. All these "zoics" have to do with life. Proterozoic means before life, and signifies the rocks that contain no fossils indicative of life; Paleozoic signifies the most ancient forms of life; Mesozoic signifies "middle life" or those between the most ancient and the Cenozoic, or recent forms of life. The periods are lesser divisions of the eras. In the Proterozoic, there are two periods, viz.: the Archaean and the Algonkian. The Paleozoic has six periods, viz.: the Cambrian, Ordovician, Silurian, Devonian, Carboniferous and Permian. The Mesozoic era has three periods, the Triassic, Jurassic and Cretaceous, while the Cenozoic era names five periods,—the Eocene, Oligocene, Miocene, Pliocene and Pleistocene.

Absence of Certain Strata. To shorten our story, let me at once say that during the periods that the Ordovician, the Silurian and the Devonian were forming, the Grand Canyon region was either above water so that it received none of these sediments, or, if any were deposited, they were almost entirely removed by the weathering processes before described, ere the region again sank into the ocean to receive the deposits of the Carboniferous epoch.

The Carboniferous. During this latter period, more than three thousand feet of strata were deposited. These are the most striking in appearance of all the Canyon strata, for they reach from the Tonto shales to the rim, and consist of three principal strata (with many smaller ones in between). The largest is the red-wall limestone, which constitutes the base of nearly all the architectural forms found in the Canyon,

and is the thickest of all the strata. It presents the "tallest" wall of the series. The two separate walls, one above the other, on the top of the Canyon, as seen in the arms of the amphitheatre at El Tovar, are the other two wide members of this Carboniferous period. The lower is the cross-bedded sandstone, and the upper the cherty limestone. There is a remarkable difference in the appearance and the material of which these Carboniferous strata are formed, and those of the East and Europe. We generally think of coal-beds—carbon when this period is mentioned. Here there are none. In the East, in England, and in other parts of Europe, vast marshes existed in this period, and the rank vegetation of these marshy areas formed the coal-beds, with which the Carboniferous there abounds. It is only by the fossils found that the periods to which the various strata belong are determined, and the fossils, millions of which abound in the upper limestone, are clearly of the Carboniferous epoch.

As these strata and this period bring us to the "rim" of the Canyon, it might be easy to imagine that the processes of uplift and subsidence, and deposition of more strata, as far as the Canyon region is concerned, now cease. Such, however, is not the case.

Later Strata. As we go away from the Canyon, either north or east, we find thousands of feet more of the later depositions, and the geologists affirm that many of these at one time may have overlaid the Canyon region. There is circumstantial evidence, amounting almost to proof, and Figure 3 of plate facing page 99 suggests what that evidence is. It should be carefully noted that the Canyon has been cut through the highest portions of a ridge, which runs generally from east to west, and the slopes of which, therefore; were north and south from the ridge. As one travels north from the Canyon, he finds all the way along, for hundreds of miles, that he goes on a down slope for a number of miles and then suddenly comes to the jutting edges of slightly tilted strata (only 2 degrees) which make a cliff up which he must climb. Arrived at the top of this, the downward descent begins again, until another ridge of these slightly tilted strata appears, see Figure 3 of plate facing page 99. Thus he continues up into Utah, and south and east into Arizona.

Now, in imagination, restore these cliffs of Permian, Triassic, Jurassic and even Cretaceous strata over the whole Canyon platform. Figure 4 of plate facing page 99.

Red Butte, which is the prominent landmark seen from the railway on the right, when going from Williams to the Canyon, is said to be a remnant of the Permian.

Deposition of Strata in Shallow Water. It is, I believe, generally accepted by the geologists that the accumulation of much of the sediments of the Cambrian, Carboniferous, Permian, Triassic, Jurassic and Cretaceous periods took place in shallow water, and that the sea bottom slowly sank under the weight of the increasing deposits. Hundreds, thousands of years must have elapsed during the process, for the indications are that the sinking did not exceed a few inches every hundred years! As carefully measured, these sediments then amounted to about two miles. Imagine, then, these Cambrian rocks, that at El Tovar are clearly seen above the "granite" or Archaean, sunk in the ocean, to the depth of two miles, and covered over with the various strata, the topmost of which was barely above sea level at periods of low tide.

Cretaceous Uplift. Then began another epoch of uplift. Slowly the Cretaceous rocks emerged from the sea, and were subject to the fierce attacks of nature that produce erosion. Now we have to grope blindly for a while, as the wise ones do not have facts enough upon which to speak with definite certainty. But it is assumed that a great warping of the earth's crust took place, and that in this revolution some of the plateau sank,—supposedly the northern part, though it certainly extended across the Canyon nearly as far south as Williams and Ash Fork, and other parts—the edges—arose, and thus formed a basin which became another vast inland sea.

Eocene Lake. We know this was an inland sea, and had no connection with the ocean, for all the fossils and sediments deposited in it reveal that they are fresh-water organisms. In this sea, as in the earlier oceans, vast deposits of sediment were made in the early Eocene period, and another period of subsidence occurred. Then the great lake was drained, and the uplift began, slow and sure; then, and not before, were the conditions existent that have made the Canyon country as we see it to-day. Peaks and islets received the rainfall, tiny rivers were formed that grew larger and cut their way in deeper, as the uplift continued. The principal stream, which was then born, was the Colorado. It is supposed, from various evidences, that the rainfall was very much more abundant then than now, and consequently the rivers had greater flow, and more eroding and carrying capacity. The uplift continued, and the geologists tell us it did not cease until about fifteen thousand feet, deposited since Cretaceous times, were thrust up into the air. As almost all this mass of deposition has disappeared from the immediate Canyon region, we are compelled to believe that it has been swept away down the Colorado River to join the sands of the Carboniferous and later periods in the Colorado Desert, the Salton Basin, the great low region of Lower California, and the Gulf itself.

Less by Erosion in the Canyon Region. Now figure out for a few moments the results of these

different erosive periods. Eleven thousand five hundred feet of Algonkian gone; a small amount of erosion in the Cambrian epoch, the depth of which is unknown; and then the great denudation of the Eocene period sweeping away upwards of fifteen thousand feet of strata, give us a total of twenty-six thousand five hundred feet that have totally disappeared from the Canyon region. A vertical mile is five thousand two hundred and eighty feet. Mount Washington is about six thousand five hundred feet above the sea,—a trifle higher than Mount Lowe, near Pasadena, California. Take off from this six thousand five hundred feet, say one thousand five hundred feet, for the level of the country at the base of these two mountains, and then imagine a region five times as high as both of them, covering an area of country of possibly thirteen thousand to fifteen thousand square miles, slowly planed off by the erosive forces of nature.

Formation of River Beds. How was it done? I have spoken of the peaks and islets that first emerged from the Eocene Sea, and received the rains. Down their slopes ran the earliest watercourses, first as rills, then as creeks, finally as rivers. The higher the peaks ascended, the more the accompanying land was lifted up, and therefore the longer and deeper became the rivers. The course of a river once established, it is exceedingly difficult to change it—hence the law that geologists call "the persistence of rivers." By and by, the uplifted country appeared as one vast area of river valleys, separated by stretches of plateau. Little by little, working by laws that are pretty well understood, the swift flowing avers cut downwards. When their velocity ceased, the widening of the river courses began, and progressed with greater rapidity, so that, in time, the divides that intervened between the rivers were worn away,—a process rudely shown in Fig. 5 A. B. C. and D. of plate on page 110.

The Formation of the Canyon. Now, in imagination, let us hark back to the day when this plateau was in the condition thus described. Nearly everything in the way of strata has been planed down to the Carboniferous rocks. The plateau is about at sea level. One great river already exists, with two arms, now called the Green and the Grand, the main river some day to be known as the Colorado. Slowly the uplift begins. It is a fairly even process, and yet there is slightly more pressure brought to bear under the southern portion, so that the whole mass has a slight tilt to the north. Professor Salisbury found certain beds of rock at seven thousand eight hundred feet above sea level at the base of the San Francisco Mountains near Flagstaff. Forty-five miles north, at the Grand Canyon, these same beds are only six thousand four hundred feet above sea level, while at the Vermilion Cliffs, another forty-five miles to the north, they are but four thousand four hundred feet above the sea.

Yet in spite of this northward tilt, when the eye ranges over the country to the south and west, from the upper porch of El Tovar, a large area of depression can clearly be seen, showing that surface erosion has planed away much of the upper crust.

The Plateau Region. Now we are ready to take a look at the borders of the plateau region. On the north, it extends into Utah, where still higher plateaus bound it. To the west, it extends by gigantic steps into the desert region. The main step is along the Grand Wash, near the one hundred and fourteenth meridian. To the south, there is one glorious step, known as the Mogollon Escarpment (locally the Red Rock Country), some three thousand feet high, which extends for a number of miles east and west, and then breaks down. This step and broken levels lead to the irregular lands of Central and Southern Arizona. On the east, the plateau extends to the Echo Cliffs beyond Marble Canyon, and as far as the ridge of the Continental Divide, where the Santa Fe crosses the Zuni Mountains, east of Gallup, N. M.

Present Conditions. With this general view of the great plateau in our mind's eye, we are prepared to examine present conditions at any given spot in the Canyon. Let us, therefore, take a seat at El Tovar, and try to read a few pages of the stone book of Creation as opened there. Suppose all this vast region at about sea level, and the uplift just beginning. The course of the Colorado River is already well defined. As the uplift continues, the cherty limestone and possibly the cross-bedded sandstone are both cut through, as the plateau slowly emerges. Whether the process of uplift is slow or rapid, as soon as a stratum emerges, it becomes subject to the influences of weathering, and the uppermost strata appearing first, they are weathered most. Hence the recession of the uppermost cliffs is greater than that of the cliffs lower down. The differences in hardness and resistance to weathering are alone responsible for the step-like profile of cliffs and terraces. The lower platform owes its width entirely to the rapid weathering and recession of the soft shales, which overlie the Tonto sandstones. The red-wall limestone, on the other hand, remains standing out as a cliff because of its exceeding durability.

The Faults. During the final uplift, the river cut through the Cambrian and Algonkian strata, and into the Granite Gorge as we find it to-day, and the process is still slowly going on. During these various periods of uplift, there were other changes occurring. Sometimes the uplift was uneven, certain parts of the plateau being lifted more rapidly than other parts; then occurred breaks in the strata, called faults. There are a great number of these faults in the plateau country, most of them crossing the Canyon from north to south. This faulting, as is readily seen, would produce cracks, and as the uneven

uplift continued; the strata on one side of the crack would be lifted higher than the strata on the other side. Or, the strata on one side of the crack would be uplifted, while the other would subside.

Bright Angel Fault. El Tovar rests directly upon the strata affected by the Bright Angel Fault line. On going down the Bright Angel Trail, one cannot fail to see, as he passes the tap of the cross-bedded sandstone, the break in the strata. To the left it is fully one hundred and fifty to two hundred feet higher than it is on the right. The same depression may be observed in driving out to Hopi, Point, or returning. The stratum on which the road is made should be at the same level as the stratum on which El Tovar rests.

Fault at Bass Camp. This fault is but one of a score or more on the plateau. At Bass Camp there was a fault which displaced the strata on each side of the "break" to the extent of four thousand feet. Later, another fault occurred, which readjusted the displacement somewhat, and reduced the difference to two thousand feet, yet left the evidences of the former wide divergence. It was also during these uplift periods that the volcanic mountains of the region came into existence, as the San Francisco Range, Mounts Kendricks, Sitgreaves, Williams and Floyd on the south, and the Uinkarets—Mounts Trumbull, Logan, Emma—on the north.

Lava Flows. In one place, south of Mount Emma, Powell's party saw where vast floods of lava had flowed from it into the river. They declare that "a stream of molten rock has run up the Canyon three or four miles, and down, we know not how far. The whole north side, as far as we can see, is lined with the black basalt, and high up on the opposite wall are patches of the same material, resting on the benches, and filling old alcoves and caves, and giving to the wall a spotted appearance." All these volcanic mountains can be seen from Hopi or Yavapai points, near El Tovar.

The Algonkian Strata. The Algonkian strata of the Grand Canyon are by far the most interesting; Major Powell was the first to call attention to their existence in his report of explorations of 1869-1872, and he discusses their origin and history as far as was possible with the small amount of data he had at hand. Later Dr. Charles D. Walcott, his successor as Director of the United States Geological Survey, and now the Secretary of the Smithsonian Institution, spent a full winter in the heart of the Canyon, especially studying the unique formations. Unique they are, for, though found elsewhere on the earth, they are exceedingly rare, and, up to this time; had received little study and were unknown and unnamed. The area studied by Walcott lies at the very entrance to the Grand Canyon, near where the Marble Canyon and Little Colorado Canyon join the main one. While the series cross the river and are a fine feature of Red Canyon Trail, the main study was done on the north side. Dr. Walcott thus locates the site of his studies: "This area, between 35 degrees 57 minutes and 36 degrees 17 minutes north latitude, and between 111 degrees 47 minutes and 112 degrees west longitude, is in the valley portion of the Canyon, between the mouth of Marble Canyon and a point south of Vishnu's Temple, a little west of where the Colorado River changes its course from south to southwest. It is wholly within the greater depths of the Grand Canyon, east and southeast of the Kaibab Plateau. The intercanyon valleys of this portion of the Grand Canyon extend back from three to seven miles west of the river, and are eroded in the crest of the Monoclinal fold that forms the eastern margin of the Kaibab Plateau."

There are also interesting remnants of Algonkian directly opposite El Tovar to the west of the Bright Angel Creek. They are easily discernible by their brilliant geranium or vermilion color. They extend for a mile or more westward, and rise above the Tonto sandstones, which properly belong above them.

The most remarkable deposit and exhibition of Algonkian strata in the Canyon, so far as known, occurs directly east of the great Kaibab Plateau, opposite the Little Colorado River. Here there must be several, possibly five or six thousand feet of these interesting strata, which Nature has allowed to remain up to our day. Geologists are now investigating them more thoroughly than ever before, and we may expect, when they publish the reports of their labors, that our geological knowledge of the Algonkian epoch, and possibly of other puzzling matters, will be much increased by the light they will throw upon them.

CHAPTER XIV. The Canyon—Above And Below

The Canyon Rim. There are several rather remarkable and surprising points of difference between the Canyon on the rim, and the Canyon in its depths. Above, the whole Canyon region, save during the rainy season, is waterless, and while not barren, owing to the growths made possible by winters' snows and summers' rains, it is a veritable desert as far as water, whether in streams, creeks, rivulets or springs, is concerned.

Drainage of the Canyon. On both sides of the Canyon, all the surface water of the rains drains away from the Canyon for miles, and not until it has flowed, perhaps from within a few feet of the edge of the

abyss itself, from twenty to a hundred miles, does it empty into the drainage channels which, burrowing down into the earth, reconvey the water back, by circuitous routes, into the depths of the Canyon, there to add to the flow of the Colorado.

Rain at El Tovar. Take rain that falls, for instance, at El Tovar itself, within sight of the Canyon. After a heavy storm, the visitor may see it dashing down the Bright Angel Wash (up which the railway runs) to Bass Station, where it turns and enters the narrower section of the Wash. It flows in a general southwesterly direction, and enters the Coconino Wash, which discharges into the open plain, once the bed of the great inland Eocene Sea. Here it disappears.

An Underground Stream. In this plain are some breaks in the rocky bed, which allow the water to flow down to join the underground current of the Havasu (or Cataract) Creek, which runs on the northern slope of Bill Williams Mountain. This underground stream (as explained in the chapter on Havasu Canyon) emerges at the head of the village of the Havasupai Indians, in a thousand springs, and then flows on, over several precipices, to the lower levels, thus making the exquisite waterfalls that have rendered this Canyon world-famous. It finally reaches the Colorado some fifteen miles away, where its clear blue waters are soon lost in the muddy flood of the "Red."

Water in the Canyon. After one has ridden in the hot summer sun over this waterless region, and seen the waterwagons of the miners and sheep men, and the great train of water-tanks being hauled for the guests at El Tovar, it is a surprise and a wonder to find below, in the heart of this rocky-walled Canyon, a mighty river dashing its headlong way to the west. Many a time, after a week of riding horseback on the plateau above, until every particle of moisture seemed to have evaporated from my body, have I gone down the trail to the river and camped there, enjoying a swim several times a day, and rowing up and down one of the quiet stretches, between the rapids, where boating is not only possible but reasonably safe. In the Bright Angel and the Shinumo on the north side, and the Havasu on the south side, one may swim, or at least soak and paddle, in cooling waters, where waving willows, giant sycamores, and green cottonwoods sway above the streams, and rich verdure of great variety lines their banks. What a wonderful contrast,—above and below!

Difference between the Rim and the River. Another remarkable difference, or surprise, is found when one leaves the rim above, where the weather is lovely and there is not a sign of rain, and go below to the river, which gives evidence of a great rise. How can the river rise without rain? Yet it seems to, and one almost doubts the evidence of his own senses.

Experience on the River. Engineer Stanton tells of an experience as his party went through the river: "About 2:30 P. M. we heard a deep, loud roar, and saw the breakers ahead in white foam. With a great effort we stopped upon a pile of broken rock that had rolled into the river. When we went ahead to look, much to our surprise, the whole terrible rapid that we had expected to see had disappeared, and there was only a rushing current in its stead. While we stood wondering, there rose right at our feet those same great waves, twelve to fifteen feet in height and from one hundred to one hundred and fifty feet long across the river, rolling down stream like great sea waves, and breaking in white foam with terrible noise. We watched and wondered and at last concluded that this was the forefront of a vast body of water rolling down this narrow trough from some great cloud-burst above. (We learned afterwards that there had been such a cloud-burst on the head-waters of the Little Colorado.) Believing that discretion was the better part of valor, we camped right there on that pile of rocks, fearing that, although our boats would ride the waves in safety, we might be caught in one of these rolls just at the head of a rapid, and, unable to stop, be carried over the rapid with the additional force of the rushing breakers."

High and Low Water. The piles of driftwood found on the rocks in the Canyon reveal a difference of upwards of two hundred feet between high and low water. This, however, does not refer to the general condition of high water, but to exceptional cases. As, for instance, I myself once saw a mass of rock, the whole face of the cliff, containing doubtless millions of tons, fall into the trough of the stream. The whole course was at once dammed up, and the river rose sixty feet in one hour before the principal mass of rock was made topheavy by the power of the flood. Then it rolled over with the force of the millions of tons of water behind it, and crumbled as it rolled. The mighty wave dashed on, carrying everything before it. In less than another hour the rock mass had disappeared, and the water had resumed its normal level. A rise of fifty to seventy feet is not so very unusual in the heart of the gorge, where it is narrow and the waters would necessarily pile up. To see such a rise, without any evidence of a rain above, is a wonderful experience that one occasionally enjoys.

Snow on the Rim. Another remarkable contrast is observed by winter tourists. On the rim at El Tovar, Grand View, or Bass Camp snow may fall during December, January and February, and sometimes in March, though it quickly disappears. This is not surprising when one considers the high altitudes. The weather is then sometimes quite frigid, but it is a dry cold which rapidly yields to the warm midday sun.

Do not imagine from this general statement that winter, as we know it in the East, is the usual thing at the Canyon. Quite the reverse. There are more sunshiny, warm, windless, stormless and no-snow days than otherwise, taking one year with another. Real winter weather often stays away until well into January. Some years it is a negligible quantity. At no time need it be feared by the traveller.

Trails in Winter. The trails for half a mile, or even a mile, down into the Canyon, during a part of the winter, are sometimes covered with light snow. As soon as the snow line is passed, the climate begins to change. The cold is less penetrating, and by and by one enters what might be called a temperate zone. Warmer and more comfortable it becomes, until, on reaching the river, the word "delicious" alone conveys the rich sense of satisfaction that one feels all over the body in the delightful sensation experienced. No time is so agreeable for a long stay in the depths of the Canyon as in the heart of winter. A semi-tropical climate below, while above, within three hours easy ride, a snowy winter may be reigning supreme!

Winter in the Canyon. Robert Brewster Stanton, who made his successful trip through the Canyon in wintertime, comments on this as follows: "It has been the fortune of but few to travel along the bottom of the great chasm for a whole winter, while around you bloom the sweet flowers, and southern birds sing on almost every bush, and at the same time far above, among the upper cliffs, rage and roar, like demons in the air, the grandest and most terrific storms of wind and snow and sleet that I have ever witnessed, even above the clouds among the summit peaks of the Rocky Mountains."

Change in the Flora. This climatic diversity above and below is noticeable all through the year to the man or woman of sharp eyes, in the difference of the flowers, the shrubs, and the trees. Above are the pines, the cedars, and junipers of the cooler climes. The further down one goes, the greater the change becomes. The pines drop out, then the cedars and junipers, and when one reaches the patches of growth in the lowest depths, the agave, and other plants and flowers that we find only in semi-tropical climates here grow profusely.

Indian Garden. Another difference between the "above" and the "below" is found in the fact that a garden is almost unknown on the rim, and that there are many down below. On the Bright Angel Trail is the Indian Garden, where, for many years, the Havasupais used to cultivate their corn, beans, onions and melons. Along the Shinumo, on the north side, Mr. Bass has a garden where all these things grow; where peaches, plums, grapes, and apricots have thriven abundantly, and where now he is planting figs, lemons, oranges and grape-fruit. The Havasupais, in the depths of their Canyon, grow the finest, largest and most tender corn in the world, peaches and figs galore, and all the ordinary vegetables. Boucher also has fruit and vegetables on the level near the river, on his trail. At Lee's Ferry also, Elder Emet has his gardens and orchards, as well as fine alfalfa fields. Nothing is more delightful than to come, after a hot journey down the trail, to these unexpected oases in the heart of the canyons.

Soil on the River and in the Canyon. The soil of the "above," too, largely differs from the soil of the "below." On the plateaus above, there are millions of acres, most of which careful examination shows to be covered with disintegrated rock and comparatively little vegetable soil, except below the surface. The winds and rains have carried away the softer and lighter soil, and allowed the heavier and harder rocks to remain. This process goes on all the time. In the depths of the Canyon, however, except on the steeper slopes, the soil remains.

The Silence on the Rim. A remarkable contrast between the rim and the Canyon is sometimes found in the absolute silence above, and the roar of the river below. It often occurs that not a sound of any kind can be heard on the rim but one's breathing and the beating of his own heart. One morning I lay for an hour before I arose, and during the whole of that time, though I listened again and again, not the slightest sound reached my ears save the two named.

Song of the River. Now descend to the river and, day or night, early or late, June or December, hot or cold, wet or dry, fair or stormy, the roar and rush, fret and fume of the water is never out of one's ears. Even when asleep it seems to "seep" in through the benumbed senses, and tell of its never-ending flow. After a few weeks of it, one comes away and finds he cannot sleep. He misses it and finds himself unable to sleep away from the accustomed noise.

The Wind. In nothing is the difference of "above" and "below" more marked than in the wind. Last night on the rim the wind blew almost a gale. The pines sang loudly, and one could hear their roar for miles. A dozen times I awoke and listened to their weird music. If you go outdoors, the wind plays with your hair, and tosses garments to and fro with frolicsome glee, or even, at times, with apparent angry fury. There are times when the wind comes toward you, on the rim, with a rapidity and force that are startling. Every one has had the experience of hearing a military band approaching from a distance.

As it comes nearer, the sound grows louder and louder, and if it approaches with great rapidity, as for instance, in an automobile or a speeding electric car, the music assails the ear with an increasing

force that is a surprise. It is just so with the noises of the wind at the rim of the Canyon.

Now leave the rim and walk down the trail a couple of rods. All is quiet and still. The change is startling m its suddenness. The wind may be blowing far above you, and if you listen, you will hear its effect in the trees, but here, where you stand, you are protected and sheltered.

Diversity of Color. Perhaps the greatest difference between the rim and the interior of the Canyon is found in the diversity in color and feature between them. While there is a fascination to the long, wide stretches of plateau on the rim, and the forest has its attractive points, there are not many prominent features (looking away from the Canyon) that would occupy the attention of travellers. There is little striking in color, in scenery, in rocky contour. Plains, trees, sky, clouds, sunset,—and nearly all is said. But immediately one stands on the rim and looks below, all is changed. Here is feature after feature that compels not only attention but reverent homage. Color such as is seen nowhere else in the world on such a grand scale; massive walls that have no counterpart; rock forms that dazzle and bewilder; and an unfoldment of the stone book of creation that is alike a joy and a pain, a delight and a sorrow, a something seen at a glance, and that requires a lifetime to comprehend.

CHAPTER XV. The Hopi House

The Harvey Collection at El Tovar. In the Hopi House, opposite the El Tovar entrance, is installed one of the most interesting Indian collections of the world,—a collection that would grace the National Museum of Great Britain, France or Germany. The more intelligent the visitor to the Grand Canyon, the more he will find he can learn in this wonderful storehouse provided for his instruction and recreation.

The Hopi House. The building itself is a perfect model of a block in the village of Oraibi, one of the seven Hopi pueblos. It is three stories high, and contains many rooms. The original is supposed to accommodate forty-five families. It is built of the chips of sandstone and other rock in accordance with Hopi custom, rudely and irregularly laid in mortar. It is of the terraced style of architecture, each story receding from the one below it, so that the "second story front" finds a ready courtyard on the roof of the "first story front," and the "third story front" on that of the "second story front."

Houses that were Forts. In the old houses, found when the white man first visited the pueblos, there was no means of entrance to the first stories save by means of the ladders which stood outside against the walls, and thence through hatchways made in the roofs. This was for the purpose of defence against hostile tribes, who were constantly warring with these home-loving Indians in order that they might steal from them the fruits of their persistent labor and thrift. The ladder, during times of expected attack, could be lifted upon the second story, out of reach, and thus these houses became the forts of their inhabitants. Nowadays entrances are provided on the ground floor, and this house at El Tovar follows the modern custom, as well as the later innovation (which of course is essential in this building) of using glass for windows. For convenience and safety, another anachronism is tolerated in the electric light. In practically everything else, the building is a true model of a Hopi community house. With these people, the women are generally and mainly the builders of the houses, the men merely assisting in the heavier work.

Quaint Stairways. In addition to the quaint ladders, quainter steps, cut into flat or round trunks of cottonwood trees, are used. Stone steps connecting the two upper stories, are also built outside in the partition walls. The chimneys are constructed, in true pueblo fashion, of pottery water ollas, the bottoms of which have been broken out. Three or more of these, fastened with cement or mortar, are placed one above another. On the roofs are wood piles, as at Oraibi, and also picturesque strings of red peppers drying in the sun.

Navaho Silversmith. The entrance doorway is low, and the steps lead one down into the first room, in true Oraibi style. This room is occupied by the Tinne peshlikai, or Navaho silversmith, and Navaho blanket weavers. The smith, though using some modern tools, still follows the time-honored methods of his brother craftsmen. The silverware he makes will be more fully described in the special chapter devoted to the subject, as will also the blanket weaving of his wife and children.

Details of Construction. In this room there are several features of interest. First notice the construction of the building. The roof is supported by a massive upright, in a crotch, or V, on which the cross rafters rest. Lesser poles are placed upon these at right angles, which in turn support arrow-weed, willows, and other light brush. In the genuine Hopi construction, mud is then plastered or laid thickly over these willows; but as these rooms contain valuable collections of goods, a modern roofing has been used, which, however, does not in any way detract from the "realness" of the building.

Fireplace. In the corner is one of the quaint hooded fireplaces, with the raised hearth, exactly similar

to several I have sat before in Oraibi, while my hospitable hostess prepared some Hopi delicacy or substantial food to tickle the palate or appease the hunger of her welcomed guest.

Mealing Stones. On the left is a quartet of corn-grinders, walled in from the floor by stone slabs laid in cement. In every pueblo house, a "battery" of these mealing stones is to be found, and it is one of the commonest of sights to find the women and girls on their knees, with the grinder in hands, rubbing it briskly up and down with the swing of the body, while every few moments, with a deft movement of the hand, the grain is thrown between the grinder and the stone beneath. The motion reminds one much of that required over the washing board. While thus at work, the Pueblo women sing some of their sweetest songs.

Hair Dressing. Occasionally when a Hopi mother, whose daughter has reached maidenhood, is located in the Hopi House, one may chance to find her engaged in turning the heavy black hair of her "mana" into the big whorls on the side of her head which are the Hopi emblem of maidenhood and purity. The mother herself wears her hair in two pendant rolls. These are the symbols of fruitfulness and chastity.

It is interesting also to see them make piki, a process elsewhere fully described.

Various Baskets. In the various rooms on the ground floor, the observing and curious will find quite a number of quaint architectural devices. The chief attractions to most visitors are the various Indian goods. There are baskets made by every Indian tribe in North America, Navaho wedding baskets made by Paiutes and used also by Apaches as medicine baskets; Havasupai, Pima, Hopi, and Katchina plaques; Hupa and Poma carrying baskets; Haida, Makah, Mescalero, Apache, Mission, Chimehuevi, Washoe, and a score of others. Here are pinion covered water-bottles of Navaho (tusjeh), Havasupai (esuwa), and Apache (tis-ii-lah-hah). Note the vast difference in the native names for practically the same thing.

Hopi Katchinas. The Hopi Ethnologic Collection (on second floor) is the best in the world, with the exception of the collection in the Field Columbian Museum, Chicago. In this collection are a large number of katchina dolls. Of these katchinas much might be written. They are ancient ancestral representatives of certain Hopi clans who, as spirits of the dead, are endowed with powers to aid the living members of the clan in material ways. The clans, therefore, pray to them that these material blessings may be given. "It is an almost universal idea of primitive man," says Fewkes, "that prayers should be addressed to personations of the beings worshipped. In the carrying out of this conception men personate the katchinas, wearing masks, and dressing in the costumes characteristic of these beings. These personations represent to the Hopi mind their idea of the appearance of these katchinas or clan ancients. The spirit beings represented in these personations appear at certain times in the pueblo, dancing before spectators, receiving prayer for needed blessings, as rain and good crops."

Powamu and Niman: The katchinas are supposed to come to the earth from the underworld in February and remain until July, when they say farewell. Hence there are two specific times which dramatically celebrate the arrival and departure of the katchinas. The former of these times is called by the Hopi Powamu, and the latter Niman. At these festivals, or merry dances, certain members of the participating clans wear masks representing the katchinas, hence katchina masks are often to be found in Hopi houses when one is privileged to see the treasures stored away. In order to instruct the children in the many katchinas of the Hopi pantheon, tihus, or dolls, are made in imitation of the ancestral supernal beings, and these quaint and curious toys are eagerly sought after by those interested in Indian life and thought. Dr. Fewkes has in his private collection over two hundred and fifty different katchina tihus, and in the Field Colombian Museum there is an even larger collection.

Katchina Baskets. For use in the katchina dances, katchina baskets are made, and if one were to start a collection of all the katchina baskets of the Hopi, he could look forward to possessing, in time, as large a number as Dr. Fewkes has of katchipa dolls.

Indian Pottery. Hopi, Acoma, Santa Clara, Zuni and, other pottery abounds side by side with Navaho blankets, war clubs, bridles, quirts, moccasins, Sioux beadwork, pouches, and baby-carrying baskets. Not only can the Navaho women be found weaving blankets, but, what comparatively few white persons have ever seen, in one of the rooms is a Hopi man weaving a blanket, which I question could be told from a Navaho, even by an expert, unless he saw it woven. In another room, the Hopi's wife is making pottery.

During the day, time, when required, the attendants will gladly show visitors the collection of rarer curios on the second floor. An anachronism introduced here, to meet modern requirements, is the indoor stairway, but one excuses it for the sake of the interesting, symbolic, katchina figures that have been painted on the staircase walls.

Mexican Antiques. Here one room is devoted to Mexican antiques,—candlesticks, crucifixes, paintings, tapestry, bells, incense-burners, wooden plow, a model of the ancient caretta, chairs, daggers, etc.

Alaska Room. The Alaska Room contains models of totem poles, carvings on ivory and wood, boats, snowshoes, shields, baskets of several varieties, Haida hats, etc.

Ancient Blankets. The Old Blanket Room contains an assortment of the rarer and older Navaho, Mexican and Chimillo blankets, some of which are in the exquisite old colors used before modern aniline dyes were known. Scattered about also are some rare pieces of ancient pottery in black and white, dug out from ruins in Arizona and New Mexico.

Hopi Altar Room. By far the most interesting room in the house to the thoughtful inquirer is the Hopi Altar Room. Here are two reproductions of altars made by the ethnologist, Rev. H. R. Voth, who was led to his study of the Hopi while a Mennonite missionary to the Oraibi pueblo. These altars are thus described by him:

Tao Altar. One of the fraternities among the Hopi Indians of Arizona is the Tao or Singer Society. Such altars are erected in connection with the sacred and secret ceremonies in underground rooms or kivas in the different Hopi villages. Around these altars the priests arrange themselves, squatting on the floor, during their ceremonies, and engage in singing, sprinkling of sacred meal, smoking, asperging of sacred water, etc. Here they prepare their prayer offerings, utter their prayers, and practise numerous other religious rites. Of the slabs and sticks in the ridge of the altar those of a zigzag form represent lightning, which is supposed to emanate from clouds, which are represented by the terraced parts on top of the slabs. The flat slabs symbolize stalks of corn, with ears of corn carved on them. The thin sticks are supposed to represent the departed members of the society. In front of the slabs are seen four bahos or prayer sticks, composed of two short sticks, a turkey feather, two kinds of herbs, and corn-husk pocket containing sacred meal and honey. The object to the right, and in front of the ridge, is the tipone or sacred badge of the society. It usually consists of an ear of corn, wound with cotton twine, and having on its top feathers of different birds; to its sides are tied sundry pieces of shell, turquoise, and other objects.

In front of the altar stands a medicine bowl, which is surrounded by six ears of corn,—a yellow one on the north side, a dark bluish one on the west side, a red one south, a white one east, a black one on the northeast (representing above), and sweet corn ear on the southwest (representing below). From this bowl, sacred water is asperged, and from a meal tray sacred meal is sprinkled on the altar during ceremonies.

Powamu Altar. In the centre of the Powamu Altar is the framework. The four scenic circles on and over the head-piece represent clouds, and the symbol on the uprights blossoms, clouds, falling rain, etc. The larger of the idols within the framework represents Chowilawn, the God of Germination and Growth, the smaller one, Sotukonangwun, the God of Thunder, and the small, black figurine to the left of the framework is the representation of Pookong, the God of War. Between these idols stand numerous slabs, the zigzag formed representing lightning, the straight ones stalks of corn, etc. On each side of the altar proper stands a large wooden tablet, on which is drawn a picture of the Hiv Katchina, a personage that figures conspicuously in the ceremony on the sixth day, in which children are initiated into the Katchina order. On this occasion masked and gorgeously dressed men, who are supposed to be represented by these pictures, flog these small candidates for initiation.

In front of the altar may be seen a square, sand picture, containing cloud symbols, prayer offerings, blossoms, etc. Between this sand mosaic and the altar proper are rattles, a medicine bowl, ears of corn, meal trays, eagle feathers, and other objects.

The large object at the extreme left, consisting of a terraced tablet at the top, several zigzag sticks, and a stand at the bottom, represents clouds and lightning. The tablet and also the drawing in the upper part of it represent clouds, the crooked sticks lightning, and the two circular drawings, in the lower part of the tablet, symbolize blossoms. The small idol between two of the sticks is a figurine of Chowilawn.

The symbol to the right of the altar on the back wall, consisting of several semicircles, is that of towering rain clouds, with two rays of lightning emanating upward from it. The small, black lines on the lower border represent rain. To the left of the altar, on the same wall, appears the typical Hopi sun symbol, and on the left side wall that of the mythical water serpent, Balolookang. All of these wall pictures, however, are not an essential part of the altar.

This altar, like the one of the Tao Society, was reproduced by Mr. Voth. One of the subjects of his study was this altar and the various ceremonies connected with it, and while he was making these

studies he succeeded in obtaining the photographs, drawings, measurements, notes, etc., from which he reproduced this elaborate piece of sacred Hopi ceremonial paraphernalia.

Hopi Door. The door itself leading into this Altar Room is an interesting antique. It is a real Hopi door, brought from Oraibi, and supposed to be not less than one hundred and fifty years old. Its quaint method of swinging, the way it is put together and fastened with nothing but rawhide thongs, reveals, as few things could, the interesting inventions of necessity. Prior to their knowledge and use of doors, which they undoubtedly gained from the Mexicans, their doorways were closed by slabs of rock, as described in the chapter on "The First Discoverers and Inhabitants of the Grand Canyon." Those who have read that chapter will find many things of especial interest in this fascinating house.

Value of Hopi House. The Hopi House is in itself a liberal education in the customs, arts, history, mythology, religious ceremonials, and industries of not only one, but many tribes of Indians. It is not only a good business investment, but a place of benefit to which one should go prepared intelligently to study. Such an one will come away with a keen appreciation of the incomparable ethnological advantages this building affords him, and he will not grudge any purchase, however large, the attractiveness of the display has led him to indulge in.

Dances in the Hopi House. Every evening throughout the year, when a sufficient number of visitors are present to justify it, the Indians of the Hopi House give a few brief dances and songs, which faintly suggest the style of some of their more elaborate ceremonials.

CHAPTER XVI. Visiting Indians At El Tovar

It is seldom that the traveler will find less than three Indian tribes of distinct family represented at or near El Tovar. In the Hopi House, as is shown, there are Hopis and Navahos, and in their camp near by,there will generally be found a band of Havasupais from Havasu (Cataract) Canyon, making baskets or dressing buckskin.

To most people an Indian is an Indian, yet there is such a wonderful difference between these three peoples, in features, language, habits, religion, social customs and life, that a short comparison cannot fail to be of interest and profit.

The Hopi Indian. The Hopis belong to the people popularly spoken of as "pueblos," but this name signifies nothing more than town Indians, as distinguished from the nomad or wandering tribes. They belong to the great Shoshonean family, and are a short, stocky, gentle people, given to agriculture, sheep raising, basketry and pottery, and a little weaving and silver work.

The Navaho Race. The Navahos, on the other hand, are of Athabascan stock, coming from the north, and are blood brothers of the Tinnehs of Alaska, and the fierce and warlike Apaches of Southern Arizona. They are natural horsemen, raising great herds of their wiry, active, hardy ponies, as well as herds of sheep and goats. These are the chief industries of their men, and the women are the most skilled blanket-weavers in the world.

The Havasupais. The Havasupais are of still another stock. They belong to the Yuman family, and are kin to the Wallapais, the Mohaves, Yumas and Cocopahs of the Colorado River.

Comparison of Three Races. In appearance, the Hopi and Havasupai are more alike than either are like to the Navaho. As a rule, the Hopi is well built and stalwart, with the unmistakable Indian face, but with less coarse and sensual lips, higher and more intellectual brow, more alert and kindly eye, and stronger chin than the Havasupai. The lobes of the nostril are wide and flexible, showing the wonderful lung power of this great running people.

The Navaho shows, in the build of his flexible body, that he is a horseman, a rider. His face is one of the strongest of Indian types, and is distinctive and easily recognizable, as a rule. With high cheek bones, strong square jaws, flexible, thin lips, large, limpid eyes and expansive brows, the tribe shows a high order of intelligence, and while at rest, their faces are kindly and inviting. There is a flash in the eye when aroused that denotes great pride, absolute fearlessness and hatred of control. It is a race of warriors, a race that for two centuries harried the Spaniards as well as the gentle Hopi, whom they regarded as their legitimate prey.

Costumes of Hopi Men. In dress, these three peoples are distinctive, though in these days of part civilization and close contact with the whites, the true Indian costume is being discarded for the conventional dress of the latter. The Hopi men generally wear the true pueblo costume. In olden days, it was the buckskin shirt and trousers, with a blanket over all. Now, the trousers are generally of white calico, with a slit on the sides from the knee down. A calico shirt is worn. The stockings are of blue

wool, without feet. Moccasins, with a sole of thick rawhide and uppers of dressed buckskin, are worn. The invariable silk handkerchief, or red bandana "bands" surrounds the hair, which is cut long, generally long enough barely to reach the shoulders.

Costumes of Hopi Women. The women's native dress is most picturesque, and far more adhered to than that of the men. The main dress is a welt-woven blanket of deep blue, sometimes with slight red decoration, which is fastened over the left shoulder and down the left side. The right shoulder is left bare, unless, as invariably is the case with the Indians who associate much with the whites, a light calico shirt is worn under the dress. It reaches to below the knees, and is encircled around the waist by a broad home-woven sash, which is wrapped two or three times around the body, and has the end carelessly tucked in. The feet are covered with moccasins, to which are attached swathings of buckskin, which are wrapped around and around the legs, until they are as large as ordinary sized stovepipes. The hair is worn in peculiar fashion, that symbolizes the social condition of the wearer. At puberty a maiden is required by the inflexible rule of the tribe to dress her hair in two great whorls—one over each ear—called "nashmi." These are in imitation of the squash blossom, which is the Hopi symbol of maidenhood and purity. When she marries, she must change the fashion of dressing the hair into two pendant rolls, in imitation of the fruit of the squash, which is their emblem or symbol for matronhood and chastity.

Navaho Men's Costumes. The old time Navaho men wear the white calico trousers, slit up the side, and a shirt, either of colored calico or of some kind of velvet cloth. On the feet are moccasins, and the stockings are the same footless kind as worn by the Hopi, fastened below the knee with a wide garter. This is made in the same style as the sashes which the Hopi and Navaho women wear around their waists, but is neither so broad nor so long. The hair is either allowed to flow loosely over the shoulders, or is arranged in a kind of square knot at the back of the head. As a basis for this knot, a hairpin made of bone, from three to five inches long, smoothed almost flat, with beveled or rounded edges, and often rudely carved, is used. Around this knot a sash similar to a garter is generally wrapped to secure it. The universal bands is worn around the head to help bind the hair, and keep it away from the forehead.

Navaho Women's Costume. The women wear a brown, green, or red velvet shirt, with a "squaw dress" beautifully woven of deep blue cotton, with a conventionally designed red border. Around the waist the wide sash, before described, is wound. This dress is both skirt and waist, but of late years those women who live in or near our civilization discard their native dress, and wear a skirt of calico, with the velvet shirt.

The Havasupai Dress. The Havasupai men and women now wear as near the conventional dress of our race as their means will allow. When I first knew them, the men seldom wore more than a pair of moccasins and a breechcloth in summer, with buckskin shirt and trousers, and a Navaho blanket over the shoulders in winter. The conventional dress of the women at that time was a skirt made of shredded cedar bark, which was suspended from the waist to below the knees, without shirt or shirt-waist. In winter, a Navaho blanket was worn over the shoulders. Both men and women still wear the inevitable moccasins, though the "civilized" members of the tribe buy their shoes at the white man's store in Williams, Ash Fork or Seligman. The women generally bang their hair across, about the center of the forehead, and then allow the rest of the hair to hang loose. It is a great insult to a Havasupai woman to ask her to throw back her hair from her cheeks, and to do it oneself is a serious offense.

Language. In language, these people are as different one from another as are the Turks, the Esquimaux and the French. Even in the simplest words these differences are marked. Take a few comparisons. For good the Hopi says lolomai, the Navaho yatehay and the Havasupai harnegie. Bad in Hopi is ka-lolomai (not good), Navaho da shonda (of the evil one), Havasupai han-a-to-opo-gi.

CHAPTER XVII. The Navaho And Hopi Blanket Weavers

What a marvelous art is that of weaving, and how much the human race of today owes to the patient endeavors of the "little brown woman" of the past for the perfection to which she brought this,—one of the most primitive of the arts.

Blanketry was a necessary outcome of basketry. The use of flexible twigs for baskets readily suggested the use of pliable fibres for textiles; and there is little question that almost simultaneously with the first rude baskets the first textile fabrics made their appearance.

Whence the art had its origin we do not know. But it is a matter of record that in this country, three hundred and fifty years ago, when the Spanish first came into what is now United States territory, they found the art of weaving in a well advanced stage among the domestic and sedentary Pueblo Indians, and the wild and nomadic Navahos. Scientists who have given the question careful study, hold that the

cotton of these blankets was grown by these Arizona Indians from time immemorial, and they also used the tough fibres of the yucca and agave leaves and the hairs of various wild animals, either separately or with the cotton. Their processes of weaving were exactly the same then as they are today, there being but slight difference between the methods followed before the advent of the whites and afterward. Hence, in a study of the Indian blanket, as it is made today, we are approximately nearly to the pure aboriginal method of pre-Columbian times.

Archeologists and ethnologists generally assume that the art of weaving on the loom was learned by the Navahos from their Pueblo neighbors. All the facts in the case seem to bear out this supposition. Yet, as is well known, the Navahos are a part of the great Athabascan family, which has scattered, by separate migrations, from Alaska into California, Arizona and New Mexico. Many of the Alaskans are good weavers, and according to Navaho traditions, their ancestors, when they came into the country, wore blankets that were made of cedar bark and yucca fibre. Even in the Alaska (Thlinket) blankets, made today of the wool of the white mountain goat, cedar bark is twisted in with the wool of the warp. Why, then, should not the Navaho woman have brought the art of weaving, possibly in a very primitive stage, from her original Alaskan home? That her art, however, has been improved by her contact with the Pueblo and other Indians, there can be no question, and, if she had a crude loom, it was speedily replaced by the one so long used by the Pueblo. Where the Pueblo weaver gained her loom we do not know, whether from the tribes of the South or by her own invention. But in all practical ways the primitive loom was as complete and perfect at the time of the Spanish conquest as it is today.

Any loom, to be complete, must possess certain qualifications. As Dr. Mason has well said: "In any style of mechanical weaving, however simple or complex, even in darning, the following operations are performed: First, raising and lowering alternately different sets of warp filaments to form the 'sheds'; second, throwing the shuttle, or performing some operation that amounts to the same thing; third, after inserting the weft thread, driving it home, and adjusting it by means of the batten, be it the needle, the finger, the shuttle or a separate device."

Indian looms are made of four poles cut from trees that line the nearest stream or grow in the mountain forests. Two of these poles are forked for uprights, and the cross beams are lashed to them above and below. Sometimes the lower beam is dispensed with and wooden pegs driven into the earth instead. The warp is then arranged on beams lashed to the top and bottom of the frame by means of a rawhide or horse-hair riata. Our Western word lariat is merely a corruption of lariata. Thus the warp is made tight and is ready for the nimble fingers of the weaver. Her shuttles are pieces of smooth, round sticks upon the ends of which she winds yarn. Small balls of yarn are frequently made to serve this purpose. By her side is a crude wooden comb with which she strikes a few stitches into place. When she wishes to wedge the yarn for a complete row—from side to side—she uses a flat broad stick, one edge of which is sharpened almost to knife-like keenness. This is called the "batten." With the design in her brain her busy and skilful fingers produce the pattern as she desires it, there being no sketch from which she may copy. In weaving a blanket of intricate pattern and many colors the weaver finds it easier to open the few warp threads needed with her fingers and then thrust between them the small balls of yarn, rather than bother with a shuttle, no matter how simple.

Before blankets can be made the wool must be cut from the sheep, cleaned, carded, spun and dyed. It is one of the interesting sights of the southwest region to see a flock of sheep and goats running together, watched over, perhaps, by a lad of ten or a dozen years, or by a woman who is ultimately to weave the fleeces they carry into substantial blankets. After the fleece has been sheared, the Navaho woman proceeds to wash it. Then it is combed with hand cards,—small flat implements with wire teeth, purchased from the traders. (These and the shears are the only modern implements used.) The dyeing is often done before the spinning but generally after. The spindle used is merely a slender stick thrust through a circular disc of wood. In spite of the fact that the Navahos have seen the spinning wheels in use by the Mexicans and Mormons, they have never cared either to make or adopt them. Their conservatism preserves the ancient, slow and laborious method. The Navahos live on a reservation which covers several hundred square miles, extending along the northern borders of New Mexico and Arizona where few travelers go. They do not live in villages or settlements and their homes are so scattered that one may travel a whole day without finding a woman at work with her loom. Day after day, however, one may see the carding, spinning and weaving processes in the Hopi House at El Tovar, where a little colony of Navahos is maintained.

Holding the spindle in the right hand, the point of the short end below the balancing disc resting on the ground and the long end on her knee, the spinner attaches the end of her staple close to the disc and then gives the spindle a rapid twirl. As it revolves she holds the yarn out so that it twists. As it tightens sufficiently she allows it to wrap on the spindle and repeats the operation until the spindle is full. The spinning is done loosely or tightly, according to the fineness of the weave required in the blanket.

The quality and value of a Navaho blanket is governed largely by the fineness of the weave. The yarn in some of the cheaper qualities now made is often coarse and loosely spun, and the warp, or chain, which has much to do with the life of a blanket, may be improperly spun and of uneven strength. A blanket of a given size may be made in two weeks, or in four, or in two months, according to the quality of the work and the skill of the weaver. Next in importance to the fineness of the weave is the proper blending of colors. Though a woman may have the highest skill in her primitive art, she must take time to study out the color scheme for her blanket. These are the principal factors, but there are others which enter into the making of a blanket, and the finer the product of the loom the more difficult the work becomes.

There are still a limited number of very fine blankets made. The number is governed largely by the demand.

In the original or natural colors there are white, brown, gray and black; the latter rather a grayish black, or better salt, as Mathews describes it, "rusty." Many of the best blankets now produced are of these natural colors, with sometimes a touch of red.

There are certain Navaho blankets much sought after by the collector, especially those rare old specimens made of purely native dye, the colors of which have softened into harmonious tones. These have not been made for many years past and most of the specimens in perfect state of preservation that are in existence were obtained from Mexican families where they had been handed down from generation to generation as heirlooms. Often in these old specimens the red figures were made of bayeta. As Mason says: "The word 'bayeta' is nothing but the simple Spanish for the English 'baize' and is spelled 'bayeta' and not 'ballets' or 'valets.'" Formerly bayeta was a regular article of commerce. It was generally sold by the rod and not by the pound. Now, however, the duty is so high that its importation is practically prohibited.

This bayeta or baize was unravelled and the Indian woman often retwisted the warp to make it firmer. She then rewove it into her incomparable blankets.

From the earliest days the Navahos have been expert dyers, their colors being black, brick-red, russet, blue, yellow, and a greenish yellow akin to an old gold shade.

There is abundant evidence that they formerly had a blue dye, but indigo, originally introduced probably by the Mexicans, has superceded this. If in former days they had a native blue or yellow they must of necessity have had a green. They now make green of their native yellow and indigo, the latter being the only imported dye stuff in use among them.

To make the black dye three ingredients were used: yellow ochre, pinion gum and the leaves and twigs of the aromatic sumac (thus aromatics). The ochre is pulverized and roasted until it becomes a light brown, when it is removed from the fire and mixed with an equal quantity of pinion gum. This mixture is then placed on the fire and as the roasting continues it first becomes mushy, then darker as it dries until nothing but a fine black powder remains. This powder is called "keyh-batch." In the meantime the sumac leaves and twigs are being boiled. Five or six hours are required to fully extract the juices. When both are cooled they are mixed and immediately a rich, bluish-black fluid called "ele-gee-batch" is formed.

For yellow dye the tops of a flowering weed (Bigelovia graveolens) are boiled for hours until the liquid assumes a deep yellow color. As soon as the extraction of color juices is complete the dyer takes some native alum (almogen) and heats it over the fire. When it becomes pasty she generally adds it to the boiling concoction, which slowly becomes of the required yellow color,—"kayel-soly-batch."

The brick red dye, "says-tozzie-batch," is extracted from the bark and the roots of the sumac, and ground alder bark, with the ashes of the juniper as a mordant. She now immerses the wool and allows it to remain in the dye for half an hour or an hour.

Whence come the designs incorporated by these simple weavers into their blankets, sashes and dresses? In this as in basketry and pottery, the answer is found in nature. Many of their textile designs suggest a derivation from basketry ornamentation, which originally came from nature. The angular, curveless figures of interlying plaits predominate and the principal subjects are the same—conventional devices representing clouds, stars, lightning, the rainbow, and emblems of the deities. These simple forms are produced in endless combination and often in brilliant, kaleidoscopic grouping, sometimes representing broad effects of scarlet, black, green, yellow, and blue upon scarlet, and the wide ranges of color skilfully blended upon a ground of white. The centre of the fabric is frequently occupied with tessellated or lozenge patterns of multicolored sides; or divided into panels of contrasting colors, in which different designs appear. Some display symmetric zigzags, converging and spreading throughout their length. In others bands of high color are defined by zones of neutral tints, or parted by thin, bright

lines into a checkered mosaic. In many only the most subdued shades appear. Fine effects are obtained by using a short gray wool in its natural state, to form the body of the fabric in solid color, upon which figures in black, white and red are introduced. Sometimes blankets are woven in narrow stripes of black and deep blue with borders relieved in tinted meanders along the sides and ends, or a central figure in the dark body with the design repeated in a diagonal panel at each corner.

The greatest charm of these primitive fabrics is the unrestrained freedom of the weaver in her treatment of primitive conventions. To the checkered emblem of the rainbow she adds sweeping rays of color, typifying sunbeams. Below the many angled cloud group she inserts random pencil lines of rain; or she often softens the rigid lines signifying lightning, with graceful interlacing and shaded tints. Not confining herself alone to these traditional devices, she often creates realistic figures of common objects such as her grass brush, wooden weaving fork, a stalk of corn, a bow, an arrow or a plume of feathers from a dancer's mask. Although the same characteristic styles of weaving and decoration are general, none of the larger designs are ever reproduced with exactness. Every fabric carries some distinct variation or suggestion of the occasion of its making.

Among the Navahos the women invariably do the weaving though in the past a few men were experts in the art. Among the Pueblo Indians the men perform this work. The products of the Pueblo looms are readily distinguishable from those of the Navahos, the latter having far out-distanced the Pueblos in the excellence of their work. Only among the Hopi, are blankets made that in any way resemble the work of the Navahos. Generally a Hopi man weaver can be found at work in the Hopi House, as well as Navaho women weavers.

The Hopi to this day preserve the custom of wearing a bridal costume completely woven out of cotton. After the wedding breakfast the groom's father "takes some native cotton and, running through the village, distributes it among the relations and friends of the family. They pick the seeds from the cotton and return it. A few days later a crier announces from the roof of a house that on a certain day the cotton for the bridal costume will be spun in the kivas." Here the friends assemble and "the rasping of the carding combs and the buzzing of the primitive spindles" are heard accompanied by singing, joking and laughing of the crowd. This cotton is then woven either by the bridegroom or his father or other male relation, into square blankets, one measuring about 60 by 72 inches, the other about 50 by 60 inches, also a sash with long knotted fringes at each end. When woven they are given a coating of wet kaolin, which adds to their whiteness.

This preparation of garments often takes several weeks, during which time the young married couple reside at the home of the groom's parents. Now the bride, with considerable simple ceremony, walks with one of the robes on, and the other in a reed wrapper, to her mother's house where, unless her husband has prepared a separate home for them, they continue to reside. In the Field Columbian Museum, Chicago, is a fine model showing the young bride wearing her new garment, going to her mother's home.

In their ceremonial dances, the Hopi women wear cotton blankets, highly embroidered at the sides and edges with red, green, and black wool. Fine specimens may be found in the Hopi House. Similar to these in style, though long and narrow in shape, are the ceremonial kilts or sashes of the men. In pictures showing the march of the Antelope Priests during the Hopi Snake Dance these beautiful sashes are well depicted.

In addition to the products of the vertical loom, the Navaho and Pueblo women weave a variety of smaller articles all of which are remarkable for their strength, durability and striking designs.

In weaving sashes, belts, hair bands, garters, etc., the weaver uses a "heddle frame" similar to those found in Europe and New England. None of these have been found in places that assure us of their use before the Spanish occupation, so we conclude that they were introduced by the conquistadores or the early colonists about 350 years ago.

The Thlinkets of Alaska, also, are good weavers. In the Fred Harvey collection in the Hopi House, El Tovar, and Albuquerque, the United States National Museum and the Museum of Princeton University, fine collections of their work are to be seen. These collections generally consist of cape and body blankets made of the wool of the white mountain-goat. The colors are white, black, blue and yellow. The black is a rich sepia, obtained from the devil-fish; the blue and yellow colors coming from two barks grown in the Alexandrian archipelago. The white is the native color and the fringe of both cape and blanket is undyed. To strengthen and give solidity to the garment, the fibrous bark of the yellow root is twisted into the warp.

CHAPTER XVIII. Pueblo And Navaho Pottery And Silverware

Primitive Processes. The primitive industries of a primitive people are always interesting to the student. They are more; they often reveal more than appears at first sight. We, with our present knowledge of improved mechanical methods, stand and watch an Indian silversmith or potter, and we laugh at the crudity of the methods employed, naturally comparing them with our own. But this is not the proper way to look upon the work of the aborigine. Rather let the gazer imagine himself without any of his advanced knowledge. Let him project himself into past ages, and find himself groping his way out of the darkness of primitive ignorance. He will find himself seeking for many centuries, ere he invents and discovers even the rude processes used today by the Indian. As an inventor, the aborigine has laid us under great obligation, for he discovered the first steps of mechanical progress, without which all later steps would have been impossible.

Hopi Pottery. In the Hopi House, the processes of making pottery and silverware by primitive methods may be seen in active operation, though in the manufacture of silver, some modern appliances have taken the place of the ancient ones. In the pottery, however, everything is exactly as it used to be before the white race appeared on the American continent. The Hopi woman brings her clay with her from some pit or quarry in Hopiland, where experience has demonstrated a good pottery clay is found.

After thoroughly washing, pulverizing and crushing, it is ready to be worked up into domestic and other utensils. Squatted upon the ground, the potter places in her lap a small basket, wood, or pottery base, upon which she places a "dab" of clay. This she thumbs and pats, until it forms the basis of the new vessel. Then another piece of clay is rapidly rolled between her hands, until it is in the form of along rope. This rope is then coiled around the edge of the base already made, pressed well into it and then smoothed down. After four or five coils of clay are thus added, the potter takes a small "spat," generally a piece of dried gourd skin, dips it into water, and proceeds to smooth out and make thin the clay coils. As quickly and dexterously as can be, her hands and the spat manipulate the vessel, until it has the desired shape. More coils of clay are then added, and the shaping continues until the vessel is complete. Now it is put out into the sun to dry, and when reasonably solid, it is ready for the painting and decoration. With a rude brush made of horsehair or yucca fibre, and paints gathered and ground by herself, she works out the design that her imagination has already created and pictured upon her piece of work. Some of these designs represent conventionalized objects of nature—birds, clouds, mountains, rain, corn, lightning, tadpoles, dragon-flies, horned toads, serpents and the like; others are purely geometrical, and the variety and extent of them are more wonderful than any except the experts realize. In a monograph upon the ancient pottery of these people, Dr. Fewkes pictures every known geometrical figure of ancient and modern times, all of which were copied by him from vessels that have been excavated from ancient ruins and graves.

The Pottery of Nampeyo. Every village has its own style of pottery. Among the Hopis, the finest potter is a resident of Tewa or Hano, Nampeyo by name. Her ware is characterized by beauty of shape, perfection of form, dignity and character in design, and a general appearance that is pleasing and artistic. Zuni pottery is of a superior quality to that of Acoma, Laguna, and the other villages near by, and often contains in its designs the deer, with its peculiar red line of throat leading to the heart.

Black Pottery. At Santa Domingo and Santa Clara, pueblos on the Rio Grande, a black ware is produced that is effective and strongly decorative in certain pieces.

Ancient Varieties. Ancient ware, dug from ruins and graves, is exceedingly rare and commands a high price. There are three distinguishable varieties, among others, that denote comparative age. The earliest type is of the corrugated ware, in which the thumb and finger marks, denoting the pressure of the coils, one upon another, are clearly in evidence. Some pottery was made in basket matrices, and marks of the basket are clearly outlined upon the outside of the vessels so made.

The second type is the plain black and white ware, and the third is the red ware painted with black designs.

Both ancient and modern ware, the latter in large variety, may be seen and purchased at the Hopi House.

Navaho Silverware. Of equal interest is the making of silverware by the Navaho peshlikai, or silversmith, whose primitive forge is in the first room entered at the Hopi House.

Fondness for Silver. The innate desire of a primitive people for personal adornment early led the pueblo Indians to a use of metal. When the Spaniards and Mexicans came among them, the iron, brass and copper of the conquerors were soon added to the dried seeds, shell beads, pieces of turquoise and coral they had hitherto used. But silver has ever been their favorite metallic ornament. Long ago they formed an ideal in the Spanish don or Mexican vaquero, with his personal apparel adorned with silver, his horse's bridle trapped out with silver belts, buckles and buttons, and his saddle and its equipment studded with silver nails and other fanciful expressions of adornment. From the Mexican and the

pueblo Indian he rapidly picked up the necessary knowledge, and practice soon gave the skill to fashion the silver into every desired shape.

Navahos Used Silver Three Centuries Ago. Cushing contends that the Zunis knew how to smelt metals before the Spanish conquest, but the statement is strongly disputed. There can be no question, however, but that the large use of silver ornaments by both pueblo and Navaho Indians dates from three hundred and fifty years ago, after Coronado's conquistadores had found out that this was no land of gold and precious metals, as was Peru.

In almost every pueblo of Arizona and New Mexico, and in many a Navaho hogan, one may find the primitive silversmith at work. There is no silversmith's shop, but generally in a corner of the quaint pueblo house, or in an adjunct to the Navaho hogan, the worker quietly pursues his important avocation; for in a community whose members have no other metallic arts, the silversmith is an important man, and sees to it that his profession is regarded with the high dignity it deserves.

Method of Working. With a rude mud forge,—the bellows of which, though primitive, is as ingenious as any patent bellows invented,—a hammer, a piece of railroad steel for an anvil, a three-cornered file, one or two punches, a crucible which he understands how to make as well as the best metallurgist in the land, and a bit of solder, he goes to work. Sometimes he runs his melted Mexican dollars into primitive moulds; again he hammers the metal into the shape he requires. He creates rings, some of them containing rude pieces of turquoise, garnet, etc., well designed bracelets, belt-disks, large and small silver buttons (some of which are admirably adapted for belt-buckles), earrings, necklaces, crosses, beads, bangles, clasps of silver for bridles, etc.

Ornaments and jewelry. The two most cherished objects are the waist-belt and the necklace, though far more rings and bracelets are to be found. But this is on account of the great expense of the former. The waist belts generally consist of eight moulded plates, either circular or oval, with filleted border and scalloped edges, each plate weighing from two to four ounces. These are punctured in the center, or a small band is soldered to the back, to admit of their being threaded upon a long and narrow belt of leather, the ends of which are fastened with a buckle. Both men and women wear these, and they are highly prized as ornaments by both sexes. The necklaces are equally in vogue, the designs being principally hollow beads, crosses, and ornaments representing pomegranate blossoms. The silver bridle is also an object of great esteem. It is made of curiously designed, heavy clasps of silver, fastened upon leather, with numberless buttons shaped from coins. Many of these weigh not less than fifteen ounces, and some as high as forty, hence their value can be readily estimated.

CHAPTER XIX. The Hopis And Their Snake Dance

A Hopi Religious Rite. Interesting among Indians, because of their unique houses on the summits of high mesas, reached only by precipitous trails, the Hopi of northern Arizona always have possessed peculiar fascination on account of their thrilling religious rite, known as the Snake Dance, an account of which follows.*

* This Sacred Dance and the life of the Hopi Indians is more fully set out in the author's larger work "The Indians of the Painted Desert Region".

The Painted Desert. The region they live in, named the Province of Tusayan by the Spanish conquistadores, three hundred and fifty years ago, is a region of color. The rocks of which the mesas are built, the sand of the desert, the peculiarly carved buttes which abound on every hand, are all strikingly colored, with such a variety of hues and tints that one does not wonder at the name—the Painted Desert—which is applied to the country through which we must travel to reach Hopiland.

A Saddle Trip from El Tovar. The traveler who wishes to visit this fascinating and unique region can arrange for full equipment at El Tovar. The trip will be a saddle one and all outfits will have to be transported on pack burros.

The Old Hopi Trail. The road followed is practically the line of the old Hopi trail. On the way out, the interested traveler may visit Grand View Point and Hotel, Hance's Old Camp and Trail, the Red Canyon Trail, Moran's, and all the other salient points at the eastern end of the Grand Canyon. Especially should he stand on faraway Navaho Point, or Desert View. This is the last of the promontories before the rim of the Canyon turns sharply to the north. Below it, a vast amphitheatre is opened out with more precipitous walls than at any other part of the Canyon. The sweep of the river, the mouth of Marble Canyon, the superlative richness of coloring at this point, combined with the unequalled views of the Painted Desert, which lies to the right, or east, afford a place of varied delight, scarce found elsewhere

on the whole Canyon rim.

Hopi Cornfields. Crossing the Little Colorado River at the Tanner Crossing, Moenkopi is visited, and then a day's ride of forty miles over the Painted Desert brings one to the cornfields of the Hopi, as properly they should be called. For years, they have been known as the Moki, a term of reproach applied in derision by the Navahos. These cornfields are a wonderful monument to the thrift of the Hopi. White men would have starved to death in the place, before they would have dreamed of planting corn in such an inhospitable-looking soil. No springs or streams sufficient to irrigate with, unversed in digging wells and pumping water to the surface, one would have thought an ignorant Indian would have looked elsewhere before planting his corn in such a place. But the Indian is not so ignorant. His life, from the cradle to the grave, is one of close observation. His very existence depends upon its exercise. He soon discovered, therefore, that there was a natural subsoil irrigation in certain parts of this desert, where his corn would grow. And grow it does, most wonderfully. Sometimes water is scarce; then the crop decreases, but generally a good crop may be relied upon. To hoe his cornfield, a Hopi will often run over the desert forty, fifty, sixty, and even eighty miles in a day. Sometimes, when the field is near by, the Hopi will ride on his burro. These cunning creatures are almost a necessity of Indian life. The streets would seem lonely without them. It will be noticed occasionally that one of these animals has lost part of his left ear. This is proof that he is possessed of kleptomaniac proclivities. If a burro is found stealing corn, he is sentenced to have part of his ear cut off.

Oraibi. On one of these burros we ride up the steep trail that brings us to the westernmost village of the Hopi, Oraibi. It is perched high on the mesa top, several hundred feet above the valley, and the various trails are steep and rugged. Some of them are sheer climbs, up which no animal other than man can go. There are six other villages, three of them ten miles, and the other three about twenty miles, to the east of Oraibi. They, also, are perched upon high mesas, which thrust themselves, like long fingers, into the sandy desert. On the middle mesa are Shungopavi, Mashongnovi and Shipaulovi, while on the eastern mesa are Walpi, Sichomovi and Hano.

Sandstone Houses. All the houses are built of rude pieces of sandstone, cemented with mud. Steps are made of larger slabs of stone, and often the only means of access is by long ladders, the poles of which tower high above the buildings, and give a singularly picturesque aspect to the village. In the olden days, there were neither doors nor windows in the first story of the houses. They were built so purposely, since they must serve for fortresses as well as homes.

Hopi Wafer. Bread. One is often likely to find a woman engaged in making piki. Piki is a wafer bread, peculiar to the Hopis. It is finer than the finest tortilla of the Mexican, or oatcake of the Scotch. No biscuit maker in America or England can make a cracker one-half so thin. The thinnest cracker is thick compared with piki, and yet the Hopi make it with marvelous dexterity. Cornmeal batter in a crude earthenware bowl, is the material; a smooth, flat stone, under which a brisk fire is kept burning, is the instrument; and the woman's quick fingers, spreading a thin layer of the batter over the stone, perform the operation. It looks so easy. A lady of one of my parties tried it once, and failed. My cook, a stalwart Kansas City man, knew he would not fail. And he didn't. He had four of the best-blistered fingers I have seen in a long time. But the Hopi woman merely greases the stone, dips her fingers into the batter, carries them lightly and carelessly over the heated surfaces, and, in a moment, strips the already baked sheet from the stone. When several are baked, she folds them over and over until they are about the size of an elongated shredded wheat biscuit.

Hopi Women as Builders. It is a reversal of our conception of things to see the "gentler sex " engaged in building a house, as is often the case in Hopiland. Yet to the Hopi there is nothing strange in this scene, for the woman, and not the man, is the owner of the house. Hence, the Hopi reasons, why should she not build it? It is hers, so let her make it; and she does. She uses no spirit-level, no plumb line, no square, no saw, and yet she makes a creditable house, fairly square and plumb, warm and cosy in winter, and cool and comfortable in summer. The mud of the winter's watercourses is used as mortar, and the pieces of disintegrated sandstone, that abound on the mesa tops, form the building material.

Men Who Weave and Knit. In accordance with Hopi logic, the antithesis of the woman house-builders is to be seen daily in the men who are engaged in weaving the women's garments; men, also, knit the stockings, and follow other so-called feminine occupations. There is nothing incongruous in these things to them. They are part of "the way of the old," handed down to them by their forefathers.

Hopi Method of Weaving. To watch a weaver at work is to acquire a new respect for Indians. As one sees the crude, home-made appliances, and then watches the yarn climb up, thread by thread, battened down by hand so that the garment will hold water, until the article is finished, artistically designed, and perfectly fitted for its required purpose, he comes to the conclusion that the Hopi weaver, at least, is a skilled artificer.

Hopi Rituals. The Hopi are a remarkably religious people. I question whether there is to be found

elsewhere in the world so ritualistic a people as they are. They have ceremonies—all of religious character for every month of the year, and some of them require from eight to sixteen days for their observance. Their dances are propitiations of the gods they worship, and whose aid they implore. One of the most noted and world-renowned of their ceremonies is the Snake Dance, and I wish to conclude this chapter with a brief description of this wonderful act, which I have now witnessed thirteen separate times. It has been woefully misrepresented by careless writers.

The whole ceremony is conducted with a dignity and solemnity that is not surpassed by any Christian observance.

Hopi Mythology Regarding Snake Dance. It is not a dance, in our sense of the word. It is a prayer for rain, and of thanksgiving for the blessings of harvest. Neither is it an act of snake worship. According to Hopi mythology, the snake and antelope clans, or families, are descended from the union of Tiyo and his brother with two sisters, daughters of the snake mother,—Tiyo being the paternal Ancestor of the Snake Clan, and his brother of the Antelope Clan. The story of Tiyo's visit, using a sealed-up hollow pinion log as a boat, and sailing down the Colorado river through " shipapu" to the underworld, is one of the most interesting pieces of aboriginal folk-lore. It appears elsewhere,* and forms the burden of the sixteen dramatic songs sung in the secrecy of the underground ceremonial kivas of the snake and antelope clans, in the nine days of preliminary ceremonial, which culminate in the open-air public dance.

* See Indians of the Pointed Desert Region.

Antelope Race and Corn Scramble. There are two other ceremonies connected with the Snake Dance that may be witnessed by all who like. These are the antelope race and the corn scramble. The former takes place on the morning of the eighth day before sunrise. Though apparently a mere test of athletic ability, it is in reality a religious ceremonial. For centuries, the Hopi lived surrounded by warlike people who preyed upon them. Being few in number, living in a desert land, and beset by murderous marauders, fleetness of foot and great "staying" powers while running over the long trails of the sandy deserts became an essential condition of national preservation. Hence the priests made the cultivation of the bodily powers a matter of religion. Every youth was compelled to exercise to the utmost. The result is a fine athletic development. Each year many great races are run, and two of the chief of these are at the Snake Dance, there being a race on both the eighth and ninth mornings.

At the end of that fierce race across the hot sands and up the steep mesa, the winner exultantly stands before the chief priests. The lightning bearer then throws the zigzag symbols over him, and rain clouds are pictured at his feet. Then he is hurried on to the antelope kiva, where another priest gives to him the sacred gourd full of water and a sack full of sacred meal, with certain ceremonial prayer sticks, which, placed and used in his cornfield, ensure to him an extra fine crop at the next harvest.

In the meantime, a number of young men and boys have followed the rest of the racers, bearing in their hands cornstalks, melon vines and fruit. As soon as they reach the level mesa top, the women and girls dart upon them, and a most good-natured but exciting scuffle takes place. For five to ten minutes this scramble lasts, and when every corn or vine carrier is rid of his gifts, the play is at an end, and all retire to await the great event of the whole ceremony,—the open-air dance, when the deadly reptiles are carried in the mouths of the priests.

Preparation for Snake Dance. At noon a secret ceremony takes place in the dark recesses of the kiva, viz.: the washing of the elder brothers (as the snakes are called), which I have fully described in "The Indians of the Painted Desert Region." When the afternoon shadows lengthen, every available place in the dance plaza is speedily occupied by the villagers and visitors, who wait the march of the antelope priests. The photographers present must keep within a certain line.

Arrival of Snake Priests. After circling in front of the kisi (a cottonwood bower in which the snakes are kept) the antelope priests line up with their faces fronting from the kisi. There they sing and dance awhile, waiting for the snake priests. These come from their kiva to the south of the dance plaza, and, as they arrive, all sounds are hushed and all attention concentrated upon them. They circle before the kisi, and then line up facing the antelope priests.

Appearance of Priests. Some people say they are hideous; others have said, with me, that the sight is sublime. If one looks merely at the half-nude bodies, made repulsive by a coating of reddish black paint, with dabs of whitewash in several places, at their faces painted with the reddish black stuff, at the strings of white beads around their necks, and the snake whips in their hands, then indeed it is easy to say that they are hideous. But if one looks at their faces, he will see intense earnestness, deep solemnity, profound dignity, and unflinching belief in the necessity for and power of the prayer about to be offered. Then, too, with what simple, trustful bravery they handle the snakes, when that part of the

ceremony comes! They know the danger; no one more so. Indeed, if a priest is afraid, he is not allowed to participate. Not only would his fear prevent his own proper worship, but it would interfere with that of his comrades.

Variety of Snakes. There were few snakes at Oraibi, the year I last saw the dance there, but those they had were active and vicious. There were several rattlers, some red racers, and a few bull snakes. The light was good, and several first-class photographs were made which actually show the snakes in the mouths of the priests. At the Snake Dance in the other villages, the priest swings the snake out of his mouth, and allows it to fall. Here, I noticed that every snake was gently placed upon the ground by the priest who had been carrying it in his mouth. The antelope men never leave their line, during the handling of the snakes. They continue to sing during the whole performance.

Purification of Priests. While waiting for the priests to return, after taking the snakes into the valley, I learned of several slight changes, owing to changed circumstances. The rain had made numerous small pools at the top of the mesa. The priests, in returning, divested themselves of all their ceremonial paraphernalia, and washed the paint from their bodies, before returning to the kiva and drinking the emetic. Generally, they have gone to their homes at Oraibi or at Walpi, have had the women bring water to the west side of the mesa, and there washed themselves.

CHAPTER XX. An Historic Trail Across The Grand Canyon Country

The Old Hopi Trail. One of the most noted aboriginal trails in the western United States, is the old Hopi (generally called Moki) trail, leading from the seven villages of the Hopi and their agricultural offshoot, Moenkopi, to the Canyon of the Havasupais. This was the trail followed by Lieut. Frank Hamilton Cushing—the noted ethnologist when he visited these Kuhne kiwes while he was living at the interesting pueblo of Zuni, in New Mexico. I have made the whole trip from Hopiland to the Havasupais and back twice, and have ridden for many years over small portions of the trail. It is intimately connected with the history of two of the people seen most at the Canyon. According to one of the Havasupai legends, the Hopis and Havasupais are descended from twin brothers. Hence they have always been friendly and have traded continuously the products of their own manufacture. The Hopis exchange their horses, sheep, and burros, laden with blankets, pottery and silverware, for buckskin, Havasupai baskets (which they prize very highly), dried peaches, etc.

Originally this was a foot trail; then horses, burros and mules were used; and now, in some portions of its distance, notably from Moenkopi to Oraibi, it is used for wagons.

A Six Day Journey. Let us leave the home of the Havasupais and go on a visit to the Hopis. Our trip into Havasu Canyon is described in another chapter. I discussed the matter with several of the leading Havasupais, and they told me that the trip will be arduous and long. How long? Five, six days!

A Side Trail. But before starting I decided to see one of the outlets to Havasu Canyon, that used to be a part of the old trail, and that was used as an inlet when General Crook and his soldiers came there. The trail is called after a spring bearing the name Pack-a-tha-true-ye-ba. Never did I have such a sense of the maze of canyons contained in this system of canyons as on that trip. My guide was Sinyela, one of the most intelligent Indians of the whole tribe. We left the Havasupai village early one morning, each riding an Indian pony, with all the provisions we thought we should need on our saddles. After awhile, we entered a side canyon I had never before explored. During the whole of that day we toiled, riding as hard as we could over the almost trackless canyon floor; trailing through deep sand; climbing over masses of boulders that freshets or cloud-bursts had. piled between the walls; forcing our way through dense willows; scratched by thickets of mesquites. Again and again in the walls were seen cliff-dwellings and corn storage houses. The heat was intense, and radiated from the precipitous walls on either side.

The Camp at Night. When night came, we ate our frugal meal, our horses standing by waiting to be hobbled and turned loose. For beds, we had the nearest layer of sand we could find, with our saddles for pillows.

Suffering from Thirst. Early in the morning we started again, winding and curving with the course of the Canyon. For nearly two days we had been without fresh water, and the little we had brought in our wicker-woven, pinion-gum-covered esuwas had to suffice for our needs. Suddenly we entered a vast amphitheatre, with a rude arch at the end. It was flower-covered, with occasional trees, and here, hidden from any but the view of an Indian, was found a tiny spring of coolest, purest water. How we enjoyed it!

A Dangerous Slope. On the third day, we came to the place where the soldiers descended from the

plateau above into the depths of the Canyon. There was no well-defined trail, and the slope was steep enough to make one's flesh creep. The site was marked with disaster. Here a pack mule had slipped, fallen, and been dashed to pieces; there a man had fallen and been killed. It was a difficult descent, but nerve and pluck had accomplished it. Beyond was the Pack-a-tha-true-ye-ba Spring, and after seeing its water I determined that we must return.

Capturing Wild Ponies. On our way back, Sinyela made a proposition that, as our ponies were exceedingly weary, we catch some fresh ones of his, for this was his "stock range," and he knew where there were plenty of good animals. The horses were wild, as range horses generally are, but Sinyela was crafty. He knew of a blind ravine, or rocky pocket, into which we could drive the horses we needed, and to that end all our energies were directed. Darting back and forth to arrest the dodging and fleeing animals, we at length succeeded in "penning" about a dozen horses in the pocket. Then I watched Sinyela, hand extended, slowly and stealthily approach the pony he needed. Time and again, as he got nearer and nearer, all the time making a peculiar sissing sound, the horse would suddenly swing around and endeavor to dash away. But I was "guard of the gate," and it was my business to see that none of the band escaped. It took us fully two hours to catch the two horses. At last they were ours. Neither was well broken, though both had been ridden, and the first thing Sinyela did was to blindfold them. The saddles were removed from our jaded ponies, and placed upon the new ones. The starts of terror and anger showed what we had ahead of us. Bridles were adjusted, and then, with our fresh ponies still blindfolded, we sprang into our saddles. When our feet were firmly placed and all was ready, we lifted the blinds from the horses' eyes and then braced ourselves. Digging our heels into the ponies' sides, off we started, at a jerking, bounding, half-bucking pace. Shouting directions to each other, helter-skelter, over and around boulders, we dashed along as if we were after the hounds on a genuine old-fashioned fox-hunt. I suppose we kept it up a full hour, at topmost speed. The horses didn't want to stop, and Sinyela knew that the best way to break them was to let them have their own way. But before the day was over, the ponies were considerably tamed down, and it was a weary band that stopped for camp that night. The animals were duly hobbled and turned loose; I lit a camp fire, though we had nothing to cook and no kettle for boiling water, and dirty, dusty, with every nerve and fibre of my body weary and aching, I finally stretched out on the solid earth and wooed "balmy sleep." The ride was resumed next day. We finally got ourselves to Sinyela's camp in safety, where a sweat-bath and a swim in the delicious waters of Havasu fully rested us.

The Hopi Trail Ascent. We decided to leave Havasu Canyon by way of the "Make" Trail. This is the same trail as that described in the chapter on the descent into Havasu Canyon from El Tovar, as far up as the point where the pictured rocks appear. Here the Hopi trail turns and follows the course of the main Havasu Canyon. Cushing counted forty-four knots in his buckskin fringe from the village to the exit, each knot denoting an abrupt curve or angle in the winding canyons. The Topocobya Trail descends a sheer cliff of stupendous majesty, and the Wallapai Trail is enough to shatter the nervous system of any but the most experienced; but the Hopi Trail ascent out of the Canyon is different, in that, in several places, it passes through narrow clefts, with ponderous, overhanging rocks, the whole course barely wide enough to permit a laden mule to get through with its pack. It is an almost vertical ascent of about twelve hundred feet which winds around and up the clefts, up steps hacked out of the solid rock with flint axes and hammers, by the patient hands of long-dead Indians.

The Legend of Ahaiuta. The Hopis and the Zunis believe this to be the spot where the Zuni god; Ahaiuta, one of the twin gods of war, after the waters of the world had arisen and overwhelmed the nations of their ancestry, and flooded the whole earth from the far west to the Rio Grande, dug a little outlet for the waters. The flood, finding this hole, had rushed down into the interior of the earth, and had thus worn this terrific cleft, and the gorge below, leaving the marks of its strife upon the banded rocks which surrounded and hovered over us.

Now we scrambled over great rocks, then along a foot-wide trail, and at length wound our way out along a massive bank of talus. Around at the head of the trail, I sent Sinyela back, and started alone along the historic trail across the plateau. The general scenery of the plateau already has been described.

A Roundabout Drive. At this point, I prevailed upon Mr. Bass to hitch two horses and two mules to his ambulance (which had once been a United States Army ambulance and was used in his Arizona campaigns by General Nelson A. Miles), and drive—a roundabout way to the northeastern slopes of the San Francisco range, thence to the Little Colorado River, where we would again strike the Hopi trail from Moenkopi to Oraibi. There were four of us in the party. From the rim of the Canyon direct to the Little Colorado the route is, at present, inaccessible for wagons. It is a horse trail, and somewhat of the same nature as all the plateau trails through the Kohonino (Coconino) Forest. Hence our roundabout wagon trip.

On the Fringe of the Painted Desert. Filling our canteens to the nozzle, we drove over the western

fringe of the Painted Desert. Skirting the mountain, we made a "dry camp" that night, and used up every drop of water next morning. Some went for our coffee, and the rest was given to the animals. Then we started for the far-away Tanner Crossing of the Little Colorado, across the thirsty desert. As we were without water, it was natural that, on that particular day, the elements should combine to make it hotter than usual. A few clouds sprang into existence, but we felt no breath of cooling air, and as the day grew, the clouds became burning glasses to focus the sun's heat more powerfully upon us. Late in the afternoon, our eyes were delighted with the sight of what seemed to be a pool of water, in the road ahead of us. Parched almost to keen suffering, we drove our weary and thirsty horses right into it, scaring away, as we did so, several horses that were standing there, and then, not waiting for cups or ceremony, each man threw himself flat on his stomach and began to drink the uninviting compound. A heavy shower had fallen in this one spot, and the pool had not yet had time to evaporate.

A Dash Across the Little Colorado. The day was sultry and betokened a heavy rain storm, so, when we reached the Little Colorado, we decided to get over that night, since, if the storm came, it might render crossing impossible. Our ambulance was heavily laden, and the crossing dangerous. Before I ventured, we unloaded about half the weight, and then I undressed, save for my undershirt, and went to investigate the bed of the crossing for quicksands. As soon as I had determined where to drive, we started across.

Whipping up the mules, and keeping their necks well into their collars, we dashed across in safety. Immediately the wagon was unloaded, I turned it around and crossed alone. The remainder of the load was put in, with our two men, and, one of them seated by my side with the whip, we "yelled" ourselves across again. Our wagon was stopped in a sandy drift, our grub box thrown out, a fire lighted, and with the impending storm in close proximity, we hurriedly cooked and ate our evening meal. No sooner was my plate cleared than, taking my roll of blankets, I wearily threw them down not more than ten feet from the wagon, too utterly "played out" to seek shelter in the cliff beyond, where a number of cave-like shelves afforded good level sleeping places, secure from the storm. As I unrolled my blankets, I called to the men to be sure to put out the camp fire and place the sugar sack, etc., in the grub box and close the lid. I was no sooner stretched out than I was sound asleep.

A Storm at Night. One of my companions insisted upon unrolling his blankets close to me, in spite of the fact that a terrible storm might break over us at any time. Poor fellow! He had scarcely gotten to sleep when a frightful gust of wind swept down upon us. Awakened with the noise, my eye caught a glimpse of the flaming brands from the fire being tossed into the wagon, and I rushed to the rescue. In a fierce wind, with a wagon and its contents dried out by the fierce Arizona sun, I knew there was not a moment to lose. Fortunately, I had left a pail, of water close by, and with this I doused out not only the flames in the wagon, but the remnant of the camp fire. It was pitch dark by now. All at once, with a light that was blinding in its intensity, and with a terrible clap of thunder, the storm burst upon us. It was, without any question, one of the fiercest short storms, accompanied with the most vivid lightning, I have ever seen. The darkness was so black, that, like that of Egypt during the plague, it seemed almost as if it might be felt. With a suddenness that was awe-inspiring, it became light as noonday. The lightning was of a brilliant, violet tint, and shone with fervent intensity. And it was not merely a few flashes. It came down in millions of jagged streaks, completely filling the heavens to the horizon in every direction.

A Frightened Traveler. In one of these blinding flashes, I caught sight of my neighbor. His face wore an expression of anguish. In his dread he had arisen, and had tried to pick up his clothes and blankets, in the hope of reaching shelter. In one of the sudden lulls of the tempest, I heard him talking to himself: "Shall I ever live through this awful night? Can I get to those cliffs? Why doesn't some one come to help me? I'm going to die. There's no help for it!" Taking advantage of the next flash, I picked up my blankets and carried them to the cliffs; then returned to him, gathered up his belongings, and urged him to follow me. As soon as he was secure, I spread out my sopping wet blankets in the first space I could find. Wet through as I was, I rolled myself up in my wetter blankets, and soon should have been asleep, had it not been for the moanings of the man I had rescued. He wished he hadn't come; he was sure the exposure would kill him, and he wondered why people were such fools as to take unnecessary trips. Just then the storm waters from above, seeking their accustomed drainage channels, found their way down to a rock which overhung my sleeping-place as a rude spout, and began to pour upon me in bucketfuls. Yet I vowed I would never admit that my sleep was in the slightest disturbed. So I turned over in my watery bed, and kept up the play until morning came, while the angry man complained the entire time. Funny? In spite of my own misery, it was funny enough to make a burro laugh.

Two Days' Rest. It took us a couple of days to get well dried out, which we spent at Tuba City, a Mormon town since abandoned by order of the Courts, which found that it was illegally located on an Indian reserve. Then we enjoyed a day or two at Moenkopi, watching the Hopi Indians at their interesting occupations, caring for their fields, and preparing to go on to Oraibi, forty miles distant, where the Snake Dance was soon to occur.

Camp at Blue Canyon. The heat was fearful—it was the middle of August -and the sand made hard pulling for the horses. It was late in the evening before we reached Blue Canyon. The road was uncertain, so we camped on the rim above, leading our animals down, as best we could, to a Navaho hogan, where we thought we might get water and some cornstalks for them. We got both, and then decided to hobble the animals and turn them loose in the Canyon, while we returned to our wagon above. The wind had come up, and was blowing fiercely, so, in the dark, I chose for a sleeping place a piece of ground that was somewhat sheltered from it. It was irregular, rocky and rolling, and as the wind continued to blow, the fine sand blew over and on to my face, while the coarser sand settled into my blankets. It was not a refreshing and comforting night.

An Exciting Descent. In the morning, when we went down for our animals, we found that they had broken through the flimsy fence of the Navaho, and had worked considerable havoc in his corn-patch. The Navaho grumbled and gesticulated, and showed unmistakable anger, but I took the matter coolly and, after seeing the extent of the damage, quietly asked the head of the family: "Tu-kwe peso?" (How many dollars?) On receiving his answer, I offered to give him sugar and flour to that amount. We became friends at once, and he invited us to bring our wagon down and spend the day with him. As we were all wearied, we decided to do so. To save going around by the wagon road, he showed us a quicker way of descent. It was a sand bank not quite vertical, but as nearly so as ever any one drove down and lived to tell the tale. So, harnessing the animals, we brought the wagon to the edge of this sandy descent; then, tying all the wheels securely, so that they would drag, all of us holding on to the hind axle and with weights trailing behind, the whole mass went over. Though we threw ourselves into the sand and held on to our ropes, it was only by expert driving that the animals were kept from being crushed.

Experience with a Navaho Pilot. The next day we pushed on to Oraibi, piloted by a Navaho. When we reached the western side of the mesa, I decided to go up the foot trail directly to the village, so as to have water and corn fodder awaiting the animals, when they got safely around to the eastern side. The Navaho got it into his head that the wagon was to be driven up the slope on to the mesa, an impossible thing without making a road. There was a trail for horses and burros, however, and the driver yielded to the Navaho's guidance. At last a sheer cliff was reached, up which only trail stock could possibly go. There the party was, with four saddle animals harnessed to a wagon, in a cul de sac, consisting of a spot barely large enough for the wagon to stand on, a deep precipice on the right, a steep cliff ascending on the left, and the animals ahead on a sandy slope as steep as the one we had descended at Blue Canyon, a day or two before. Fearful for the safety of animals and wagon, the only course was retreat. A crude road was built, and, after tying wheels and trailing ropes on as before, with the help of a number of Indians who had come to look on, the whole outfit was lowered to the level below in safety.

An Unforgetable Memory. Thus we had come over a large part of the historic Hopi trail, never designed or planned for a wagon, with our ambulance; and the memories of the trip, arduous though it was, linger in the mind, side by side with experiences of the Snake Dance, and other unforgettable and delightful remembrances.

CHAPTER XXI. The Navaho And His Desert Home

The Navaho Reservation. To see the Navaho in the Hopi House making silverware, or watch his wife weaving blankets, is one thing. To see him on his native heath in the heart of the Painted Desert—is another. With the conveniences of travel now made possible by the excellent equipments of the El Tovar transportation department, any visitor who is not afraid of a strenuous trip may now visit these people with the minimum of discomfort. Indeed, the Navahos and Hopis may be seen together, on the one excursion described in an earlier chapter. The Navahos are the warlike nomads of the desert. They occupy an extensive reservation in northern Arizona and New Mexico, that adjoins the Hopi reservation on the north and east. They now number some twenty thousand souls, and are slowly on the increase. They are proud, independent, and desirous of being left alone by the United States Government.

Punishment for Depredations. In the early days, before they had learned the power of the new people who had flocked into the land, they committed many depredations upon Americans, and when remonstrated with were insolent and defiant. So an expedition was sent against them, and large numbers—the major portion of the tribe were arrested and moved near Fort Bayard—the Bosque Redondo—in New Mexico, on the Pecos River. Here the conditions were so adverse that many scores of them died, and when, finally, they were allowed to return, it was an humbled people that wended its way back to the high mesa lands they had for so many centuries called their own.

Navaho Customs. Linguistically, the Navaho is akin to the Apache and the Tinneh of Alaska; indeed, he calls himself Tinne. In winter he lives in a rude shelter of logs and mud called a hogan. In summer

this is changed for a simple brush stack, which affords shade from the sun, and yet allows free course of the cooling air. He is a polygamist, and lives with his one or more wives, as he can afford. His chief industries are cattle, horse and sheep-raising. The latter supply his wife (or wives) with the wool needed for blanket-weaving, which is her chief industry.

Navaho Superstition. The Navaho is superstitious about several things: If any one dies in the hogan it is henceforth "tabu." The body is burned and the building with it, and whatever fragments of poles, etc., withstand the fire are regarded with distrust.

Dislikes and Fears. Another tabu of the Navaho is his fear of seeing his mother-in-law. Whenever she comes in sight, he disappears. Technically he never sees her, and I have often had great fun in trying to bring them together. Fish is another object placed under the Navaho ban. He will neither eat, see, nor smell fish, if he can help it.

Essentially Religious. He is an essentially religious being, and has a large number of ritualistic ceremonies. He has many dances for various purposes, the most exciting of which is locally known as the HoshKon. It is a healing ceremony. Dr. Matthews calls it the Mountain Chant. It requires many days for its complete performance, and one of its final ceremonies consists of a wild fire dance which is thrilling in the extreme.

Superior Horsemanship. But perhaps it is in his every-day horsemanship that the Navaho shows himself the superior man. Oftentimes he introduces feats of skill on a horse into his ceremonies. A few years ago at Tuba City, I saw a large band of Navahos unite with the Hopis in their dances and ceremonies of harvest thanksgiving. The Hopi director of the dances was Mootchka, whose costume was as astoundingly frightful as he could possibly make it. His naked body was smeared over with whitewash, some of which adhered and some of which did not. On his head was a mass of rudely woven black wool, crowned with the duplex pads of some wild flower. Around the waist was a similar black wool mat, fastened on with a Navaho belt of silver disks. When all was ready the dancers began. The trader's store-yard was the plaza, and the roofs of all the buildings on the three sides of the square were covered with Navaho spectators. Hour after hour they continued. Some of the dancers were decorated, others were in ordinary costume, but all danced and sang with fervor.

Dancing. The chief instrument was a large drum, made by hollowing out a section of a tree trunk, and covering the ends with rawhide, which were tightly laced on with strips of the same material. The dull monotonous thump of the drum kept time, while dancers sang and rattled. Their songs are invocations to "Those Above" to continue their good gifts, and at the same time accept thanks for all that had been given. One dance was particularly beautiful. It was supposed to represent the movements of the planets in and out of the fixed stars. Two little girls, brightly and beautifully dressed, waving feather plumes in their hands, threaded their way in and out of the lines of the dancers, themselves moving with an easy graceful swing.

Origin of Dances. To seek to penetrate the origin of these dances is to find ourselves in the darkness of antiquity. Almost all Indian peoples have the firmly fixed notion that the gods can be propitiated only by these exhausting dances. Consequently they are not performed by a few professional dancers, or even by certain families; all the people must dance. The smallest child, as soon as he is able to understand, must take his place with the elders, and the women and girls enter into the dances with the same religious fervor and zeal that is displayed by the men. And there is none of that sex enjoyment injected into their sacred dances, as there is in the white man's pleasure dances. The Indian men dance together, and the Indian women together, or, where both sexes participate, men are in one row and women in another. So that Indian dances are not pleasure dances. Neither are they competitive. There is none of the negro cake-walk idea connected with them, nor the Italian peasant's carnival, where rivals dance to gain the applause of the village.

Gifts Thrown to Spectators. During these dances at Tuba, gifts of corn, squash, melons, flour, cloth of native texture, and loaves of unleavened bread were brought and given with accompanying prayers to Mootchka, the leader. Then, at certain times, these were thrown among the spectators and eagerly caught, for not only were the articles themselves to be desired, but there accompanied them the prayers of the original donors, which, in some subtle manner, were supposed to bring good fortune to the final recipients.

The "Rooster" Race. The next day the Navahos had their turn. The two leading chiefs selected a suitable site, and, taking a rooster, buried it up to the neck in sand. The running course was soon cleared, and excited Indians on horseback lined up on either side for half a mile. Horseflesh of all kinds known to the Indians (from fleet, wiry steeds that had won many a prize, to broken-down cayuses fit only for the boneyard) was to be seen. The riders were decked in all the gorgeousness they could afford. Silk bands were around jet black masses of hair; calico of rainbow colors was made into garments, here and there overshadowed by a beautifully woven and exquisitely patterned native

blanket. Around the waist of many of the men were leathern belts, to which were attached large silver disks worked by native silversmiths; and rings, bracelets, necklaces and earrings of similar work abounded.

Beginning of the Fun. The competitors were soon gathered together at one end of the course. The chiefs stated the conditions upon which the prizes must be won, and a signal was given. Like a shot, a rider darted out from the mass toward the tiny head of the buried rooster, stooping over from the saddle as he neared the bird, with fingers of the right hand extended, the left hand holding the bridle and clutching the horse's mane. With a sweep, sudden as it was delicate, he tried to catch the rooster's head between his extended fingers. He failed, but dashed on, for another horse and rider were at his heels, and another and another; the string seemed endless. Now and again one would touch the bird, or would actually catch the head, but the body was too securely buried to be pulled out easily. Cheers would ascend as the riders showed approximate success. Sometimes a horse would shy, and the white visitor looked for nothing less than a broken neck for his rider. But, laughing and shouting, the athletic and careless Indian would swing himself into the saddle, and in a few rough jerks teach the unruly animal to recognize a master. Of course, long before this, the rooster was dead, for at the first strong clutch his neck was broken, so that there was no unnecessary torture. The stream of riders flowed on, and at last one lucky fellow gave the right kind of a pull, and out came the rooster, to be swung around his head with a fierce yell of triumph.

Pursuit of the Victor. Now the real sport begins. With a shout that only Indian lungs can produce, every rider darts after the possessor of the rooster, and for an hour, more or less, it is a question of hard riding, dodging, evading, whirling to and fro. Over the sand-hills they go, pursued and pursuers, yelling and shouting like demons. The victor's horse seems to know all about the sport. He watches and dodges and doubles, like a hunted hare. Now a stalwart ruffian has caught the rooster carrier, and hangs on like grim death, while he is beaten over head and breast and shoulders with the rooster as a weapon. Others join in. Surely someone will get hurt! Watch the horses. They nip and pinch each other, and squeal with pain and anger. Ah, the winner still keeps his prize! Again he is caught, and this time it seems as if he must succumb. But his horse helps him out and, by clinging desperately to the horn of the saddle and his horse's mane, he wrests himself away from his pursuer, aided by the shying of the pursuing horse, which is kicked and bitten by his own animal. But where is the pursuer? His horse is dashing riderless away. Is he trampled to death in that swirling, sandy conflict? No, he is hanging on to the man with the rooster, belabored the while with the now bloody and dilapidated bird. Regardless of this he still clings, although the horse is bounding along at great speed, and a hundred or more are following, all yelling and encouraging him not to let go. With a superb effort, he swings himself onto the horse behind the saddle, and with a second sudden move grabs the rooster and wrests half of it out of the original victor's hands. Seeing a chance to escape he drops upon the sand, picks himself up unhurt, and is soon seated upon a new horse. Now he becomes the pursued, and two bands, instead of one, of howling, raving, shouting demons, occupy the attention.

Finish of Contest. And thus the struggle goes on, good-naturedly, yet with a fierceness of energy that is exhausting in its wild excitement; exhausting to the onlooker, as well as the participant. When the unlucky bird is all dismembered, and the racers smeared from head to heels with blood, and it seems impossible to divide the pieces any smaller, then, and not till then, the conflict ceases.

Two Thousand Horsemen. But for superb riding watch nearly two thousand of these sons of the desert as they train their young men and boys in daring control of their horses. The greatest chief of the Navahos is a good friend of mine, and it was by his kind invitation that I was privileged to see this never-to-be-forgotten sight. He commanded the "regiment"—shall I call it?—riding alongside at times, and again standing where he could signal his demands and note the result.

An Exhibition of Riding. Let us stand with him. These riders are about to dash past. Just before they reach us, a signal is given, and every rider, in an instant, disappears over the side of his mount, while the horses continue running under perfect control. Simultaneously, every Indian reappears upon his saddle, sits about as long as one might count three, and then slides over to our side of his horse, fully in our sight, holding on by stirrup and mane, but completely hidden from one who might be looking from the other side.

Wonderful Agility. The chief was delighted, in his dignified quiet way, as I burst into warm encomiums, and told me I should soon see "some more" riding. Again the horsemen dashed past. This

time I watched for their disappearance and saw where and how they went, but I was scarcely prepared to see many of them peeping at me from under the bellies of their animals. This was done several times; then Pacoda gave me another treat. The riders came toward us. At a sign, every man sprang from his horse to the ground, to our left, gave three or four wild jumps, sprang completely over the saddle to the other side of his horse, where he gave more jumps, and then, with a yell of joyful triumph, landed into his saddle, the horse, meanwhile, keeping up his speed.

An Impressive Spectacle. But to see the whole party ride furiously away from us, nothing but black hair, sturdy backs, horses' tails and hindquarters with galloping feet presented, and then, in the twinkle of an eye it almost seemed, to have the same party dashing towards you, was a feat in horsemanship which impressed me most profoundly.

Horsemen almost from Birth. It is not to be wondered at that the Navaho is an expert horseman. He is as nearly born on horseback, literally, as he can be, for on several occasions I have ridden with Navaho friends, among whom was an expectant mother, have stopped half an hour for the birth, and then, with the new-born babe strapped on the mother's back, have resumed the trip, completing, perhaps, forty or fifty miles in a day. Children born under such conditions could not fail to be skilful horsemen.

CHAPTER XXII. From El Tovar To The Havasupai Indians And Their Wonderful Cataract Canyon Homes

Havasu Canyon. The Grand Canyon has two important tributary canyons. The most important of these is the Havasu Chic-i-mi-mi (canyon of the blue water). This is where the Havasupai Indians live.

First White Visitor. The first white man to visit the Havasu, as far as we know, was Padre Francisco Garces, of whom I have written in another chapter. Four times he made long journeys into the interior, visiting a large number of Indian tribes. Among these were the Wallapais and the Havasupais.

Garces' Diary. Dr. Elliott Coues, who visited the Havasupais in 1881 with a governmental party, has translated Garces' diary, and it was published a short time ago by Francis P. Harper, of New York. In this translation, he describes the descent of his (Coues's) party into the Canyon, and his description is so vivid that it is well worth repetition here.

Dr. Coues' Description of Trail to Havasu Canyon. "On the 10th, a march of ten miles in the same direction brought us abruptly to the brink of the precipice—a sharp-edged jump-off of perhaps a thousand feet. There was no side canyon here for gradual descent; the firm level ground gave no hint of the break before us until we were actually upon the verge, and when the soldiers lined up to look down an involuntary murmur of astonishment ran through the ranks. Dismounting and going in single file, each man leading his horse, we took the dizzy trail—a narrow footpath, in many parts of which a misstep would have been destruction to man or beast. The way zigzagged at first for some distance, on the 'switchback' principle by which railroads sometimes make grades otherwise impracticable; the face of the precipice was so steep that, as we filed along, those of us at the head of the procession looked up to see the other sections of the train almost overhead; certainly a fall of any man there would have been right on top of us. Then the trail took a long lurch to the left with little descent, hugging the face of the cliff, and we looked like a row of ants on a wall. This brought us at length to the head of a great talus, down which the trail zigzagged—the incline was too steep for straight descent, probably at an angle of forty-five degrees. This fetched us into the bed of Cataract Canyon, perfectly dry. The trail was nearly a mile long, and it took us an hour to make our creepy way down. The Havasupai chief, who had been advised of our coming, was there to meet us with some of his men, all mounted; and he took us up the canyon about five miles to a place where there was a scanty aguage, not sufficing for the wants of the whole party. Next morning we retraced our steps down the canyon and kept on in its bed until we reached the wonderful blue spring above described and the wonderful rancheria of the Indians, a distance from last night's camp of about twenty-five miles, as we had struck the canyon some twenty miles above the living water."

Other Trails to the Canyon. Garces came into the canyon by another trail, entirely distinct from this, commonly known as the Wallapai Trail. He left Havasu Canyon by still another trail, known as the Moki Trail, which leads directly from this canyon to the home of the Hopis.

In 1857, Lieutenant Joseph C. Ives made the descent into Havasu Canyon down the Wallapai Trail. His account of the journey reads like a novel, and people who are unfamiliar with the wonderful engineering feats of the Havasu Indians can scarcely believe that Ives did not allow his imagination to run away with him, in his descriptions of the Havasupais' trails.

Later, Lieutenant Cushing, guided by his Indian friends, rode across country to the Hopis, and then secured a Hopi guide who took him to see the Havasupais over the Moki Trail. He confirms all that Ives and Coues have written of the astonishing character of these trails. Having been up and down these trails many times during the last dozen years, I can say without hesitation that there are no more startling trails to be found in our Southwest.

Trip from El Tovar. One of the most enjoyable of the more arduous trips taken by visitors to El Tovar is this trip to Havasu (Cataract) Canyon. Only those who enjoy a strenuous outing should arrange for this trip, and then plenty of time should be allowed to do it without too great rushing. The first portion, to the head of the Topocobya Trail, is generally done in a buckboard. The distance is thirty-five to forty miles, over a varying road,—good in places, fair in others, and wretchedly poor now and again. Arrived at the "hill-top," as the Indians call this point, the conveyance must be abandoned, and all the outfit for sleeping, cooking, and eating is transferred to the backs of pack animals, which have been sent on ahead. The visitors take saddle animals. There are those who make this drive, and then ride to the village, fifteen miles further down the trail, in one day. A better plan is either to make "dry camp" at the head of the Topocobya Trail; or, if time permits, descend to the Topocobya Spring, which flows out of the base of the immense cliff down which one fork of the trail descends. For there are now two ways of descending at Topocobya,—to the right or the left of a mountain which overlooks the Canyon. The trail by which I first entered Havasu Canyon is the one to the left, looking into the Canyon.

Topocobya Spring. Arrived at the spring, the stock can be watered, packs removed, beds unrolled, and camp made for the night. The water, however, is not of the best for drinking purposes, though the Indians habitually use it.

Pictographs. The following morning an early start may be made, and the winding course of Topocobya Canyon followed to its entrance into the main Havasu Canyon. Here a number of interesting pictographs may be seen on the wall to the left, reminding one somewhat of those found in Mallery Grotto at El Tovar.

Havasupai Gardens.* Except in the rainy season, the upper portions of the main Havasu Canyon and all its tributaries are dry and sandy. Just before one reaches the village, however, the barrenness disappears. A thousand springs appear, and unite to form a stream which, in less than a hundred yards, will measure from four to six feet deep and fully eight feet across. It is this stream that renders life possible for the Indians. For the distance of about two miles, the bed of the Canyon, which is here filled with sandy earth, is irrigated from this rapidly flowing stream. The result is that with comparatively little labor the Havasupais are able to produce excellent crops of corn, beans, chillis, onions, melons, squash and other vegetables. After the advent of the Spaniards, they obtained peach trees, and they now grow far more peaches than they can eat, drying large quantities, some of which they sell to ranchers, miners and other outsiders. They also have fine figs.

* Since this chapter was put into type, the Havasupai village has been swept nearly out of existence by a flood. The winter of agog-igto saw a large fall of snow on the plateau, which, melting suddenly during a hot spell in January, rushed down the Canyon in a body, destroyed the school, agent's house, and took away nearly all the hawas, fields, and orchards of the Indians. This catastrophe has several times occurred to them (according to their traditions), so there is little doubt but that they will ere long replant their cornfields and reestablish their homes in the spot they love so well.

The Havasupai "Hawa." The house of a Havasupai is called a "hawa." It is a primitive structure, generally built of cottonwood poles, willows and earth. Occasionally one of the leading men will put up a more pretentious home, whose sides will be of matted willows, plastered inside and out with mud, and with a mud-covered roof which will turn the rain.

A Basket-maker's Paradise. There are about thirty basket-makers among the Havasupais, and specimens of their work may be found in the Hopi House. As Havasu Creek is lined with willows that are admirably adapted for basket-making, and as an abundant supply of martynia, or cat's-claw, is found on the plateaus above, this Canyon is a veritable basket-makers' paradise. Their best work is done in the coiled stitch. The esuwas, or water-bottles, are made out of the twined weave, and then covered with pinion gum.

Beautiful Waterfalls. Havasu Canyon is interesting, not only on account of its Indians, but because of its narrow walls reaching up to the very heavens and shutting out the sun except for the midday hours, and the beautiful blue water flowing in its willow-fringed bed, which finally dashes in successive leaps into the lower depths, making several cataracts, one of which I regard as the most exquisite waterfall in the world. As a consequence, it is becoming a great attraction for travelers.

Bridal Veil Falls. There are five falls in all, occurring in the following order: Havasupai, Navaho, Bridal Veil, Mooney and Beaver. The last three are the most important. Bridal Veil is about one hundred

and seventy feet high, and five hundred feet broad, but this space is not entirely covered with water. The edge is so broken that the water dashes over the precipice in a large number of stream and falling upon several different ledges, is again broken into a dashing spray, which, light and feathery, again leaps into the air. The general effect is indescribably beautiful.

The visitor should not fail to cross the Creek either above or below the Bridal Veil Falls, for on the further side are a number of water concretions well worth seeing.

Mooney Falls. Mooney Falls, one mile farther down, is a much higher cataract, but the water falls in an undivided stream. It gets its name from an unfortunate miner, who, in trying to descend a rope ladder to the bottom of the falls, fell, and was dashed to pieces.

Beaver Falls. Beaver Falls are about four miles farther down the Canyon, and receive their name from the large number of beavers that used to be at work in the stream close by.

By recent survey of this region, it has been found that these falls are not included in the Havasupai reservation. It is to be hoped, however, that, before it is too late, this Canyon, its waterfalls and surroundings, will be made into a National Park, forever and inalienably to belong to the people.

CHAPTER XXIII. The First Discoverers And Inhabitants Of The Grand Canyon

A Barren Waste of Rock. While the Grand Canyon, its vast system of tributaries, and its plateau were being uplifted from the primeval ocean, it consisted of nothing but a wild, barren waste of rock. Not a tree, not a shrub, not a flower, not a blade of grass relieved the monotony of the wilderness of rocks which emerged from the great Eocene sea. Not a lizard, horned toad, centipede, tarantula, chuckwalla, campamouche,* frog, tree-toad, turtle or snake was to be found on the long stretching areas of its lifeless shores. Not a chipmunk, prairie-dog, coyote, rat, mouse, porcupine, fox, bear, mountain-lion, badger, deer, antelope or other four-footed creature ran over its new-born surfaces. The sun shone unhindered; the rain beat with pitiless fury; the winds swept unhampered; the snows piled up undeterred over the whole plateau and canyon country. It was plateau and canyon, canyon and plateau; red rock, gray rock, creamy rock, yellow, pink, blue, chocolate, carmine, crimson rock, soft rock, hard rock; sunshine, shadow, wind and quietude; winter, summer, autumn, spring-and that was all! A lifeless world, as yet unprepared for insect, reptile, beast, man, flower or tree. Perhaps a solitary sea-bird with strong pinion flew over it, and gazed into its lifeless depths with wonder, or a dove flew from some earlier and habitable land over this wonderful mass of rock, and returned to its nest and its mate. But no olive or other leaf was in its bill.

*An insect that looks like a tiny dried wisp of hay, well-known in Arizona.

And so the land was born, and rested; while silence, sunshine and solitude brooded over it.

Creation of Soil and Verdure. But in the course of ages, soil was created by the disintegration of the rocks by the weather and the atmosphere, seeds were blown in from regions where flowers and plants bloomed, or were carried in by birds, and later distributed by the four-footed creatures. Then verdure sprang into life; the gentle grasses and flowers began to cover the slopes and level places where soil had gathered, and the trees came to sway and swing in the breezes, and sing their songs of coming life to the hitherto barren rocks.

Fossils of Sea Creatures. Yet they had not been altogether lifeless. Many of the rocks had known life, but it was not insect, reptile, bird, beast or man life; neither did they known anything of grass, flower, shrub or tree life. In the far-away ages, when they were being deposited deep under the surface of the Eocene sea, they saw vast monsters floating in the salty deep, and later, fishes of all sizes, and even great beds of waving sea-moss and ferns floated back and forth, as the tides ebbed and flowed. And fishes and ferns, monsters and moss were occasionally caught in the flowing deposits of lime and sand and silt and clay, and were embedded in their mass. Thus imprisoned, their otherwise forgotten life and history is told to the ages of man that were as yet unborn.

Coming of Man. But now the new life is coming! With verdure and animal life in existence, these hitherto uninhabitable regions became capable of sustaining human life. And the restless spirit of the human race, wherever and howsoever it originated, drove bands of men and women into this region.

Who were they? What were they like? Whence did they come? How long did they stay? Whither did they go? are questions one naturally asks in regard to these first discoverers and inhabitants. If I were to say "I do not know," I would be saying what every other thinking man is compelled to say. Yet there is pleasure in conjecture.

Traces of Ruins. Before looking at these conjectures, however, it is appropriate that we look first at what facts there are to justify them. Suppositions without any facts are mere fictions of the imagination, and this we are not indulging in. When in our day men began to explore the Grand Canyon and its numberless tributaries, a great number of indications of man's presence were found on the rim, on the fault lines or breaks in the sheer precipitous walls, on the plateaus and in the Canyon beneath, in the shape of crude house ruins, lookout houses or forts, indifferent trails, cliff-dwellings, hewn-out water cisterns, mescal pits, with countless pieces of broken pottery, arrowheads, stone axes, hammers, mortars, pestles and even cemeteries. or places of cremation.

Evidences of Superior Civilization. Major J. W. Powell, in his journal of explorations, writes that when he and his party reached the mouth of the Uinta River, they went up to the agency of the Indians of the same name. While visiting the Indians, and noting their fertile, irrigated farms, he found many evidences that "this beautiful valley has been the home of a people of a higher grade of cultivation than the present Utes. On our way here yesterday, we discovered, in many places along the trail, fragments of pottery, and wandering about the little farms to-day I find the foundations of ancient houses and mealing stones that were not used by nomadic people, as they are too heavy to be transported by such tribes, and are deeply worn. The Indians, seeing that I am interested in these matters, take pains to show me several other places where these evidences remain, and tell me. that they know nothing about the people who formerly dwelt here. They further tell me that up in the Canyon the rocks are covered with pictures."

Ancient Dwellings. When Powell and his party reached the junction of the San Juan with the Colorado, they might have found a large number of ancient dwellings in the cliffs not far away from where Bluff City now stands.

Further on, when the Bright Angel was discovered (the beautiful stream and canyon on the north side of the Canyon directly opposite El Tovar), the story of which is told in a separate chapter, Major Powell went up a little gulch, just above Bright Angel Creek, about two hundred yards from their camp on the Colorado, and there he discovered the ruins of two or three old houses, which were originally of stone, laid in mortar. Only the foundations were left, but irregular blocks, of which the houses were constructed, were found lying scattered about. In one room he found an old mealing stone, deeply worn, as if it had been much used. A great deal of pottery was strewn around, and old trails, which in some places were deeply worn into the rocks, were seen.

Ruins of a Village. Between the foot of what is now the Bright Angel Trail and Bass's Cable Crossing, Major Powell discovered another group of ruins. "There was evidently quite a village on this rock. Again we find the mealing stones, and much broken pottery, and up in a little natural shelf in the rock, back of the ruins, we find a globular basket, that would hold perhaps a third of a bushel. It is badly broken, and, as I attempt to take it up, it falls to pieces. There are many beautiful flint chips, as if this had been the home of an old arrow-maker."

Old Gardens. Later, when white men began to go down the trail now known as the Bright Angel Trail (the one near to El Tovar), the remnants of gardens, with irrigating ditches, in which small pieces of Indian pottery were scattered about, were discovered. The place is known today as Indian Garden, and is seen from the upper porch of the hotel.

Stone Huts. In his account of Powell's second expedition, Dellenbaugh tells of ancient ruins found below Labyrinth Canyon. "Small huts for storage were found there in the cliffs, and on a promontory, about thirty feet above the water, were the ruins of stone buildings, one of which, twelve by twenty feet in dimensions, had walls still standing about six feet high. The Canyon here was some six hundred feet high, though the top of the plateau through which the Canyon is carved is at least fifteen hundred feet above the river. We discovered the trail by which the old Puebloans had made their way in and out. Where necessity called for it, poles and tree-trunks had been placed against the rocks to aid the climbers. Some of our party trusted themselves to these ancient ladders, and with the aid of a rope also, reached the summit." These Indians had tilled a small piece of arable land in an alcove near by.

An Old Indian Fortress. Hance found a number of cliff ruins and the remnants of old houses on and near his trail, and on the Red Canyon Trail. It was the discovery of an old Indian lookout fortress, located on the very edge of the Canyon where Bass Camp now is, that led Bass to hunt for the trail into the Canyon. This fortress is about fifteen feet square, outside measurement, and consists of one room, twelve feet square, with a lookout in the eastern wall, which is still to be seen. Remnants of the walls still stand, and at one corner are fully ten feet high. About a mile below this fortress, were discovered two large native water-storage tanks or reservoirs, which, when cleaned out, were capable of holding many hundreds of gallons of water. Further down, on the plateaus beneath, several large pits for the cooking of mescal were discovered.

Cooking of Mescal. This mescal is the succulent and sweet inner leaf of the agave deserti, which is

found in large quantities in this region. The Indians still prepare it in the same manner as did their forefathers. The larger thick leaves are taken from the plants when they are full of sap. Great pits are dug and lined with rocks. Into these pits dry wood, roots, pine cones, etc., are thrown and set on fire, until the whole oven is thoroughly heated. On the hot rocks are then laid the pulpy stalks of the agave; over these is placed a layer of wet grass; then more agave or mescal leaves, more grass, and so on, until the pit is full. Then the oven and its contents are banked over with earth, and allowed to steam and cook for three or four days. The woman in charge is an expert in determining when her "bread is baked." She thrusts stalks of the agave into the heart of the pit before it is finally closed up, and when she deems "time up," she pulls forth one of these stalks. If it is not done to her liking, she allows the process to continue; otherwise the banked up earth is removed, and the contents of the pit withdrawn and placed upon adjacent rocks to dry. It now looks like large cakes of brownish fibres, thoroughly saturated in molasses. In taste it is sweet and fairly palatable, though the fibres render it a food that requires a large amount of mastication. It has great staying qualities, contains much nutrition, and will keep for months, even years. I have eaten pieces of it that were sweet and good over three years after it was made.

Unlimited Fragments of Pottery. In my own wanderings of nearly twenty years in the Grand and Havasu Canyons and their smaller tributary gorges, I have discovered scores of these cliff-dwellings. Ruins uncounted are to be found scattered along the rim, within five to ten miles of the Canyon, and thousands of pieces of pottery of old design have been picked up by the visitors of the past fifteen years.

On the Shinumo, opposite the Bass Trail, are several cliff-dwellings, and as late as the summer of 1908 a young couple camped there for a month on their wedding trip, excavated and discovered a fine stone axe, numbers of pieces of pottery of three different kinds, several pieces with holes bored with the primitive drill of flint or obsidian, a fine spearhead of flint, and a number of arrow points.

Similarity of Cliff Ruins. The whole region of Arizona, New Mexico, Southern Utah, and Southern Colorado abounds in these cliff ruins. The likeness of their appearance, and the fact that everything excavated is of a similar kind, seems to indicate a relationship, both in time of occupancy and in the peoples who built and tenanted them.

The questions now naturally arise: Who were these people? What was their life? Whence did they come? Whither have they gone?

The Race of the Cliff Dwellers. In the earlier days of America's serious researches into her own archaeology, those who led our thought on the subject, though personally they had not seen the cliff-dwellings, declared them to be the homes of the Aztecs, one of the Mexican races found by Cortes below the City of Mexico. Hence today we find people talking about the Aztecs and their ruined homes in Arizona, New Mexico, Colorado and Utah. We used to read of the wonder of the discoverers of these dwellings, at finding them so small. The doorways were small, the rooms themselves less than six feet in width and length, and the ceilings so low that a five-foot man could not stand upright in them. It was reasonable therefore to infer, said these discoverers, that the builders and inhabitants of the cliff-dwellings were an exceedingly small people, dwarfs, as in no other way could the rooms be occupied. And thousands of people who have read about these ruins still hold to the idea that they were inhabited by dwarfs. But who the dwarfs were, or where they have gone to, no one seems to have the remotest idea. But by and by, such men as Bandelier, the Mendeleffs, Stevenson, Cushing, Fewkes, Hough, Hodge and Hewett, began to investigate. They took the field, and carefully explored hundreds of ruins. Then, some of them with a profound knowledge of the Spanish tongue, went through all the records and diaries of the old conquistadores and the padres who accompanied them. They found out all that the early Spaniards had discovered and conjectured. In the meantime, they began to study the languages of the Indians of the regions nearest to the ruins, and question them as to their myths, legends, and traditions bearing upon the ruins, and their researches speedily bore fruit.

Storage Houses. First of all they classified their discoveries. Though scores of skeletons were found, there was not a single dwarf specimen among them. This seemed to be a death blow to the dwarf theory. Stone slabs were used as doors. Necessarily these were comparatively small, since even though large slabs might have been found, they could not have been moved by the cliff-dwellers, on account of their weight. This, in itself, accounted for the size of the doorways. It had long been noticed that these small dwellings were scattered profusely where there were larger dwellings, and finally it became known that the small dwellings were not used for habitations at all. They were merely storage houses for corn and other edibles, farmed by the inhabitants of the larger dwellings. On one occasion, some years ago, I was exploring one of the side gorges of the Havasu. We had seen scores of the cliff dwellings, perched high in the walls of the canyons, until at length one particularly well-built, though exceedingly small structure attracted my attention. My guide was the most intelligent and communicative of the Havasupai Indians, and he immediately responded to my query by crying out:

"Meala-hawa! Meala-hawa!" (Corn house). Further inquiry revealed the fact that all the small dwellings were but storage houses for corn and other foods.

Textiles. Excavation brought forth delicate textiles in cotton and yucca fibre, well-woven, and in a remarkable state of preservation—silent testimony to the dry climate, and the fact that the dwellings were so constructed that rain and snow were practically excluded. Basketry and pottery in large quantities were found, all showing ability in manufacture, also artistic skill, anti-aesthetic conception in the form of the articles and the designs portrayed upon them.

Excavated Relics. Stone hammers and axes, obsidian, flint and other arrow-heads, spear-heads, and knives, mortars and pestles, metates or meal grinders, obsidian and flint drills for making holes through stone or shell, bows and arrows,—the bows of tough wood often brought from afar, and the arrows pointed with chipped flint or obsidian, deftly and securely tied to the shaft with tough and durable strings of sinews; shell beads, pipes, bone awls, punches, needles, etc.; stone fetiches in semblance of animals, the like of which were never seen on land or sea; ornaments of shell, turquoise and onyx, and even a kind of jade; sandals and mats of yucca fibre, and exquisitely delicate feather robes,—these are some of the things that the excavators have found. Corn-cobs, melon rinds and grass seeds may be added to the list.

Old Cemeteries. Then—most interesting of finds—a number of cemeteries were located, and these were raked and scraped over until every visible secret hidden in their depths was brought into the light of the sun.

Tracing the Indian Races. Now here were numbers of facts to work upon. Then the myths, legends and traditions of the Indians living near by were carefully collected and studied, and light began to dawn in the minds of our archaeologists. The Hopis in Northern Arizona, the Zunis in New Mexico, the Acomas who live on the massive cliff twenty miles south of the Santa Fe Railway at Laguna Station, the score of pueblos on the banks of the Rio Grande, even to far-away Taos,—all contributed their share to the elucidation of the mystery. Even the semi-nomadic Navaho had something to say which helped. Cushing found among the Zuni stories galore of their struggles with the fierce and warlike wandering tribes, who constantly harassed the home-loving people who built their rude villages. Fewkes not only unearthed whole cities of the past, but, gained from the nearby Hopis their traditions, which told in reasonable and intelligible form what was most probably their history. He listened while their old men and women recited the stories and legends of their migration from the south northwards, and how certain families or clans came from this or that direction, building and inhabiting certain now ruined dwellings in ages long past. Others heard similar stories, which they investigated as far as possible, compared with the ruins named, and then recorded, with such discovered facts as helped in the elucidation of the problems involved.

Ancestors of the Pueblo People. All these investigations pointed to one great fact, and that was that the cliff and cave dwellers of the Grand Canyon region and all the contiguous country were none other than the ancestors of the present pueblo people,—those who live in the Hopi villages, the Zuni villages, Acoma, Laguna, Santo Domingo, Isleta, Teseque, Jemez, Taos, San Ildefonso, Zia and the rest.

With this luminous fact before them, a greater study began of these pueblo people, and it was then found that, to this day, they use the same utensils, make the same implements, wear the same ornaments, follow the same burial customs, and generally live the same life that these ancient cliff-dwellers did. The conclusions, therefore, are obvious and inevitable. The cliff-dwellers were none other than the ancestors of the pueblo people, a little less advanced, doubtless, in the march of civilization, yet already far progressed from the rude civilization of the nomad. They were driven to occupy the inaccessible cliffs by the constant attacks of the warlike nomads.

Sedentary and Home-loving Indians. Thus the cliff dwellings become interesting memorials of the great fight for existence, where one race has striven to the very death with other races, and the weaker have either given way or been swept out of existence. The picture is easy to draw. The country was peopled with these sedentary and home-loving Indians. They had come largely from the south, had settled down, had built their humble villages, tilled their fields and cultivated their crops. The women made baskets and pottery, and the men hunted game, while the women prepared it for food, and gathered seeds, nuts and roots to eke out their not overextensive dietary. Young men and women grew up, felt the dawnings of love and the final awakenings of the great passion, and then married, settled down in a house the community helped them to build, and began to work a piece of land selected for them, or at least approved, by the town council. For, even in those early days, there is every evidence that these people had a definite and distinct form of democratic government, to the elected officials of which they yielded an almost perfect reverence and obedience. In due time, happy and healthy children were born to them.

Peaceful and Religious. They were a religious people, were these early dwellers in the land. They

built kivas and estufas,—under and above ground ceremonial chambers,—where they regularly and decorously met to worship by dance, recitation of ancient songs, telling of divine leadings and interpositions on their behalf, smoking, singing, prayer, and the observance of other ritual. Thus happy, contented and basking in the favor of Those Above, they dwelt, until suddenly a new and unfavorable element was injected into their hitherto peaceful life. The buffetings of nature they had become accustomed to, and they had kept their bodies healthy so as to resist these assaults, but now human storms were about to burst upon them. Apaches in the south, Comanches and Navahos in the east, Utes and Navahos in the north, Mohaves and Yumas in the west began to encroach upon them. Envious eyes gazed upon their houses and the goods that industry and skill had gathered within. Those who had no food stored when famine swooped upon them, came and begged from those who had. By and by jealousy and envy prompted theft, and then strife began. Strife spread and grew, until war in all its horrors became the normal condition. In self preservation, these peaceable, friendly, hospitable peoples were compelled to be warriors. But their foes were many and crafty, skilful in war, wary in attack and retreat. Their harassments became more than could be borne, so, in their desperation, the peaceable people retreated to the cliffs and walls of the Canyons, where surprise could be guarded against, where a small supply of water could be reasonably sure, and where, not too far away, when permitted to do so, they might cultivate a small piece of arable land.

Compelled to Wage War. Think of the state of affairs! A state of perpetual siege and watchfulness, of readiness to fight at any moment, of keeping lookouts on the alert day and night, of working in the fields with one hand on the implements of peace and industry, and the other on the implements of war. The night attack, murder, rapine, fire and bloodshed became common experiences, and the discovery of many bodies, the skulls crushed with battleaxes, of skeletons of men slain with the deadly arrow, of bodies twisted by torture and charred by fire, reveal what a reign of terror and dread that epoch must have been in the land of the cliff-dweller.

Houses Became Fortresses. For how many decades or centuries this lasted, we do not know. Somewhat uncertain tradition is all we have to rely upon. But ultimately the pressure became less severe. In some cases, hostilities largely ceased; in others, they became less constant. So the pueblos we find in existence to-day slowly began to arise. One by one, the bands of cliff-dwellers dared to leave their wall fortresses and to build in more congenial places, nearer to their fields and springs or water-courses. But, taught by past experience, they made their homes into fortresses. The houses were massed together, largely for protective purposes; there was no means of easy entrance to the bottom story (they were built from two to seven stories high), the only way provided being by a hatchway and ladder from the roof. The rooms of the second story were thrust back a little, so that the roof of the first story formed a kind of courtyard for its inhabitants. Ladders that could easily be removed afforded ingress and egress, and the doorways could be guarded by flat slabs of rock. Numerous loop-holes afforded outlook points, and also opportunity for the shooting of poisoned arrows upon an oncoming foe.

Buildings in Inaccessible Places. In some cases, as that of the Hopi villages, Acoma and old Zuni, the new towns were erected upon almost inaccessible mesas, the steep trails of which could be securely guarded against an army by a handful of hidden men.

Arrival of Spaniards. This was the state of affairs when the Spaniards marched into the country (after the reconnaissance of Fray Marcos), under the leadership of Coronado and his lieutenant, the ensign Tovar. Hence it will be seen that the original discoverers and inhabitants of the Grand Canyon were evidently the ancestors of the present pueblo peoples.

CHAPTER XXIV. El Tovar And Cardenas And The Modern Discovery Of The Grand Canyon

The Spanish Conquistadores. Few romances are more fascinating than the history of the early exploitations of this continent by the Spanish conquistadores. Cortes, Pizarro, Guzman, Narvaez, Coronado are names to conjure with. The wonderful successes of Cortes naturally excited the jealous envy and cupidity of his compeers. In his earlier experiences, Cortes had aroused the anger of Velasquez, Governor of Cuba. Cortes, in one of his many acts of gallantry, had betrayed the sister of Velasquez's mistress. When Velasquez learned the facts, to peremptorily commanded Cortes, who was his subordinate, to marry the unhappy girl. Refusals and imprisonments, threats and anger were the natural consequences, and, while Cortes did ultimately marry her, the enmity thus engendered bore bitter fruit for the husband.

Breach between Cortes and Velasquez. When Cortes made his effective conquests on the mainland and sought to supplant Velasquez, the breach between the two men considerably widened. Both

sought, with embassies, the ear of the King of Spain, Charles V, and while the future conqueror made a deep impression with his reports of conquests to come and treasures already in hand, the Governor's friends were not slow to act. Meanwhile, Cortes had hit upon the bold plan of destroying his ships, and thus compelling his men to march to the subjugation of Mexico. Velasquez was about to dispatch Panfilo de Narvaez with a commission as captain-general to arrest him, and send him in chains to Cuba. The king, however, would not permit this, and Narvaez was sent forth charged to be friendly to Cortes. But this was not to be. Events prevented, and Narvaez finally decided to place Cortes and his whole army under arrest. This was a great undertaking, and required skilful generalship, as well as boldness and skill in execution. Though a gallant warrior, Narvaez was not equal to the task he had set himself, and Cortes, having learned what was before him, turned the tables upon Narvaez and his force by becoming the arrestor instead of the arrested. It requires no great knowledge of human nature to picture the fierce anger of Narvaez and his men. When Cortes eventually released them, it was on condition that he be left alone, and that Narvaez return to Spain. The defeated man, with anger burning his jealous heart to a white heat, did return, and immediately demanded of the king some mission that should allow him to remove the disgrace from his name. To get rid of him, the king sent him to the conquest of what is now Florida.

Expedition to Florida. It was a brave expedition that set forth on a bright day in June, 1527. Five ships and six hundred men made quite a showing, yet the Atlantic Ocean, aided by storms and winds, flouted and routed them, so that it was April of the following year before the main part of the expedition landed at Tampa Bay. Of the total destruction of the party, save Cabeza de Vaca and three or four others, all readers are fairly familiar, as they are likewise of De Vaca's wonderful eight years' journey across the continent.

Arrival at San Miguel. I have thus rapidly traced these events in the early history of the exploration of this continent, for it was the wanderings of Cabeza de Vaca and his final arrival at San Miguel in New Galicia that brought the Ensign Tovar into Arizona, and led to the discovery of the Grand Canyon.

Preliminary Reconnaissance. The Viceroy of New Spain at that time was Antonio de Mendoza, a wise, loyal and farseeing man. He was anxious to checkmate Cortes, and to show that others besides the great, though treacherous conqueror, could make discoveries of new lands, where gold was abundant, and where colonies could be established. Yet he would not be rash. Before sending out a large expedition to conquer the cities and fertile land Cabeza de Vaca had described, it would be wise and cautious to send a cool-headed man, one who was prepared for any hardship, one who had no lust for gold in his own soul, yet who could be relied upon to bring back a straight and true story to the viceroy as to whatever he might discover concerning De Vaca's stories. He should be accompanied by Stephen, the negro, who was one of De Vaca's companions; and thus he would be accurately guided to the places that had been described. The man chosen for this important reconnaissance was a devoted Franciscan, Fray Marcos, to whom I have devoted the next chapter of this book. Marcos went, saw, returned and reported, and upon his report the expedition of Coronado was equipped and fitted out.

Coronado's Army. The fervor with which the Spanish gallants joined Coronado's army of exploration is realized when one remembers that three hundred Spaniards as well as eight hundred Indians were gathered together in a few days. Coronado was a Spanish grandee, traveling at the time of De Vaca's arrival as a royal official visitor. In the words of Castaneda he was "a gentleman from Salamanca, who had married a lady in the City of Mexico, the daughter of Alonso de Estrada, the treasurer and at one time governor of Mexico, and the son (most people said) of his Catholic Majesty Don Ferdinand, and many state it as certain." And the same historian later on continues, in his simple and naive way, to tell us about Tovar and many others: "When the Viceroy, Don Antonio de Mendoza, saw what a noble company had come together, and the spirit and good will with which they had all presented themselves, knowing the worth of these men, he would have liked very well to make every one of them captain of an army; but as the whole number was small he could not do as he would have liked, and so he appointed the captains and officers because it seemed to him that if they were appointed by him, as he was so well obeyed and beloved, nobody, would find fault with his arrangements. After everybody had heard who the general was (Coronado), he made Don Pedro de Tovar ensign general, a young gentleman who was the son of Don Fernando de Tovar, the guardian and high steward of the Queen Dona Juana, our demented mistress—may she be in glory."

A Brilliant and Gallant Company. After the naming of their officers, Castaneda regrets that he has "forgotten the names of many good fellows. It would be well if I could name some of them, so that it might be clearly seen what cause I had for saying that they had on this expedition the most brilliant company ever collected in the Indies to go in search of new lands. But they were unfortunate in having a captain who left in New Spain estates and a pretty wife, a noble and excellent lady, which were not the least causes for what was to happen."

First Disappointment. Poor Coronado! The reader is thus prepared to throw upon him the blame

because similar treasures to those found by Cortes in the land of Montezuma were not found in Arizona and New Mexico. In spite of his having so many fine gentlemen in his official family, Coronado's disappointments and disillusionments began early. As he reached the region where the wilderness began—just past the Pima country—he felt downhearted, "for, although the reports were very fine about what was ahead, there was nobody who had seen it except the Indians who went with the negro, and these had already been caught in some lies."

Meeting with Indians. When the expedition first came in contact with the Indians of the desert region, the gallant members of the party must have been a little scared, for, according to Castaneda: "Some Indians... during the night... in a safe place yelled so that, although the men were ready for anything, some were so excited that they put their saddles on hind-side before; but these were the new fellows. When the veterans had mounted and ridden round the camp, the Indians had fled."

Coronado Reaches Zuni. Coronado finally reached Cibola—the mythical—now known to be Zuni, in New Mexico. Here he was not only disappointed because he did not find the great treasure so long anticipated, but he was wounded. Getting into converse with him, the Indians told him of the people who lived round about, and among others, of those who dwelt in the province of Tusayan. And here is what Castaneda tells us about the discovery by Europeans of those whom we now know as the Hopi.

Castaneda's Account of their Experiences in the Canyon. "The General had sent Don Pedro de Tovar to these villages with seventeen horsemen, and three or four foot soldiers..Juan de Padilla, a Franciscan friar, who had been a fighting man in his youth, went with them. When they reached the region, they entered the country so quietly that nobody observed them, because there were no settlements or farms between one village and another and the people do not leave the villages except to go to their farms, especially at this time, when they had heard that Cibola had been captured by very fierce people, who traveled on animals who ate people. This information was generally believed by those who had never seen horses, although it was so strange as to cause much wonder. Our men arrived after nightfall and were able to conceal themselves under the edge of the village, where they heard the natives talking in their houses. But in the morning they were discovered, and drew up in regular order, while the natives went out to meet them, with bows and shields, and wooden clubs, drawn up in lines without any confusion. The interpreter was given a chance to speak to them and to give them one warning, for they were very intelligent people, but nevertheless they drew lines and insisted that our men should not go across these lines toward their village. While they were talking some men acted as if they would cross the lines, and one of the natives lost control of himself and struck a horse a blow on the check of the bridle with his club. Friar Juan, fretted by the time that was being wasted in talking with them, said to the captain, 'To tell the truth, I do not know why we came here.' When the men heard this, they gave the Santiago (The Battle Cry of Spain), so suddenly that they ran down many Indians and the others fled to the town in confusion. Some indeed did not have a chance to do this, so quickly did the people in the villages come out with presents, asking for peace. The captain ordered his force to collect, and, as the natives did not do any more harm, he and those who were with him found a place to establish new headquarters near the village. They had dismounted here when the natives came peacefully, saying that they had come to give in the submission of the whole province and that they wanted him to be friends with them and to accept the presents which they gave him. This was some cotton cloth, although not much, because they do not make it in that district. They also gave him some dressed skins and some corn meal, and pine nuts, and corn and birds of the country. Afterward they presented some turquoises, but not many. The people of the whole district came together that day and submitted themselves, and they allowed him to enter their villages freely to visit, buy, sell, and barter with them.

"It is governed like Cibola, by an assembly of the oldest men. They have their governors and generals. This was where they obtained the information about a large river, and that several days down the river there were some people with very large bodies.

"As Don Pedro de Tovar was not commissioned to go farther, he returned from there, and gave this information to the general, who dispatched Don Garcia Lopez de Cardenas with about twelve companions to go to see this river. He was well received when he reached Tusayan and was well entertained by the natives, who gave him guides for his journey. They started from here loaded with provisions, for they had to go through a desert country before reaching the inhabited region, which the Indians said was more than twenty days journey. After they had gone twenty days, they came to the banks of the river, which seemed to be more than three or four leagues above the stream which flowed between them. This country was elevated and full of low, twisted pines, very cold, and lying open toward the north, so that, this being the warm season, no one could live there on account of the cold. They spent three days on this bank looking for a passage down to the river, which looked from above as if the water was six feet across, although the Indians said that it was half a league wide. It was impossible to descend, for after these three days Captain Melgosa and one Juan Galeras and another companion, who were the three lightest and most agile men, made an attempt to go down at the least difficult place, and went down until those who were above were unable to keep sight of them. They

returned about four o'clock in the afternoon, not having succeeded in reaching the bottom on account of the great difficulties which they found, because what seemed to be easy from above was not so, but instead very hard and difficult. They said that they had been down about a third of the way and that the river seemed very large from the place that they reached, and that from what they saw the Indians had given the width correctly. Those who stayed above had estimated that some huge rocks on the side of the cliffs seemed to be about as tall as a man, but those who went down swore that when they reached these rocks they were bigger than the great tower of Seville. They did not go farther up the river because they could not get water. Before this they had to go a league or two inland every day late in the evening in order to find water, and the guides said that if they should go four days farther, it would not be possible to go on, because there was no water within three or four days, for when they travel across this region themselves they take with them women loaded with water in gourds, and bury the gourds of water along the way to use when they return, and besides this, they travel in one day what it takes us two days to accomplish.

"This was the Tison (Firebrand) river, much nearer its source than where Melchior Diaz and his company crossed it. These were the same kind of Indians, judging from what was afterward learned. They came back from this point and the expedition did not have any other result. On the way they saw some water falling on a rock and learned from the guides that some bunches of crystals which were hanging there were salt. They went and gathered a quantity of this and brought it back to Cibola, dividing it among those who were there. They gave the general a written account of what they had seen, because one Pedro de Sotomayor had gone with Don Garcia Lopez as chronicler for the army. The villages of that province remained peaceful, since they were never visited again, nor was any attempt made to find other peoples in that direction."

Place Described by Cardenas Unknown. There has been some attempt on the part of students who are familiar with the country to locate the spot where Cardenas and his men gazed down into the depths of the Canyon of the Colorado River. The long distance travelled, according to Castaneda's narrative, was totally unnecessary to bring the Spaniards to the banks of the river. Twenty days' journey, through a desert region, away from Tusayan in the direction of the Colorado River, would have brought them as far down as Yuma or Mohave. But at these points there is no canyon. It is well known that the Canyon system terminates near the Great Bend, some miles beyond the Grand Wash, hence this could not have been the objective point of the guides of Cardenas.

Dellenbaugh's Opinion. Dellenbaugh, in his "Romance of the Colorado River," argues that the Tusayan of Castaneda could not have been the land of the Hopis, for, as he truthfully remarks, "an able-bodied man can easily walk to the brink of the Marble Canyon from there in three or four days." He also says that it has usually been stated, without definite reason, that Cardenas reached the Grand Canyon about opposite Bright Angel River, or near the spot where El Tovar Hotel now stands. I have never heard this statement made by any one who has any knowledge either of Castaneda's narrative, or of the relative locations of the Hopi towns and the Grand Canyon.

Evidently a Hopi Stratagem. The Hopis of to-day, with whom I have talked, insist upon it that Cardenas was taken to the barren and desolate point near the junction of Marble Canyon, the Little Colorado Canyon and the Grand Canyon. Here, the river may be said to come from the northeast and turn toward the south-southwest, and the conditions are not at all like those described by the historian. But if one accepts this modern statement of the Hopis, he is met with the questions: Why make Cardenas travel fifty leagues to see an inaccessible river that could be reached in three or four days? Did Cardenas really travel fifty leagues? I do not know, but I hazard the conjecture that the Hopis gave Cardenas as much wandering about as they could, took him to this terribly bleak and barren spot where even to-day one can scarcely prevail upon a Hopi or Navaho to guide him, in order that he might be discouraged from making further explorations in the neighborhood. The Hopis had no use for explorers or strangers. They had suffered too much from foes, for too many decades, to welcome any one who seemed eager to possess anything of theirs, and, in my judgment, their treatment of Cardenas was a deliberate ruse to get rid of him. They had a trail over which they habitually traveled, that brought them to Huetha-wa-li, the White Rock Mountain,—opposite Bass Camp,—and on to the Havasupai villages. Several times a year they went to and fro over this trail. It crosses the Little Colorado where it would have been easy to show the Spaniards the Salt Spring, to which Castaneda later refers. There is another point on the river, some miles beyond Bass Camp, where the Hopis used to visit the Havasupais, and that is just beyond the Great Curve, where the river may be said to flow from the northeast to the southsouthwest. But both at Bass Camp and at this point, the Havasupais had made trails down to the river, of the existence of which the Hopis may, or may not, have known. So I freely confess that, as yet, I have not settled in my own mind at what point Cardenas and the Spaniards gazed into the depths of the Great Canyon.

Alarcon's Discovery of Colorado River. While the main portion of Coronado's army had been advancing eastward, a sea force sent out to cooperate with Coronado, under Alarcon, had sailed up the

Gulf of California, and had entered the Colorado River, thus solving the problem of its exit into the Gulf. To Alarcon, belongs the discovery of the Colorado River, which he named the Buena Guia. He went up the river twice in boats, the second time ascending possibly as high as a hundred miles above the mouth of the Gila. Finally he entered "between certain very high mountains, through which this river passeth with a straight channel, and the boats went up against the stream very hardly for want of men to draw the same." He claims to have passed above this place undoubtedly one of the lesser canyons of the Colorado found below the Needles, where the Santa Fe Railway crosses the river—and here magicians tried to destroy him and his party by setting magic reeds in the water on both sides. Of course this failed, but Alarcon decided to go no further. Here he erected a very high cross, on which was carved a statement to the effect that he had reached this spot, so that if Coronado's men should find it, they would know he had ascended the river thus far.

Town of San Hieronimo is Established. In the mean time, a small force of seventy or eighty of the weakest and least reliable of the men of Coronado's army was left in September, 1540, at a town which Cabeza de Vaca had named Corazones, or hearts, because the people there fed him on the hearts of animals. Coronado's plan was to establish a town here, which he or his lieutenant in charge of this portion of the army called San Hieronimo de los Corazones. These men and the care of the new settlement were left to Melchior Diaz, with orders to protect the road between Cibola and New Spain, and also to attempt to find some means of communicating with the vessels under Alarcon. Diaz, with twenty-five selected men, started for the seacoast, went to the Gulf, across to the coast, back again up the river, where he found Alarcon's cross, and eventually returned to San Hieronimo, there to meet with death by an accident. Owing to the habit of the Indians at the lower portion of the river of warming themselves in cold weather with a burning stick, Diaz called the river El Rio del Tizon —the River of the Firebrand.

Disaster Comes to the Spaniards. Disappointed at what he had found at Cibola and Tiguex, Coronado now decided to go with his whole army to a place which had been described to him in most glowing terms by an Indian. He told of a place of fabulous wealth named Quivera, and, says the ancient historian: "He gave such a clear account of what he told, as if it was true and he had seen it, that it seemed plain afterward that the devil was speaking in him." Carried away by these glowing visions of wealth, Coronado sent Tovar back to San Hieronimo. Melchior Diaz was dead, and the little settlement was in an excitement, because one of the soldiers had just been killed by a poisoned arrow, shot by one of the natives. In trying to punish this offence, owing to the folly of the officer sent by Tovar in charge of the primitive force, seventeen more soldiers were killed by poisoned arrows, so that the ensign hastily abandoned the place, and moved with his sadly reduced force forty leagues toward Cibola, into a valley called Suya. From this point, he ultimately collected the best of his men, and marched on to Tiguex, to find Coronado already gone on his heartbreaking expedition to Quivera.

Coronado Returns to New Spain. After long and fruitless search, Coronado returned to New Spain, a disappointed man, disgraced and discarded. Tovar returned with him, but doubtless later found congenial work in other fields.

CHAPTER XXV. Fray Marcos And Garces, And Their Connection With The Grand Canyon

Hotel and Stations Named for Spanish Priests. At Williams, the gateway to the Canyon, the Santa Fe Railway Company recently has erected a typical Mission style hotel, to which the name of Fray Marcos has been given. Here Canyon visitors who stop off between trains find excellent accommodations. At Needles, California, on the Colorado River, is another reinforced concrete building, named after another Franciscan priest, Francisco Garces. Both Fray Marcos and El Garces are managed by Fred Harvey, who also has charge of El Tovar Hotel. The history of this part of the Southwest for the last thirty years cannot be written without mention of this masterful man, who made railway meal service a fine art. In accordance with a policy established some time ago by the Santa Fe Company, the architecture of their station hotels conforms to the Spanish Mission styles, as far as possible, and they are given names of those who are inseparably connected with the romantic history of this region.

Fray Marcos Comes to America. In the chapter "Tovar and the Discovery of the Grand Canyon," brief reference is made to the reconnaissance undertaken by Fray Marcos de Niza, a Franciscan friar, to determine the truth of the reports brought into Culiacan by Cabeza de Vaca. This narrative of Fray Marcos is taken, in the main, from George Parker Winship's introduction to his translation of Castaneda's narrative, published in the fourteenth annual report of the United States Bureau of Ethnology. This friar was born in Nice, then a part of Savoy, and he came to America about the year 1531. His contemporaries called him a Frenchman, though there is no evidence that he was of French parentage. He was sent as one of the religious to accompany Pizarro on his expedition to Peru, and was

present at the trial and execution of the native king, Atahualpa. From Peru, he returned to Central America, and thence he returned on foot to Mexico. He was a man of known bravery and character, and already was appointed to the office of vice-commissary of his order. Thus Mendoza felt no hesitation at charging him with the arduous mission of penetrating to the heart of what are now Arizona and New Mexico, as far as the reported seven cities of Cibola, and bringing back to his superiors a truthful account of what he saw. The father provincial of the order, Fray Antonio de Ciudad Rodrigo, on August 26, 1539, certified to the high esteem in which Fray Marcos was held, and stated that he was skilled in cosmography, and in the arts of the sea, as well as in theology.

Mendoza Instructs Fray Marcos. Mendoza drew up for him a set of instructions as to how he should proceed. These were very explicit as to the good treatment the Indians were to receive at his hands, and required him to make certain scientific observations with due care and thoroughness. He was to leave letters at stated intervals, and also send back to the viceroy reports of his progress, wherever possible. Coronado escorted him as far as the new town of Culiacan, and on March 7, 1539, accompanied by a lay brother, Onorato, he started on his trip.

Courage of Spaniards. When it is remembered that this journey of several hundreds of miles was on foot,—for the rule of the Franciscans was that all their members should travel afoot save in cases of extreme necessity,— through a barren, almost waterless desert, roamed over, by warlike Indians, the courage of the man is apparent. Yet he was not remarkable in this. The history of Mexico and of all the Spanish colonies, as well as those of New Mexico (which used to include Arizona), Texas, and California, abounds in the names of men of equal courage and daring. On reaching Petatlan, Brother Onorato fell sick, and Marcos had to leave him behind; thence alone, as far as white men were concerned, he traveled to Cibola. Six Indian interpreters and a large number of natives accompanied and followed him, and Stephen, the negro, went ahead as his guide.

Investigates Regarding Pearl Islands. He reached Vacapa (now known as Matapa), in Central Sonora, two days before Passion Sunday, which in 1539 fell on March 23. From this point he sent to the seacoast for some Indians, in order that he might learn from them something about the pearl islands, of which rumors had come to Cabeza de Vara. He remained here until April 6.

Stephen, the Guide, Is Sent Ahead. In the meantime, Stephen had pushed on to the north, leaving on Passion Sunday, with orders from Fray Marcos not to go further than fifty or sixty leagues ahead. If he found any signs of a rich and populous country before he had gone that distance, he was not to proceed further, but was to return for Marcos, or remain, and send messengers for him, bearing a white cross the size of the palm of his hand. If the news was very promising, the cross was to be twice the size, and if the country about which he heard promised to be larger and better than New Spain (as Mexico was then generally known), a cross still larger than this was to be sent back. Castaneda says that Stephen was sent on ahead because he and Marcos did not agree well, the negro not only showing covetousness and the determination to acquire the turquoises of the natives, but also an amorousness that demanded of them their youngest and prettiest women.

Messengers Bring Good News to Marcos. Four days after his departure, messengers sent by Stephen reached Fray Marcos with a very large cross as tall as a man. This, according to the signs established between them, meant wonderful news. One of the messengers told what it was. He it was, indeed, who had given the news to the negro, and he, in turn, had sent the native on to Fray Marcos. This is what Marcos records of the Indian's story:

Report of Turquoise Stones. "There are seven very large cities in the first province, all under one lord, with large houses of stone and lime; the smallest one story high, with a flat roof above, and others two and three stories high, and the house of the lord four stories high. They are all united under his rule. And on portals of the principal houses there are many designs of turquoise stones, of which he says they have a great abundance and, the people in these cities are very well clothed. Concerning other provinces farther on, he said that each one of them amounted to much more than these seven cities."

Marcos got a very clear idea of what actually existed, though he misunderstood the democratic community rule of the people of Cibola, under a chief whom they had elected to the office, for the rule of an overlord. The houses were built about as he describes, and whitewashed inside and out with gypsum, and though the placing of turquoises in the door jambs is discontinued, the traditions of the people clearly indicate that at one time that was their general practice.

Messenger from the Coast Returns. Had he been a man of great impatience, Marcos would have started off at once to discover the truth or falsity of these reports, but he waited until his messenger who had been sent to the coast returned, with natives of that region. These told him of pearls found in quantity near their homes. Other Indians, with painted or tattooed faces, chests and arms, living to the east (doubtless the Pimas or Sobaipuris), also visited him, and told him of the seven villages with which

they claimed to be familiar.

Marcos Follows Stephen. The friar was now ready to start, and on the second day following Easter (April 6), he left, expecting to find Stephen waiting for him at the village from which his messenger had been sent. Instead, he met a second cross, much larger than the first one, with messengers who gave a fuller and completer account of the seven villages, but agreeing in every particular with what had been told before. All this was confirmed when Friar Marcos reached the first village, so he hastened on, doubtless annoyed somewhat that Stephen had disobeyed his orders, and journeyed beyond the prescribed distance. But it was perhaps well for him that Stephen had done so. Gathering turquoises and women as he proceeded, and followed by an increasing number of natives, the negro pushed on to Cibola. Before arriving at the principal town, he sent forward a notice of his approach in the shape of a gourd, to which were attached a few strings of rattles and two plumes, one white and the other red. This was unfortunate for Stephen, for undoubtedly it was part of the paraphernalia of a medicine man of a tribe hostile to the Cibolans. Its receipt made the people both angry and suspicious. The chief who received the gourd threw it upon the ground, and told the messengers that "when their people reached the village, they would find out what sort of men lived there, and that instead of entering the place, they would all be killed." Stephen paid no attention to this warning, but recklessly entered the village. He was duly received by the chief, but instead of his being acclaimed, and a generous welcome accorded him, he was coldly requested to remain without the walls, and occupy a house that was pointed out to him. This for years has been the habit of the Zuni people of our time, in dealing with strange Mexicans who come to visit them, owing to their religious ceremonies.

Stephen Is Killed. Poor Stephen's confidence doubtless began to leave him the following day, when his turquoises and women were taken from him, and he found himself a prisoner without food or drink. As much afraid now as he had been over-confident before, he endeavored, during the early morning hours, to escape, but was overtaken and killed, together with some of his followers. The others, to the number of sixty, returned to Fray Marcos with the appalling news.

Indian Followers Wish to Desert. But, undaunted and unafraid, the brave friar kept on his way. He was sent to see the villages of Cibola, and make a report on them. He had injured no one, and intended to injure no one. While he must be circumspect and not risk his life unnecessarily, he must perform his duty, even though by so doing he put his life in jeopardy. Another difficulty confronted him. The first reports of Stephen's death were accompanied with the statement that all of his native followers were also slain. As soon as the Indians who were with Fray Marcos heard this, they wished to desert and return home at once; but he opened up some bundles of presents he had with him, and by a free distribution of them prevailed upon his escort to remain. Then he went apart to pray, and while he was gone the ingrate Indians decided to kill him as the source of all their troubles. It took a good deal of argument, more presents, and some threats, to persuade them that to kill him would be the height of folly. Before they had time to hatch up any more plots, he succeeded in getting two of the chief men to go with him to a hilly place overlooking the city of Cibola, which he describes as a city on a plain, on the slope of a round height. In his report he writes:

Marcos' Description of Cibola. "It has a very fine appearance for a village, the best that I have seen in these parts. The houses, as the Indians had told me, are all of stone, built in stories, and with flat roofs. Judging by what I could see from the height where I placed myself to observe it, the settlement is larger than the City of Mexico.... It appears to me that this land is the best and largest of all those that have been discovered."

Marcos Returns with His Report. With "far more fright than food," says the candid friar, he hastened back to New Spain, and made his report to Coronado in person at Compostela. Later he wrote it officially to the viceroy, also to the head of his order, and on September 2, in the presence of both Mendoza and Coronado, swore to the truth of what he had written.

High Office Is Given Him. I have already (in another chapter) told of the effect of Fray Marcos's report. It made a most popular man of him, and soon thereafter, when the position of father provincial of his order was vacant, he was chosen to fill the office,—the highest in the district. Henceforth he was called to fill all the pulpits of the region. He became known as a great preacher, and doubtless interlarded his sermons with many references to his wonderful adventures in search of the famous "seven cities." The result was the whole country became excited, and many went on the expedition, the failure of which we are familiar with.

Cortez Discredits Marcos. In the meantime, Cortez was not quiet. It must not be forgotten that he claimed all this northern country by right of discovery, and he protested most vigorously against the sending forth of Coronado's expedition. Just as Coronado was about to start, Cortez returned to Spain, and there presented a memorial to the king (June 25, 1540), setting forth in detail the ill-treatment which he had received from Mendoza. In this, according to Winship, "he declared that after the viceroy

had ordered him to withdraw his men from their station on the coast of the mainland toward the north, where they were engaged in making ready for extended inland explorations, he had a talk with Fray Marcos. 'And I gave him,' says Cortez, 'an account of this said country, and of its discovery, because I had determined to send him in my ships to follow up the said northern coast and conquer that country, because he seemed to understand something about matters of navigation. The said friar communicated this to the said viceroy, and he says that, with his permission, he went by land in search of the same coast and country as that which I had discovered, and which it was and is my right to conquer. And since his return, the said friar has published the statement that he came within sight of the said country, which I deny that he has either seen or discovered; but instead, in all that the said friar reports that he has seen, he only repeats the account I had given him regarding the information which I obtained from the Indians of the said country of Santa Cruz, because anything which the said friar says that he discovers is just the same as what these said Indians had told me; and in enlarging upon this and in pretending to report what he neither saw nor learned, the said Friar Marcos does nothing new, because he has done this many other times, and this was his regular habit, as is notorious in the provinces of Peru and Guatemala; and sufficient evidence regarding this will be given to the court whenever it is necessary.'"

Marcos an Exaggerator. Cortez never made any attempt to confirm his statements, and it is well known that he himself was very reckless in his handling of the truth where his own purposes were to be served, or the plans of his enemies defeated. It seems a pretty clear matter that, while the friar told the truth as nearly as possible as to what he actually saw, he did not hesitate to let the more exaggerated statements of the things he had merely heard have as full weight as the people to whom he told them desired. Anyhow, he has suffered a great deal of abuse as an exaggerator, and even worse, though it must never be forgotten that people who fail are always ready to blame every one concerned except themselves. Bandelier warmly defends Fray Marcos, and his knowledge is confessedly great; but Winship thinks he treats the charge too lightly.

Poor Fray Marcos, afflicted with rheumatism, had a painful time during the remainder of his life, and finally died March 25, 1558, in the house of his order, in the City of Mexico. Religious Zeal of Garces. It is appropriate also that Fray Francisco Garces should find an honored place in these necessarily brief historical notices. Fired with a wonderful zeal for souls, without the urging or backing of any superior save the Spirit of God, which spoke to his own soul, he marched from San Xavier del Bac, his station in Northern Mexico (now Arizona), across these inhospitable wilds, merely seeking opportunities for the establishment of mission settlements, where the natives could learn of the way of Christ, salvation from sin, and heaven. Five times he left his mission and made entradas (as they are called) into the interior country, anxious to expand his work and his influence. On the third of these, he followed the course of the Gila down to the Colorado River, and descended along its banks, possibly as far as its mouth. His fourth journey was with the intrepid Captain Juan Bautista de Anza, when he set forth in 1774. to discover a road from the missions already established in Northern Mexico, over the then unknown Arizona and Colorado deserts, to the new missions of California. The road was discovered and, in spite of its hardships, deemed feasible, for in 1775-1776 De Anza went over it again, accompanied by the band he had gathered together for the establishment of a Spanish colony at San Francisco. His chaplain on this occasion was Padre Pedro Font. Fray Garces, a fellow Franciscan, also went along as far as the Colorado River. Here he left the party, journeyed down the Colorado to the Gulf, returned to the Mohaves, then crossed the Colorado Desert to San Gabriel Mission in California, back again to the Mohaves, and finally across the Arizona desert to the province of Tusayan, the land of the Hopis.

Havasupais Guide Garces to the Hopi Towns. It was on June 4, 1776—memorable year in American annals—that Garces started under the guidance of some Wallapais for the Hopi towns. They had given him fair details of the country he would have to travel over. Passing by their own home in Diamond Creek (one of the earliest approaches to the Grand Canyon), he decided to visit the Havasupais, whom he calls Yabesuas. Those familiar with Spanish spelling and pronunciation will readily recognize that they are almost one and the same. The Wallapais took the priest down their own trail into Havasu or Cataract Canyon,—a trail which made his head swim, and where his mule had to be left behind, to be brought to him later by another route. He also describes the ladder down which he climbed just before reaching the place where the innumerable springs flow out of the solid rock and form Havasu Creek. It was the same ladder descended eighty years later by Egloffstein, Lieutenant Ives's artist, who was so heavy that he took down ladder and all with him. Here Garces stayed five days, being hospitably treated by the natives, who brought him melons, squash, corn, beans, etc., and who had thriving trees of peaches and apricots.

The Grand Canyon Is Reached. Leaving the kindhearted Havasupais, he returned to the plateau above, and soon saw for the first time the deep gorge of the Colorado River itself,—the Grand Canyon. He describes with surprising accuracy of detail the break in the Kaibabs, where the Marble and Little Colorado Canyons unite and form the Grand Canyon, and then, a little later, he gives a true description

of the Little Colorado Canyon. From his account, he doubtless went down by the old Hopi Salt Trail into the gorge of the Little Colorado, and thus on to Oraibi, which he reached July 2, 1776.

Wishes to Baptize the Indians. About this time those interesting, exciting and most important of all discussions were raging in the Continental Congress on the eastern side of the continent, which, two days later, were to result in the signing of the Declaration of Independence. Jefferson had undoubtedly written it at this time, but Garces knew not the name of the great patriot and his compeers. He was bent on a different mission. He wished to declare to the Hopis how they might have freedom,—freedom from sin and the fear of hell. For, as Elliott Coues (the scholarly translator of Garces's diary, published a few years ago by F. P. Harper of New York) expresses it: "It made him sick at heart to see so many natives going to hell for lack of the three drops of water he would sprinkle over them if only they would let him do it."

Garces Reaches Oraibi. His arrival at Oraibi caused great excitement, though a priest had been at work there as early as 1650. There were four priests laboring among the Hopis in 1680, when the great native uprising throughout New Mexico and Arizona occurred, and all of them, with many others (laymen and soldiers as well) were slain at that time. Then, too, the remembrance had not died away of the total destruction of the town of Awatobi (one of the Hopi towns of that day) in the year 1700, because the people of that place were hospitable and tolerant of the "long gowns." The medicine men and leaders of all the adjacent towns gathered together, and led a force which fell upon Awatobi in the dead of the night. Every male in it was slain, and only some of the women and girls were saved and taken to the other towns. The place was fired, and remained a neglected ruin, until the scholarship and labors of recent ethnologists dug up both the town and its tragic history.

Indians Are Hostile. Poor Garces! The hostility of the Oraibis was apparent. They refused to allow him to enter a house, and he was compelled to camp outside, in a corner formed by a jutting wall, while his guide sheltered his mule in a sheep corral. He built his little camp fire, cooked his frugal meal, and slept there during the night, doubtless committing himself and the people who refused to receive him to the protecting mercies of God. The next day the chiefs of the town came to him, clothed in their ceremonial costumes and feathery head-dresses, and bade him leave the place. He held up his crucifix as an index of his mission, and endeavored to tell them that he came solely to do them good. But they would have none of him, and on the following day, the memorable Fourth of July, they expelled him peaceably but forcibly from their town. He returned to the Colorado River again on July 25, and soon to San Xavier, his mission, a failure.

Establishes Missions among the Yumas. Now he threw his whole heart into the two missions which the authorities had decided to place among the Yumas. Captain Palma, a Yuma chief, who had been very friendly, had urged it repeatedly, and now the desires of both were to be fulfilled. In 1779, Garces went to prepare the way, and the following year the establishment took place. The missions were eight miles apart; one was named La Purisima Concepcion; the other, San Pedro y San Pablo de Bicuner. Garces and Barraneche took charge of the upper mission, and Diaz and Moreno of the lower.

Garces Is Killed. The missions were a failure from the start. The few Spanish soldiers sent to guard the padres were obliged to utilize some of the best lands which were tilled for their own benefit. The appropriations from the treasury were too small to permit of anything but the rudest and simplest of structures, and Palma and his friends soon became disgusted with the whole affair. On July 17 the Indians, many of whom had been hostile from the first, arose and massacred both colonies of white men, as well as a small force of soldiers under former Governor Rivera, of California, who was encamped temporarily on the western side of the river. At first, Garces' life was spared, but before the day was over he and his co-laborer were beaten to death, and his unselfish mission on earth ended. In my book "In and Out of the Old Missions of California", I give this interesting and tragic history in fuller detail. This, then, is the man whose name is given to the railway building at Needles, in order that his heroic labors for the Indians of the Colorado River region may not be forgotten.

CHAPTER XXVI. Powell's And Other Explorations Of The Grand Canyon

In the chapters on Tovar and Cardenas, Fray Marcos and Garces, I have given some idea of the history of the Spanish explorations of the Grand Canyon region. In this chapter is presented an account of the brave work done by later explorers, until now the Grand Canyon and the whole canyon system of the Colorado River is as well known as the course of many a less dangerous stream.

Early American Trappers. Who can know whether any of those daring souls, the trappers of the earliest days of American history, ever penetrated to the depths of these canyons in their expeditions after the pelts of fur-bearing animals? These men were the true pioneers. They ever kept thrusting the frontier line further forward. As civilization, with people, villages, towns, cultivated lands, advanced

westward, still further west pushed the trapper. Civilization was a hindrance to his business. The wild animals he sought fled from the presence of many men. Though the Indian had penetrated more or less to all these secluded regions, the Indian has enough of the reserve of outdoor life not to disturb any of the animals. It is the imperious, self-willed, noisy white man who drives away the shy creatures of the wild.

United States Purchases New Territory. In 1815, the small nation known as the United States had become eager to grow, and Jefferson had made his memorable purchase of all the territory north of the Red River, the Arkansas and the forty-second parallel, as far as the British boundary or Canadian line, then still unsettled, and the disputed region of Oregon. Lewis and Clark had made their wonderful expedition, and the world, through the publication of their report, knew a little of the immense territory now acquired. In the previous century, the Spaniards had discovered the value of the pelts of the fur-bearing animals of California, and a few venturesome spirits were soon to learn that the western mountains, forests and rivers abounded in the same profitable game. In his interesting and illuminative American Fur Trade of the Far West, Chittenden has shed a flood of light on these early-day operations.

Trappers Seek Riches. Padilla, Kino, Garces, Escalante, and others of the brave Spanish padres, had penetrated into some portion of these unknown territories, but they had gone with the vow of poverty upon them. No greed for gold blinded their eyes to the rights of others. A hunger for the salvation of souls was their only hunger; the glitter of the golden harps and crowns in heaven the only glitter that attracted them. But the trappers had a different purpose. They were a different kind of men. Rough and ready, venturesome to the last degree, turbulent as the raging Colorado, imperious in their high-handed dealing with all who stood in their way, they were about to enter the conflict for the sake of gold, and gold is the most remorseless driver, the most soul-destroying master man ever has had.

Trappers the Primary Cause of Indian Wars. It has been the trappers who largely have given to us our notions of the American Indians of the West. For they were the first men to come into conflict with them. They were the first to dispute with them about water-holes and springs, about "rights," about "property." Is it necessary to ask what kind of a report such men would bring of any who stood in their way? Is it necessary to know much of human nature to know how these men treated the Indians? The trappers not only began the lucrative fur trade of the West, that laid the foundation for several vast American fortunes, but they also laid the foundation for a series of Indian wars that have cost the United States more lives and treasure than all the furs ever gathered on earth were worth. And not only did they take the furs from the animals they trapped. The agents of the Fur Companies (whether British or American) took them from the Indians. Read Jim Beckwourth's accounts of how he traded with the Indians, and listen to his own comments upon his actions. As Dellenbaugh vividly says: "Roughshod the trapper broke the wilderness, fathomed its secret places, traversed its trails and passes, marking them with his own blood and more vividly with that of the natives."

The Ashley Fur Camp Is Established. Early in the last century, the trappers were operating on the head waters of the Colorado River. Green River Valley was discovered, and in 1822 one of the most brilliant men of the West of that period, General William Henry Ashley (born in Virginia in 1778, went to Missouri in 1802, and in 1820 was its first governor), went into the fur trade with Andrew Henry, an expert trapper. Two years later, with a band of such men as Henry, Ashley established a camp in Green River Valley, and, with his men, set out on expeditions for furs and pelts.

Inscription at Red Canyon. When in June, 1869, Powell and his party were passing through the fourth canyon after leaving Green River, now known as Red Canyon, they saw an inscription on one of the huge rocks above the river, done in black letters, sheltered by a slight projection of the rock which acted as a cornice, reading:

"Ashley 18…5"

The third figure was obscure and some of the party read in 1835, some 1855.

Ashley Expedition Unsuccessful. It should have been read 1825. Powell was not familiar with the history of the fur traders. Ashley was an unknown name to him, but as Chittenden has so vividly pointed out, he, in his way, left his impress upon our Western civilization as strongly as did Powell. Would that it had been as nobly, as grandly beneficent. Ashley fitted up a trapping expedition to go down Green River, in spite of its known dangers, and, expecting to find beaver in plenty, took but little provisions along with them. At first they did fairly well. Then, as the canyons narrowed, to their horror and distress, as well as surprise,—for they had kept none of the meat of the beavers they had killed,—the animals ceased to appear, and starvation stared them in the face. For six days they were without food. The precipitous walls of the Canyon forbade escape, and at length they became so demoralized that Beckwourth declares they actually proposed to cast lots as to which should be killed to make food for the others. This fearful proposition so horrified Ashley that he begged them to hold out a while longer, and to their joy they soon emerged from the Canyon, possibly at a place known as Brown's

Hole; where Provo, an experienced trapper, had his camp. From here they abandoned the Canyon expedition, and doubtless returned with Provo to Salt Lake. Powell named the falls near where Ashley left his name Ashley Falls.

There is every reason to assume that other trappers attempted the passage of the Canyon, for Powell found a bake oven, several tin plates, and part of a boot in Lodore Canyon, which he imagined were Ashley's; but, as we have seen, Ashley never went down so far.

Other Unsuccessful Trappers. In his excellent Romance of the Colorado River, Dellenbaugh recites at length, from their own narratives largely, the adventures of several trappers and others, whose experiences are connected with the Colorado River,—the Patties, Jedediah Smith,

Kit Carson, William Wolfskill, Farnham, Fremont, Lieutenant Derby, Captain Johnson, and others, who, however, never came actually into the Grand Canyon region. Hence I shall make no further reference to them here. My reason for giving so much space to Ashley has been merely to offer a sample of the kind of experiences the trappers of the early days met with, in trying to solve the problem of the canyons of the Colorado River.

Lieutenant Ives' Expedition. Lieutenant Ives' expedition, however, reached into the very heart of this country. He visited the Havasupais in their canyon, also the Wallapais, and traversed the weary miles across the desert to the villages of the Hopi. Steamboats had plied up and down the Colorado River from the Gulf of California as far as Fort Yuma—near where the present railroad bridge crosses the stream—but Ives was instructed by the War Department to explore the river further up, in order to determine whether the military posts of New Mexico and Utah could be reached, and their supplies transported by the Colorado. Instead of calling upon Captain Johnson and chartering his steamboat, the Colorado, Ives ordered his steamer constructed in Philadelphia, and shipped in sections via the Isthmus of Panama to San Francisco, and thence around Cape Lucas into the Gulf of California, to the mouth of the Colorado River. Yet he was able to report, doubtless with a clear conscience, that Johnson's company "was unable to spare a boat, except for a compensation beyond the limits of the appropriation."

Ives' Report and Accompanying Pictures. Ives' report is a most interesting document, and the pictures that accompany it, made by Mollhausen and Eggloffstein, especially those of the latter artist, are wonderful in their imaginative qualities. They are no more like the Grand Canyon than are the visions of Dore, yet they afford a good idea of the impression its vastness and sublimity made upon an artistic mind.

Starts up the River. Ives ascended the river, passing Johnson on the way in the Mohave Valley, a few miles above the Needles. The latter had gone to ferry Lieutenant Beale and his outfit across the river. So in reality he was ahead of Ives, for he entered the Black Canyon to the highest point attainable by steamers before Ives did, and thus got the better of the man who had refused to hire him and his steamer.

Journey Is Abandoned. But Ives went on as if Johnson had never existed, "discovered" what was already known, viz.: that the river "was flanked by walls many hundreds of feet in height, rising perpendicularly out of the water, the Colorado emerging from the bowels of the range," and then struck a sunken rock, and had to give up in disgust.

Returns East across Country. Sending his vessel, the Explorer, back to Fort Yuma under the command of Robinson, its efficient captain, the gallant lieutenant now struck out across country, having received new supplies and his pack-train. Under the guidance of an intelligent Mohave Indian, Ireteba, they reached Diamond Creek, and there not only came in contact with the Wallapais, but for the first time saw the Big Canyon, as they called the Grand Canyon. He then pushed on east, entered Havasupai (Cataract) Canyon, visited the Indians there, then made a wide detour to examine the San Francisco peaks, struck east again, crossed the Little Colorado, and reached the province of Tusayan, where dwell the Hopis. After a short visit there, he crossed south and east to Fort Defiance, and finally returned east with his report. When the Civil War broke out, Ives joined the Confederate forces and was killed in one of the battles.

Ives's Prediction. As an evidence of the folly of making predictions in regard to what the future has in store for any region, let me quote one paragraph from Ives which always has amused me:

"This region can be approached only from the south, and after entering it there is nothing to do but to leave. Ours has been the first, and will doubtless be the last party of whites, to visit this profitless locality." Yet Ives enjoyed the Canyon, and wrote some truly eloquent descriptions of it. How surprised he would be could he come back now, approach it from the north, cross the river in a steel cage, and find at El Tovar such an hotel as even the city of Washington never surpassed in Ives's day. Then,

taking the Grand Canyon Railway, he could speed to Williams, and in twenty-four hours reach the Pacific, or in four days the Atlantic. We march forward with great strides in these days.

Powell's Preparations for His Life-Work. Even at the time of his writing (1858), John Wesley Powell was being prepared to bring Ives's words to naught. Born March 24, 1834, at Mount Morris, Livingston County, New York, he found himself in 1858 at Wheaton, Illinois, engaged in making a conchological collection for the Illinois State Natural History Society. While engaged in this work, he also secured collections in botany, zoology, and mineralogy. His mind now opened to perceive that all these sciences were related to the greater science of geology, and thenceforward he declared that this should become his lifework.

Experiences in Civil War. During the Civil War, he fought with bravery and honor, losing an arm at the battle of Shiloh, April 6, 1862. When Sherman began his march to the sea, Powell was given command of twenty batteries of artillery. He served on the staff of General Thomas at the battle of Nashville, and was mustered out in the early summer of 1865. Even during these exciting years, his beloved science not only never lost its attraction for him, but he utilized every possible opportunity to add to his knowledge. He made a collection of fossils unearthed in the digging of the Vicksburg trenches, and from the Mississippi swamps gathered land and river shells. In Illinois, while on detached service, mosses engaged his attention, and he was indefatigable in studying the geology of the region through which his section of the army passed.

Begins Geological Explorations in Colorado. After the war he declined a lucrative political office to take the chair of geology in the struggling Wesleyan University, of Bloomington, Illinois. He had married his cousin, Emma Dean, in 1862, and, after a glimpse of the country in 1867, he took her and a party that he had organized, to make geological explorations in Colorado. This was the beginning of his work that ultimately wrested the secrets from the mysterious canyons of the Colorado River. This preliminary work led him on, as it were, to the greater work, and in 1869, on May 24, with four boats, the Emma Dean, Kitty Clyde's Sister, Maid of the Canyon, and No-Name, and nine companions, John C. Sumner, William H. Dunn, Walter H. Powell, G. Y. Bradley, O. G. Howland, Seneca Howland, Frank Goodman, William R. Hawkins, and Andres Hall, he set forth from Green River City. The simple records of that trip, and a later one made in 1871-1873 (in which Frederick S. Dellenbaugh, the author of "The Romance of the Colorado River", was engaged, read like a romance. A condensation of them is but an aggravation. No one interested in the Canyon should neglect to read them, and I am now arranging to republish Powell's original monograph, together with his monumental work on "The Canyons of the Colorado", the plates of which I purchased at his death for this purpose.

Powell's First Expedition. In the first expedition, the party was from May 24 to August 30 passing through the Canyon system, from Green River City to the mouth of the Rio Virgen. On the first of September, four of the men, with a small supply of provisions, resumed their journey on the river to Fort Mohave, while Powell and his brother returned to civilization by way of Salt Lake City.

Second Expedition. Though chapter nine of Powell's report as published by the Government, speaks of the "continuation of the explorations" of the Canyon, and gives an account of the studies made in and around the region of the Virgen River, and chapter ten contains Professor A. H. Thompson's "Report on a Trip to the Mouth of the Dirty Devil River," there is nothing in the volume that suggests the magnitude of the second trip through the Canyon. This great omission Mr. Dellenbaugh supplies in his complete narrative before referred to.

Powell's Work on the Canyon Completed. This time three boats started, the Emma Dean, Nellie Powell, and Canyoncita, manned by S. V. Jones, J. K. Hilliers, F. S. Dellenbaugh, A. H. Thompson, J. F. Steward, F. M. Bishop, F. C. A. Richardson, E. O. Beaman, W. C. Powell, and A. J. Hattan, with Major J. W. Powell, of course, as leader and director. The start was made from Green River City, Wyoming, as before, and the date was May 22, 1871. On the third of September, the mouth of Kanab Canyon was reached, where, on account of high water, the trip for the time being was abandoned. The topographical work of the survey of the surrounding country was continued through to the winter of 1873, when the maps were completed, and Powell's great work on the canyons and tributary country practically brought to a close.

Wheeler's Expedition in 1871. Another interesting Colorado River expedition was that of Captain G. M. Wheeler, made in the fall of 1871. It was doubtless an offset to that of Major Powell, as in those early days there were three separate geographical surveys in the field, working independently and without common guidance. Hence it was natural that there should have been some degree of rivalry. Captain Wheeler started up the Colorado River from Camp Mohave, in three boats that had been specially made in San Francisco, and with a barge loaned by the commanding officer at the fort. Dr. G. K. Gilbert was the geologist of the party. From September 16 to October 20, they had a difficult, arduous and occasionally thrilling journey, reaching the mouth of Diamond Creek at the latter date.

Diamond Creek is a point on the Canyon which used to be largely visited. It is reached from Peach Springs, but the scenery is far less impressive than at any of the more accessible points described in this book.

Brown's Unsuccessful Expedition. Seventeen years after Powell, Frank M. Brown, a Denver capitalist, determined to survey the canyons with the purpose of building a railway through them to the Gulf of California. The main start was made May 25, 1889, from the Rio Grande Western's tracks across the Green River, with six boats and sixteen men. It was a disastrous expedition. Brown himself lost his life at Soap Creek Rapids, some fifteen miles below Lee's Ferry, and four days later two others were drowned in Marble Canyon. The expedition was then abandoned, the remnant of the party climbing the Canyon walls, and finding their way back to civilization assisted by the kindly owner of a cattle ranch.

Stanton's Boats Travel Through the Whole Canyon System. In November of the same year, however, Robert Brewster Stanton, Brown's engineer, observing precautions that Brown had so unfortunately neglected, prepared to continue the exploration. He had his boats hauled on wagons to the mouth of Crescent Creek near Fremont River, to avoid a repetition of the experiences in Cataract Canyon; and a good start was made. The party ate Christmas dinner at Lee's Ferry, and a few days later, slightly below where Brown lost his life, the photographer of the expedition fell from a ledge and broke his leg. With incredible labor, the unfortunate man was got out of the Canyon, four miles in distance and seventeen hundred feet in altitude, on an improvised stretcher, and then taken in a wagon which Stanton had fetched from Lee's Ferry. The party then went on, entered the Grand Canyon, and reached Diamond Creek March 1, where they remained ten days recuperating. The last dash was then made in safety. The boats left the Canyon March 17, 1890, and proceeded easily and gently, until on the twenty-sixth of April tide-water was reached at the mouth of the river on the Gulf of California.

Galloway Repeats Stanton's Exploit. On January 12, 1897, N. Galloway, a Mormon trapper, who for years had operated on the Canyons of the Green River, determined to emulate Powell and Stanton. He made two light boats of rude lumber, covered them fore and aft with canvas, got a companion, William Richmond, and on the day named left a point near the state line of Wyoming and Utah. On the third of February they emerged from the Canyon. As they reached the open country below the Grand Wash, they came upon the officers who had found the bodies of two men, killed by Mouse, a Paiuti Indian. The officers requested the use of Galloway's boats to convey the bodies to the Needles. This was acceded to, and on the seventeenth of February Needles was reached, the boats sold, and the Mormons returned to their homes.

Making Photographs of Soap Creek Rapids. Later in the same year, I made the trip by wagon from Winslow, Arizona, over the Painted Desert to Lee's Ferry, and there, to my great delight, met Galloway. He built a boat, and took me up Glen Canyon for a long distance, and down Marble Canyon to Soap Creek Rapids, where poor Brown was lost. As I photographed the rapid, he offered to "run it" in his boat if I desired, saying that, with his light boat, there was no danger whatever. I declined, however, on the ground that no photograph ever made could justify the risking of a man's life. As recently as August, 1908, in coming to the Canyon by rail, I met at Kingman, Arizona, a deputy sheriff by name of Ayres, who was one of my party taken by Galloway up the Glen Canyon.

In the Fall of 1909, Mr. Galloway accompanied an Eastern capitalist, Mr. Julius Stone, of Columbus, Ohio, in boats of their own manufacture, through the Canyons, from Green River to Needles, California. They had a delightful, though an arduous nine weeks trip. Mr. Stone secured the finest set of photographs of the Canyons as a whole that ever have been made.

In another chapter, entitled "The Story of a Boat," the interesting account of the successful trip of Russell, Monett and Loper is given.

CHAPTER XXVII. Indian Legends About The Grand Canyon

Legendary lore is generally interesting. It reveals the mental qualities of the people who make and believe it, and also shows how the child mind of the race acts. For the aboriginal makers of legends are the child minds of the race in active operation. There are many legends attaching to this great Canyon. One is told by Major Powell in his "Explorations" as follows:

Legend of the River's Birth. "Long ago, there was a great and wise chief, who mourned the death of his wife and would not be comforted until Ta-vwoats, one of the Indian gods, came to him and told him she was in a happier land, and offered to take him there, that he might see for himself, if, upon his return, he would cease to mourn. The great chief promised. Then Ta-vwoats made a trail through the mountains that intervene between that beautiful land, the balmy region in the great west, and this, the desert home of the poor Numa.

"This trail was the canyon gorge of the Colorado. Through it he led him; and, when they had returned, the deity exacted from the chief a promise that he would tell no one of the joys of that land, lest, through discontent with the circumstances of this world, they should desire to go to heaven. Then he rolled a river into the gorge, a broad, raging stream, that should engulf any that might attempt to enter thereby.

"More than once I have been warned by the Indians not to enter this canyon. They considered it disobedience to the gods, and contempt for their authority, and believed it would surely bring upon one their wrath."

Hopi Legend of Tiyo, their Cultus-Hero, and the Canyon. One of the most interesting legends of the Hopi cultus-hero, Tiyo, relates to the Grand Canyon of the Colorado River, and is told by Dr. J. Walter Fewkes, the eminent authority on the ethnology of the Hopis. It is a long story, but the chief portions of the narrative are as follows:

Origin of Antelope and Snake Clans. "Far down in the lowest depths of the Grand Canyon of the Colorado River (Pi-sis-bai-ya), at the place where we used to gather salt, is the Shipapu, or orifice where we emerged from the underworld. The Zunis, Kohoninos, Paiutes, white men, and all people came up from 'the below' at that place. Some of our people traveled to the North, but the cold drove them back, and after many days they returned. The mothers, carrying their children on their backs, went out to gather seeds for food, and they plucked the prickly pears and gave it to their children to still their cries, and these have ever since been called the Prickly Pear People.

"'Morning Dove' flew overhead, spying out the springs and calling us to come, and those who followed him, and built their houses at the waters he found, are still called after him the Hu-wi-nya-muh, or Morning Dove People. All that region belonged to the Puma, Antelope, Deer and other Horn people, and To-hi-a (puma) led my people, the Tohi-nyn-muh, to To-ko-na-bi (Navaho Mountain), and the Sand people and the Horn people also dwelt in the same region.

"We built many houses at To-ko-na-bi, and lived there many days, but the springs were small, the clouds were thin, rain came seldom, and our corn was weak. The Ki-mon-wi (village chief) of the To-hi-nyn-muh had two sons and two daughters, and his eldest son was known by the name of Tiyo (the youth). He seemed to be always melancholy and thoughtful, and was wont to haunt the edge of the cliffs. All day he would sit there, gazing down into the deep gorge (of the Grand Canyon), and wondering where the ever-flowing water went, and where it finally found rest. He often discussed this question with his father, saying, 'It must flow down some great pit, into the underworld, for after all these years the gorge below never fills up, and none of the water ever flows back again.' His father would say, 'Maybe it flows so far away that many old men's lives would be too short to mark its return.' Tiyo said, 'I am constrained to go and solve this mystery, and I can rest no more till I make the venture.' His family besought him with tears to forego his project, but nothing could shake his determination, and he won them to give their sorrowful consent.

"The father said, 'It is impossible for you to follow the river on foot, hence you must look for a hollow cottonwood-tree, and I will help you make a wi-na-ci-buh (timber box) in which you may float upon the water.' Tiyo found a dry cottonwood-tree, which they felled, and cut off as long as his body, and it was as large around as they both could encompass with their outstretched arms. They gouged and burned out all of the inside, leaving only a thin shell of dry wood like a large drum; small branches and twigs were fitted in the ends to close them, and the interstices were pitched with pinion gum. All this work was done with the stone axe and the live ember.

"The father then announced that in four days Tiyo should set forth, and during that time the mother and her two daughters prepared kwip-do-si (a kind of corn meal made from corn which has been dried and then ground. A thin gruel is made of it) for food, and the father made prayer emblems and pahos. On the morning of the fifth day the father brought the emblems to Tiyo and laid them on a white cotton mantle, but before he wrapped them up, he explained their significance. He also gave him a wand to be used in guiding his box-boat, after which Tiyo crept into the box, received from his mother and sisters the food, and then his father closed the end of the box, gave it a push with his foot, and it floated away, bobbing up and down.

"In one of its ends there was a small circular aperture, through which he thrust his wand, and pushed away from the rocks which were encountered. The spray splashed through the opening, and this he caught in his basin when he wished to drink or to mix his kwip-do-si, and he was also provided with a plug to close the hole when he neared the roaring waters. He floated over smooth waters and swift-rushing torrents, plunged down cataracts, and for many days spun through wild whirlpools, where black rocks protruded their heads like angry bears.

"When the box finally stopped Tiyo drew the plug, and looking out saw on one side a muddy bank,

and on the other nothing but water; so he pushed out the end, and taking his paho mantle in his hand passed to the dry land. He had gone but a little way when he heard the sound of 'hist! hist!' coming from the ground, and when this had been repeated four times, he descried a small round hole near his feet, and this was the house of Spider-Woman.* 'Um-pi-tuh,' said the voice ('you have arrived,'—the ordinary Hopi greeting). 'My heart is glad; I have long been expecting you; come down into my house.' 'How can I,' said Tiyo, 'when it will scarce admit the point of my toe?' She said, 'Try,' and when he laid his foot upon the hole, it widened out larger than his body, and he passed down into a roomy kiva."

* Spider-Woman is an important figure in Hopi mythology. She it is who weaves the clouds so that rain may come. Hence in many Hopi ceremonies, where rain is prayed for, she is especially propitiated.

The legend then goes on to describe how Tiyo is taken and guided by the Spider-Woman to various places, where he learned all about the ceremonies that the Hopis now perform at their Snake Dance to produce rain. He met the Sun and the Great Snake (Go-to-ya), and Mu-i-yin-wuh (a divinity of the underworld who makes all the germs of life), and each taught him something he needed to learn. Finally, after many wonderful adventures, he was lifted out of the underworld as he sat in a ho-a-pah, a kind of wicker pannier, with two beautiful maidens of the snake kiva, by Spider-Woman, who carried him over the country and deposited him at his home. He married one of the maidens and thus founded the Snake Clan, and his brother married the other and founded the Snake-Antelope Clan. These two clans each year perform the ceremonies that produce rain in the desert land, where still live the descendants of Tiyo and his brother.

Wallapai Legend of the Canyon. The Wallapais say that it was one of their cultus-heroes, Pack-i-tha-a-wi, who made the Grand Canyon. There had been a big flood, and the earth was covered with water. No one could stir but Pack-i-tha-a-wi, and he went forth carrying a big knife he had prepared of flint, and a large, heavy, wooden club. He struck the knife deep into the water-covered ground and then smote it deeper and deeper with his club. He moved it back and forth as he struck it further into the earth, until the canyon was formed through which all the water rushed out into the Sea of the Sunset. Then, as the sun shone, the ground became hard and solid, as we find it to-day.

The Havasupai Legend of the Canyon. The Havasupais also have a legend connected with the making of the Grand Canyon, and the reader will observe with interest the points of the story that are similar to points in the Hopi story just given. This story was told to me by O-dig-i-ni-ni-na, one of the old men story-tellers of the Havasupais.

"The two gods of the universe are Tochopa and Hokomata. Tochopa he heap good. Hokomata he heap bad—hanatopogi—all same white man's devil. Him Hokomata make big row with Tochopa, and he say he drown the world.

"Tochopa was full of sadness at the news. He had one daughter whom he devotedly loved, and from her he had hoped would descend the whole human race for whom the world had been made. If Hokomata persisted in his wicked determination, she must be saved at all hazard. So, working day and night, he speedily prepared the trunk of a pinion tree by hollowing it out from one end. In this hollow tree he placed food and other necessaries, and also made a lookout window. Then he brought his daughter, and telling her she must go into this tree and there be sealed up, he took a sad farewell of her, closed up the end of the tree, and then sat down to await the destruction of the world. It was not long before the floods began to descend. Not rain, but cataracts, rivers, deluges came, making more noise than a thousand Hackataias (Colorado Rivers) and covering all the earth with water. The pinion log floated, and in safety lay Pu-keh-eh, while the waters surged higher and higher, and covered the tops of Hue-han-a-patch-a (the San Francisco range), Hue-ga-woo-la (Williams Mountain), and all the other mountains of the world.

"But the waters of heaven could not always be pouring down, and soon after they had ceased, the flood upon the earth found a way to rush to the sea. And as it dashed down, it cut through the rocks of the plateaus, and made the deep Chic-a-mi-mi (canyon) of the Colorado River Hackataia. Soon all the water was gone.

"Then Pukeheh found the log no longer floating, and she peeped out of the window Tochopa had placed in her boat, and, though it was misty and almost dark she could see in the dim distance the great mountains of the San Francisco range. And near by was the Canyon of the Little Colorado, and to the west and north was Hackataia, and to the west was the Canyon of the Havasu.

"The flood had lasted so long that she was grown to be a woman, and, seeing the water gone, she came out and began to make pottery and baskets, as her father had long ago taught her. But she was a woman. And what is a woman without a child in her arms or nursing at her breasts? How she longed to be a mother! But where was a father for her child? Alas! there was not a man in the whole universe?

"Day after day, longing for maternity filled her heart, until one morning— glorious morning for Pukeheh and the Havasu race—the darkness began to disappear, and in the far-away east soft and new brightness appeared. It was the triumphant Sun, coming to conquer the long night and bring light into the world. Nearer and nearer he came, and, at last, as he peeped over the far-away mesa summits, Pukeheh arose and thanked Tochopa, for here, at last, was a father for her child. She conceived, and in the fullness of time bore a son, whom she delighted in and called In-ya-a, the son of the Sun.

"But as the days rolled on, she again felt the longings for maternity. By this time she had wandered far to the west and had entered the beautiful Canyon of the Havasu, where deep down between the rocks were several grand and glorious waterfalls, and one of these, Wa-ha-hath-peek-ha-ha, she determined should be the father of her second child.

"When it was born it was a girl, and to this day all the girls of the Havasu are proud to be called 'Daughters of the water.'

"When these two children grew up they married, and thus became the progenitors of the human race. First the Havasupais were born, then the Apaches, then the Wallapais, then the Hopis, then the Paiutes, then the Navahos.

"And Tochopa told them all where they should live, and you find them there to this day."

CHAPTER XXVIII. The Colorado River From The Mountains To The Sea

Perhaps no river in the world has so remarkable a life-history as has the Colorado. It is formed of two great streams, the Green and the Grand. Both have their rise in the far-away mountains, in banks of virgin and purest snow. Hence the waters of the Colorado at their source are pure and sweet. Yet such is the vehement force of this river, such its haste to reach the ocean, that it cuts down and carries with it millions of tons annually of sand and silt, rock debris and dirt until, when it reaches the desert, through which it flows as a lazy dragon, reddish-yellow, tawny, it is the dirtiest stream in the world. For not only does it carry the sand of its own grinding, as it passes through the hundred miles of canyon of its waterway, but it accepts the sweepings of vast areas made by its tributaries. Some of these extend through barren and desolate areas,—great stretches of the most forsaken desert lands, where the rains occasionally pour down with deluge-like force. Cloudbursts and floods are common; for the whole country is high in altitude, with rising peaks, where electric storms play and rage, and the clouds drop, with a sudden sweep, their whole burden of water to the earth beneath. At other times, the waters are allowed to pour down in torrential rains which quickly deluge the land, and as there are no barriers to hinder or detain, they sweep down the inhospitable slopes to the stream beds, carrying with them all the sand, silt, rock debris, vegetable mould and animal matter that have accumulated since the last storm. So that while at its source it is the purest river in the world, at its mouth it is the dirtiest and most repulsive. The Mississippi, with many more miles of length, the Nile, the Amazon, the Yangste-Kiang, the Hoang-Ho, are all far cleaner at their mouths than is this insatiable dragon of the Canyon.

Carrying Power of the River. This suggests another singularity in which it doubtless reigns supreme. Probably no river in the world, of its length, has anything like the carrying power of the Colorado within its waters. Notice that I say "within its waters." It is useless for carrying anything on its bosom. No ships use its waters for beneficent commerce. Its only carrying power is in the amount of sand and other material it holds in solution, and carries within itself.

Its Incredible Descent. For it is doubtful whether any river in the world has so rapid a descent from towering mountain heights to its receiving ocean, as has the Colorado. It falls over four thousand two hundred feet from its source to its mouth, and in less than five hundred miles of its distance it contains five hundred and twenty rapids, falls and cataracts. A fall or a rapid or a cataract for every mile, and a few over for good measure. Who can conceive the peril of journeying through such a river? And until the facts were known, how hopeless to attempt to ascend such a river, as did Alarcon, Ives and Wheeler!

Useless for Commerce. As already stated, it is the most useless of the large rivers of the world as a carrier of ships of commerce. No boat, carrying produce of field, mill or mart, has ever passed up or down its course. No whitewinged schooner or other merchantman has enlivened its course by proudly gliding on its bosom to waiting port, where cargoes are discharged and received. No thrilling fleet of battleships ever has seen its banks, or ever will, for it is useless, absolutely, irretrievably, God-ordainedly useless for all purposes of commerce, traffic, or communication.

Dangerous and Destructive. Read the accounts of Powell's trips down its dangerous course; of

Alarcon's struggles to ascend its headlong tides; of Ives's and Wheeler's attempts to explore a portion of it; of Cardenas's efforts even to reach its waters from one of its banks, and of the ruthless manner in which it has destroyed the lives of those unfortunate enough to come within its reach. Then you will see how absolutely useless a river it is. In this regard the Colorado River is unique. Most rivers carry beneficent life all along their journey. They distribute fructifying waters, from their rise to their end in the sea. Thriving towns and villages line their banks, all surrounded by a fertile farming country. But not so the Colorado! It has cut its way through the rocks so fiercely that it is buried a thousand, two thousand, three thousand and even five thousand and more feet below the surrounding country. It and its tributaries drain away even the water that falls in gentle showers, before it has time to benefit the thirsty land. Only by the expensive construction of cemented cisterns and occasional dams can the rancher, stockman and miner of the region hoard for his scantest needs enough of this precious fluid. Even the hotels that are placed upon its brink to afford stopping-places for the curious travelers who wish to see this river and its unique waterway are compelled to haul their trains of water-cars nearly a hundred miles to supply themselves with the water which the Colorado River drains from their very dooryards and empties in reckless neglect into the Gulf of California.

Yields No Electrical Power. Other rivers throughout California and the West are yielding millions of volts annually of electrical energy, for the lighting and heating of cities, the turning of mill-wheels, and the running of electric cars; but the Colorado, though possessed of a potential energy greater than any ten or twenty of these rivers combined, so far has refused to yield up a single volt. Again and again engineers have estimated and suggested, but the great facts remain that it is so uncertain, so wild, so impetuous, so sure to rise when unexpected, so sure to fall when relied upon, that, as yet, no one has been found venturesome enough to try to tame and harness its fierce energy.

Waters to be Diverted by a Dam. Yet in spite of these serious charges I make against the Colorado, it is peculiar in that it is the most useful of the large rivers of the world in another domain. The United States Reclamation Service has spent millions of the people's money in making it of use. At Laguna, a few miles above Yuma, it has built a huge dam larger than any similar dam in the world—that diverts these once turbulent waters into irrigating ditches to convey their life-giving power to thousands upon thousands of acres of desert land. The Blythe Estate is doing the same thing a hundred or more miles higher up, near Parker, on the Santa Fe, and already towns and settlements are springing up on those desert wastes. The California Development Company began this work, four miles below Yuma, in 1900, and in four years had converted that great sink of the Colorado Desert into the richly fertile domain now known as the Imperial Valley, where today are many growing towns.

Opportunities for Swimming. Though the current of the Colorado is so strong, there are times and places where it affords one who is not over-fastidious as to the color of the water, an opportunity for an excellent swim. But care must be exercised. At the foot of Bass Trail, there are two or three rocky recesses where one may go in and swim, within the arms of the protecting rocks, without danger. It is not well to swim in the earlier months of the year, when the water is excessively cold. Several times in January and February I have been overcome with temptation, and have jumped in "merely for the plunge." The sensation is one of being skinned alive, and one plunge is all that one cares for. Yet on emerging and dressing, how fine one feels after it. The great melting time of the snows on the mountains is the end of May, June and early July. It grows warmer in July, and from then on to December one may enjoy it. In September and October it is generally deliciously warm, and I have gone in half a dozen times a day. A good swimmer can cross the stream, if he does not lose his head, for the current is powerful, and one is borne down far faster than he imagines, and it is much further across than it seems to be. Several times, when I have wanted to cross, and there was no boat, I have swam across to the other side, wearing my shirt and trousers and carrying my boots slung around my neck. But it is, hard work and scarcely worth the risk.

An Exciting Swim. Last year at the foot of the Red Canyon Trail, I had two most delightful swims—one on the night of the arrival of our party, the other by starlight next morning. Though there is an ugly rapid at this place, one may go up stream far enough to get away from danger, for a half-moon-shaped mass of rock affords safe shelter, and deep enough water for swimming. The night swim was so refreshing that I could not resist the allurement to take another in the morning, before we left camp. The order had been given for an early start, which meant breakfast at earliest dawn, so that I had to go down to the river while the stars were yet shining. The water was quite warm, and as soon as I felt myself in its soothing embrace a half-dreamy mood came over me, and, throwing myself upon my back, I yielded to it, quietly pushing myself, as I thought, against the stream, but heading for the other side. Though conscious of the enjoyment of the exercise, and the delicious sensation of the water around my body, my thoughts ran away with me, and I suddenly awoke to myself and the full significance of my surroundings by finding myself more than half-way across the river, in the swiftest part of the current, which was rapidly carrying me down to the rapids. For a few moments I was dreadfully alarmed. My heart stood still, and the surprise of it almost paralysed me. I remember distinctly my thoughts and

reasoning. They were somewhat as follows: "The current on the south side is far less strong than on this side. Therefore it will be much easier to go back than to try to reach the north shore, which seems to be and is so much the nearer. If, however, you can't make it, what then? You'll go into the rapids. If you are dashed headlong or sideways against any of the five hundred and one waiting rocks, that will doubtless be the end of you; but there is a good chance that you may get through without hitting anything. A minute, or two minutes at the most, will see you through the rapids to calm current beyond. You can hold your breath that length of time, so that the spray and wildly tossing waves of the rapids, the froth and spume, will not get up your nose and choke you."

In the meantime, I had fixed my eye on an immense square block of rock, that rested just above the dangerous rapids, and close to the southern shore. I knew if I could reach the shore inside that rock I was safe, so striking out vigorously, and aiming for a point far above it, I swam as strongly as I knew how, making every stroke tell, refusing to be alarmed or confused by the terrifying roar of the rapids, which now seemed but a step away. I did not have to test my method of going through the rapids. I reached the shore in safety, walked back to camp, had a good breakfast, made all the more appetizing by my swim and the consequent danger, and in half an hour the ride up the trail and my companions were absorbing all my attention. To all of them, save one, this recital of my morning's adventure will be new.

Dangerous Unless Known Well. That the river is more dangerous than most people imagine, the bleaching bones of many a poor wretch who has been drowned in its treacherous waters fully attest. More than one prospector, cattleman, or even cattle and horse "rustler" (as in Arizona parlance a cattle and horse-thief is known), with too great self-confidence, has attempted to cross on a log, in a leaky skiff, or in a canvas boat, and ere he was aware of his danger, the current had swept him out of reach of all help. It is a river to know ere you risk yourself upon or in it.

Getting Animals across the River. Who could begin to recount the fun and frolic, and at the same time the worry and vexation we have experienced in taking horses, mules and burros across this surly river. We have crossed at all times of the year, at high water and low, when the water was cold enough to give one cramps merely to look at it, and when it was comfortably warm. Sometimes we had no trouble; then we felt how smart we were, and it made us happy; at other times the animals seemed to be "possessed." Sometimes it is the horses that are afraid; at others it is the mules; and sometimes the burros; generally all three together. The modus is to put your strongest rower in the boat, and then a man with plenty of nerve in the stern to handle the rope and the animal to which it is attached,—when you get the latter into the water. As many persons as then can be assembled get behind the animal to persuade it to enter the water. The boat is ready to go as soon as the animal is "in," but yet it prefers to be "out." Yellings, shoutings, pushings are of little or no avail, and the gentle pleadings of the man with the rope are as effective as Mrs. Partington's sweeping back of the Atlantic with a broom. Vigorous measures must be used, so a concerted movement is projected. At a given signal the boat is to be pushed off, the oarsman ply his oars with power, the man in the stern is to pull with energy, and a man at each flank of the animal is to push, while every other being is to do his or her part by a shout or a boost. One man swings a riata to help scare the animal in, and the boat pulls out into the current. We all stand and watch. What is the fool horse doing? Scared at first of going into the water, he now is making desperate efforts to climb into the boat. His rope is held as tightly as possible, but the beast swims frantically from one side to the other, endeavoring to climb aboard. His knees thump the boat, and his chin occasionally rests on the gunwale, but active interference thrusts him back. In the meantime, the current is taking the boat well down the river, but we are not alarmed, for we have a good half-mile stretch, with convenient sandy places on the north side, on which to land. Now the horse settles down to steady hard work, and at last, catching sight of the tiny beach, he breaks away from the boat and strikes out for himself, reaching shore before the rower.

Back they come for another. Now we try two burros. Firmly they brace themselves, and refuse to be pushed into the tawny flood. Then they dodge and run and tangle each other up with their neck ropes, patiently strangling each other with desperate insistence. At length they are pushed in, and off they go. After a good ducking, they come up with a snort and a bounce, a look of martyr-like meekness in their eyes, as they settle down to the inevitable. No animal on earth can teach man more than a burro in this regard. He accepts what can't be helped, makes the best of it, and gains happiness out of every patch of thistles and grass he can push his nose into. So, as we look into the eyes of these burros, as they rapidly "paw" the current, we can see a look of expectation and content which plainly says "Cheer up, brother, this will soon be over, and on the north side we'll get better feed than we've been having lately."

A mule's desperate plunges to escape generally aid us to get him into the water, for he loses his balance and is easily pushed in. But his look of dazed surprise is comical when, after such a plunge, in which he sinks below his head, he arises, snorts, blows the water out of his nostrils, and begins to look about him. The burro part of his nature, however, soon settles him down, and he pulls out for the shore,

glad to rejoin his companions.

Once in a while an animal breaks loose, gets halfway across, becomes confused, and not knowing which way to go, is carried down to the rapids and dashed to death.

CHAPTER XXIX. Climate And Weather At The Grand Canyon

Difference between Rim and Canyon. The climate at the Grand Canyon refuses to be defined in a paragraph. What is true of the country along the rim is not true of the banks of the river itself. The midway region, half-way down the trail, likewise has a climate all its own. For as you go down in summer, the thermometer goes up; and as you come up, in winter, the thermometer goes down. The difference of nearly a mile in altitude between the surface of the Colorado River and the rim of the Canyon is equivalent to going hundreds of miles north and south on the level. Hence it is that when it is winter on the rim, it is like spring down in the depths; when it is spring on the top of the world, the heat below is tropical.

Weather not Extreme. Bear in mind, though, that neither the cold of winter nor the heat of summer, in northern Arizona, are as frigid or as torrid as the readings of the thermometer may seem to indicate. The cold or heat is not felt to such an extreme as in the East. A minimum of humidity is the basic reason for this wide difference between, for example, the July or January climate of New York, and the July or January climate of the Grand Canyon. Extremes that in New York drive people to the cool seashore or To California's winter warmth, here bring no discomfort. You don't feel the weather changes so much, just because the air is so much dryer.

Mild in Summer and in Winter. Again, the altitude of the Grand Canyon rim—in places nearly a mile and a half above sea-level—makes the summers cooler than the latitude would indicate. It is ten degrees cooler, in July, at Flagstaff, Arizona, than at Salt Lake City, three hundred miles north in Utah. In turn, the southerly location of this titanic wonderland causes the winters to be milder than in Colorado, Utah and Montana.

Average Condition. Visitors should bear in mind that the Grand Canyon is an all-the-year-round resort. Unlike the Yellowstone and many other far west scenic playgrounds, one may visit there with comfort any time of the year. While certain periods are more favorable than others for outdoor life, each season has its distinctive joys.

As a rule, this part of Arizona is a true land of sunshine. Sunny days are largely in evidence.

As a rule, the air is dry. Even the rains don't soak it through.

As a rule, except on the edge of the rim, the wind velocity is under the average.

As a rule, one may ride, walk or loaf outdoors, without fear of overexertion. The air is like wine, it builds one anew.

Yet the weather is not perfect. You may strike a small sandstorm in midsummer. You may hit a blizzard in midwinter. A torrential shower may drench you. A fervent sun may unduly tan you. But these deviations from Paradise come only occasionally; they are the bitter that makes the sweet more sweet.

I can safely promise you, nine times out of ten, pleasanter weather than you would find if at home. And that is the best test.

Rest-cure. Those who visit the Canyon oftenest and stay longest find the least fault with its weather. For myself, I never complain; rather I always look forward with great joy to an outing here. For besides being an unparalleled scenic spectacle, the Grand Canyon is the greatest of rest-cures. I know of nothing better for tired nerves and worn-out bodies than to summer or winter along its rim, and down below where the river runs.

Because the weather one year never is like the year before or after, I cannot accurately forecast what you will find of heat or cold, wet or dry, when you visit the Canyon. Even the "weather man" is not infallible in his predictions. I only can outline a reasonable average, resting upon observations made during a score of years.

Winter Months. From late in November to the end of April, snow may be expected at any time on the rim, though many of the most delightful days of the year occur in these months. Snow usually does not fall until after Christmas. Some years the winter is almost snowless; other years there is enough snow to make fine sleighing. June and July are the warm summer months, with August hot; but the heat is

likely to be tempered by the rain. From the middle of July to about the end of October, rains may be looked for at any time, and the days after the rains are generally cool, delicious and altogether desirable. Now and again, both before and after a rain, the air will be moist and sultry, somewhat as it is in the East, but this condition is so rare as to cause surprise. Generally the air is dry, and the sun shines warmly, so that "catching cold" is infrequent.

Late Fall Most Pleasant. In my varied experience at the Canyon, I have found the months of September, October, and November most agreeable in spite of an occasional hot day in September. January and March are often perfect months, and while there may be a little (or much) snow on the rim, I regard the winter as the most delightful time for trips into the Canyon. The snow may make the trail slippery and disagreeable for the first mile or so, then one reaches the dry and snowless region where, practically, snow never falls, yet where the heat from radiating rock walls is tempered and subdued by the coolness from the snow above.

May Good for Visitors. May also is a good month for visitors, with more possibilities of agreeable days than February or April, though the warm days begin to come on apace soon after the middle of the month.

Fog in the Canyon. Upon rare occasions, fog banks sink into the Canyon deeps, and even now and again completely hide it from view. Do not let such a sight disappoint you. The fact is, you are being highly favored. If you will but exercise patience, you will see many marvels when the sun begins to work upon the fog. Slowly the great mass begins to show signs of uneasiness; large and small masses become broken off, and struggle as if to ascend; then, stretching apart as one stretches a mass of white cotton-batting, they are speedily dissipated into mist, and disappear. Below, in the deeper reaches, the fog rolls and tosses as if sleeping uneasily in its rocky bed. Great detached masses of rock that the eye had not been able to discern before are now made clear, the white fog behind them revealing their outlines in startling clearness. Indeed a fog may be called "the great revealer of the inner mysteries of the Canyon." It certainly shows forth more of the separating walls and canyons, and the detached buttes, than the most observant can discover in a month, without its presence.

Clouds and Rain. There are times, in August and September, when rain is to be expected, that the whole heavens are patched over with clouds. The sun shines on and through them, and the atmosphere becomes murky and sultry to unpleasantness. Then, suddenly, there is a change in the temperature of the upper air, the moisture is condensed, and refreshing rain falls to cool and cheer the earth that before was parched and thirsty.

A Battle Royal. One morning I watched a battle of the clouds over the Canyon. The wind had been blowing hard all night. About five o'clock I arose, attracted to the rim of the Canyon by a great black cloud that seemed banked up and resting on the north rim, covering, as with a blanket of blackest smoke, the long, visible stretch of the Kaibab Plateau. By and by the sun shot piercing beams of golden glory underneath the cloud, yet, strong and powerful though they were, they could not penetrate the cloud itself. There was the great wall of the Canyon; fierce, fiery, crimson-golden rays shooting in thin streaks above, banked over and pressed down upon by a towering mass of angry clouds. The wind blew strongly and fiercely from the east, bringing fleecy-edged clouds with it. Down in the Canyon the effects were wonderful. The walls reflected the anger of the clouds, and the fire of the sun. Here and there a wall, a tower, or a pinnacle would be lit up with a golden glory, but all around was smoky and forbidding. It even seemed as if a grayish black smoke was ascending from the depths beneath, through which the sun—invisible behind the cloud above—shot lancelike beams, which silvered the smoke and made it a little more gray. On the far western walls, rich purples and reds appeared. Then, suddenly, a soft and fleecy cloud appeared in the clear blue of the morning sky, floating towards me. It was awe-inspiring and yet startling, for it came like a giant battleship, resistlessly and silently shouldering its way along. Entranced I watched it, almost inclined to run, so as to give it free course, for it was low down and apparently very near, and moving with more than ordinary speed. Suddenly another cloud appeared, travelling after the first. As it came, the earlier one veered to the north, and began to cross the Canyon, losing some of its serenity and calmness of manner as it did so; for now, either as the result of conflict from within, or silent influence from without, it began to writhe and change its shape. Ugly angles were thrust out from its hitherto smooth sides, and sent waving and tossing aloft. While this was occurring, the second cloud veered, and when I gazed again, after withdrawing my attention for a few moments, the two were one, the subtle yet powerful forces in the air having wedded them. Together they slowly floated north and east. In the meantime, other clouds had been coming from the east. They sailed along serenely until they came within what appeared to be a few hundred yards of me, and then suddenly they veered to the north, crossed the Canyon, and joined the vast army of clouds that lay in solemn quietude, waiting for the decisive battle of the day. I went away from the rim for an hour or so, and when I returned not a trace of a cloud was to be seen.

A Beautiful Fog Effect. Another morning I saw the Grand Canyon as one hears an exquisite poem, a

soft strain of music on violin, 'cello or oboe, or sung by the human voice. It was no longer terrifying and awe-inspiring; it affected one as beautiful flowers do, as the blessing of an old man or woman, as the half unconscious caress of a sleepy child whom you love. It was poetry personified; the spirit of beauty revealed; the inner glory of an artistic mystery unveiled.

There had been rain nearly all night, preceded by considerable wind. The clouds had massed together across the Canyon on the Kaibab. Winds had seemed to blow from every direction, but mainly from the southeast, and there were a few "sunshiny showers" in the late afternoon. The rain began after the sun had gone down, and it descended easily but steadily nearly all night. At six o'clock in the morning, not a glimpse of the Canyon could be had. It was completely buried, wrapped, enveloped in clouds. About nine o'clock these began to move. The rain ceased, tiny patches of blue shone through the clouds overhead, though east, west, north, south they were still black and lowering. It was cold almost to chilliness after the warmth of the preceding days, so there was no haste, no hurry, in the dispersion of the cloud blankets that covered the rocky walls and plateaus below. Slowly they began to rise, then to stretch out and become attenuated. Tiny gusts of wind played with them, and tossed them hither and thither. Banks of smoky gray lay over certain portions, but there was no regularity, no evenness, either in the clouds themselves, or in their disposition. East and west thick masses hid all vision; immediately at our feet the clouds filled the lower canyons below the plateaus, with a glorious, fleecy, silvery white, that tempted one to walk upon it into the realms of fairyland and wonder. Fleeces of irregular shape, but a mile long and two miles wide, slowly lifted themselves from a horizontal position to a vertical one, thus converting themselves from blankets into curtains. Yet behind and through them,—as a coy beauty half reveals, half conceals, her charms,—so the walls and buttes, the pinnacles and buttresses, took on a new and delicate beauty, a subtleness of charm and refinement that only such a veiling could produce. Every moment the panorama changed. This was veiled completely, that entirely uncovered, while other features were dimly discernible, or so softened by the fleecy, attenuated clouds that they seemed the airy fabrics of a child's dream of oriental splendor. Now as filmy steam, then as densest vapor boiling up from a world-deep cauldron of unearthly beauty, the moisture moved, here catching rapidly ascending currents of air, there lazily floating with serenest ease. It was hard to tear oneself away, and the mind still lingers and will often again recur to it, as one of the many never to be forgotten experiences of this most wonderful place.

CHAPTER XXX.The Grand Canyon For Pleasure, Rest And Recuperation

Unchanging Value of the Canyon. Many people think of the Grand Canyon as a show place, which, once seen, does not need to be revisited. Never was there a greater mistake, for its resources are inexhaustible, even though one visit it annually for a lifetime. The business man invests in stocks and bonds. A panic may wipe out their values and ruin follow in a night-time. But a visit to the Grand Canyon is an investment that yields interest manifold and compounded, as long as the faculty of memory remains. Better still, there is no middleman in the deal. The ticker does not reel off the changing values. You yourself are the banker, and the joys of beholding and possessing are permanent.

Its Mental and Spiritual Influence. The first impressions, maybe, are productive of physical and mental excitement. But when the traveler comes into complete harmony with the Grand Canyon's sublime features, bodily rest and mental tranquillity are sure to follow. Of course, we get out of Nature what we bring to her mentally and spiritually, but of no other place can it be truly said that the play of external forces has so sure a charm, so direct an influence. A man big mentally cannot be satisfied (when away from his work) with a place inferior to that with which he is habitually acquainted. Thus many a man, wise and thoughtful in all the other relations of his life, will go to some inferior place for his holiday, and return home dissatisfied. He has chosen unwisely. He has associated with that which is beneath him. Man's scenic environment and its influence over him are as much a matter of scientific knowledge, as the influence of his heredity or his food. A wise man, therefore, puts himself, at vacation time, in relationship with that scenic environment which will best minister to his welfare. Nature is God's provision for supplying man with his needed rest and recuperation.

Its Restful and Strengthening Qualities. Some prefer the forests, others the mountains, others the sea, others the plains, others the solitudes of the desert. Among them all in power to recuperate man's exhausted energies, the Grand Canyon stands supreme. "I come here again and again, because nowhere else do I find such rest and strength," said one of the leading men of California to me, in the rendezvous of El Tovar, only a short time ago. My own life and experience is a proof of this statement. For nearly twenty years I have been visiting the Canyon annually, and for many years there were few conveniences, such as railway and hotels. Now these are provided. One may leave his office in San Francisco, Los Angeles, Chicago or Kansas City, and in a Pullman car ride direct to the Canyon, where a few steps will lead him into one of the most perfectly equipped, yet homelike hotels in America. And there, without effort or fatigue, he comes face to face with this rest-giving, strength-producing Canyon.

As soon as a man or woman learns this, you can scarcely get him, or her, to wait the coming of the regular holiday period. The appeal of the Canyon is as strong as the "call of the wild," and that man or woman needing quiet is wisest who yields to the call, and yields often, going to the Canyon in perfect faith that it has within itself recuperative powers which it is ready to give in full measure to those who are in need.

Ways in Which to Recuperate. To those who recuperate best by contact with Nature out-of-doors, the suggestions contained in the chapters devoted to the various outing trips will be useful. Those who wish to lounge and rest, surrounded without by all the sublimity of this unequalled scene, and within by all the comforts and luxuries of a modern hotel, will find that the Grand Canyon absolutely satisfies their most exacting demands. Easy and gentle drives, with perfect equipment; over forest roads, in the restfully stimulating atmosphere of Arizona, at an elevation of nearly seven thousand feet, soothe tired brain and nerves. More vigorous horseback exercises, taken through the park-like glades and reaches of the Coconino Forest, produce perfect digestion and the restfulness of dreamless sleep. The sun tans you. You breathe a pure, thin air, laden with scent of pine and cedar. Your lungs expand, your muscles harden. Soon you are "fit for a king."

The Mecca of the Traveling World. There are many canyons, but the Grand Canyon of Arizona is the Mecca of the traveling world; and El Tovar always has the housing of the choice spirits who have run the gamut of tourist delights in other lands. This home-like inn shelters men of letters, scientists, geologists, artists and business men. Any night, in the year, on the rim of this wonderful abyss, there will be found a miniature city, with its life and sparkle, its fellowships and social converse, its bustle and abandon, and, best of all, the simon-pure democracy inherent among traveled men and women.

In magical contrast with this human centre, is the near by solitude, for one may in a moment step from the companionship of men to the isolation of the desert or mountain—at will you may be one of the crowd or a hermit.

CHAPTER XXXI. The Story Of A Boat

The Utah. Near the rim of the Canyon, at El Tovar Hotel, is a steel boat, sixteen feet long, scarred and battered, showing signs of the roughest usage, named the Utah. Here is its story:

Loper Plans to Explore the Canyon. For ten years after Galloway's first trip was made, no one was found venturesome enough to risk the dangers of the Canyon journey until the man who built the Utah and his two companions resolved to "dare and do." These men were Charles S. Russell, of Prescott, Arizona, Edward R. Monett, of Goldfield, Nevada, and Albert Loper, of Louisiana, Missouri. Russell was thirty-one years of age, Monett twenty-three, and Loper thirty-eight years.

The plan originated in the mind of Loper, in a mine in Cripple Creek, in 1899. Six years later, Loper had been attracted to the San Juan River, a tributary of the Colorado in Southeastern Utah, by the excitement created by the discovery of placer mining there. He confided to Russell his belief that the Colorado River offered much greater chances of richer placer mining.

Difficulty in Finding Companions. The men planned to make their start in the spring of 1905. But they presently discovered that the undertaking they had faced so lightly presented almost insurmountable difficulties. At the outset, the men found it was necessary to have at least one more companion if they were to accomplish their undertaking, and four men were preferable to three. But the most daring of the men they met in the mines refused to consider such a trip.

Plans Begin to Materialize. It was consequently not until April of 1908 that their long-laid plans began to materialize. Loper met Monett, a boy in appearance, seemingly not strong, and unusually quiet, as he did his day's work in the Mohawk mine in Goldfield. But that Monett was not a boy—in courage at least—and not as weak as a casual glance suggested, was presently evidenced. Loper notified Russell, then foreman of the mine near Prescott, that the third man had been found. A meeting was arranged at Green River early in September.

Boats Are Made. Three boats were made, with stout wooden frames, covered with hulls of steel plates. Each boat was decked over, fore and aft, with sheet steel covers, bolted down by means of a row of small bolts along each gunwale. Covers, on decks, reached from each end to the bulkhead placed near the center of the boats, thus leaving an open compartment, three and a half feet long, for the oarsman. All the loads were placed under cover, and securely lashed to prevent shifting. The boats were also provided with air-tight compartments in each end, and under the seat, containing sufficient air to float both boat and load, should all the other compartments be full of water. The boats were named the Arizona, the Utah, and the Nevada. Each was equipped with provisions for three months.

The Start. The start was made down the Green River, September 20. Four days later, the trio had reached the junction of the Green and Grand Rivers, the beginning of the Colorado, having covered a distance of one hundred and twenty miles. From this point to Hite, a small town near the Arizona line, the first bad water was encountered in the forty-one miles of Cataract Canyon. Loper's boat met with disasters here dashing on a rock and tearing a long rent in its side—and giving warning of the inferiority of these thin metal boats to the stout oak craft used by the Powell party. The party managed to reach Hite, however, towing the damaged boat, and there made the necessary repairs.

Loper Stays at Hite. Loper had acted as photographer of the expedition, and had the camera and the plates in his boat, when it was filled with water. Examination showed that the plates were ruined, and the camera shutter badly rusted. It was decided that Loper should remain behind at Hite, and await the arrival of a new shutter for which he had written. It was agreed that he need not be thus delayed more than two weeks, and should be able to rejoin his companions at Lee's Ferry, a Mormon settlement of three families, one hundred and forty miles below Hite, within twenty-one days.

Russell and Monett Start. Accordingly, Russell and Monett pushed ahead, and put in many days prospecting along the shores of Glen Canyon. After forty-three days of waiting at Lee's Ferry, Russell and Monett decided that if they were to complete the trip before their now rapidly decreasing supply of provisions was exhausted, they must start on without Loper, for whom they had waited more than twice the time agreed on. Friday, December 13, had no terrors for the intrepid pair, and on the morning of that day they started on down the river, with the sixty-six miles of Marble Canyon in front of them, an introduction to the two hundred and seventeen miles of the Grand Canyon below.

Their Remarkable Nerve. In telling of this stage of the journey, Russell seemed to lose sight entirely of the remarkable nerve both men showed in starting down through what is admittedly the wildest stretch of continuous bad water in the whole river. And that, too, without the third companion, who at the outset had been considered absolutely indispensable to the success of the party. Instead, he emphasized rather his belief that Loper had elected to face no more dangers, and had voluntarily remained behind at Hite.

First Seven Days Passed in Safety. In seven days they had passed the length of the roaring stream, in its descent through perpendicular walls of marble, reaching up to an average height of two thousand five hundred feet, and had come through the worst rapids to that point, without damage to either boat. At one stage there are fifty-seven falls of from sixteen to twenty feet in a distance of nineteen miles, according to Stanton's records, in which was kept an accurate count of all the rapids in the river.

Enter the Grand Canyon. They entered the Grand Canyon December 20. For the first fifteen miles below the entrance of the Little Colorado, and the beginning of the big Canyon, they found comparatively quiet water. But from this point, on to the beginning of the first granite gorge, their way was threatened with the worst falls they had met thus far. The good luck which had attended them from the start, however, still prevailed, and they managed to shoot their way safely down over the almost continuous cataracts for five long days. Christmas found them only fifteen miles above Bright Angel. In describing the manner of their celebration, Russell remarked casually that they certainly "hung their stockings"—to dry. From beginning to end of their journey, the adventurers were obliged to depend entirely for fuel on such driftwood as they could find lodged in eddies and on the rocky shores. More than one night they spent in clothes soaked through with the icy water of the Colorado, with no fire to warm them. Their Christmas camp, however, was on a narrow strip of sand, with a greater supply of driftwood at hand than they had found at any point along the river.

Dangerous Rapids. Beginning immediately below this camping place, and continuing for ten miles, the river dashes madly through that stretch of foaming water called by Stanton the "Sockdologer." To make matters worse, Russell found it impossible to follow his usual custom of "picking a trail" through the rapids. Ordinarily the elder man climbed along the precipitous sides of the Canyon beside each cataract, leaving Monett above the rough water in charge of the two boats. From his vantage point, Russell could pick out the most dangerous places, and chart a course through the rapids accordingly. But throughout these ten miles of granite, the walls are sheer and smooth for the first fifteen hundred feet of their rise. Russell could find no foothold, and the men for the first time faced the necessity of "shooting" unknown waters.

Russell's Method of Shooting Rapids. As always, Russell led the way in his boat, swinging it into the boiling current stern first—his own method of taking each cataract making the frail craft respond to his will, when possible, by a forward pull on one or the other of his oars. For half an hour the men were hurled down the seemingly neverending length of tossing waters. After the first minute, the cockpit in which each man sat was filled to the gunwales with icy water, in which the oarsmen worked, covered to the armpits. Hundreds of times great waves totally submerged them, the little boats each time staggering out from under the weight of water, only to plunge into more.

Russell Gets Safely Through. With less than a quarter of a mile still to be covered, before the less turbulent water below was reached, and just as Russell was sweeping around the last great curve beyond which he could see the placid water, he heard his companion in the rear cry out in alarm. Before he could turn to see the cause of the cry, he was driven round the curve. Mooring his boat to the bank as quickly as possible, Russell half climbed, half waded along the shore of the river, and made his way back up the side of the rapids.

Monett in Danger. Monett, his boat wedged tight between two jagged rocks, a foot below the surface of the sweeping water, was hanging desperately to the gunwale of the little craft, his body straightened out horizontal by the rush of the water about him. The boat was completely wrecked. But Russell, when he threw a rope to his companion, was astounded to see the boy work his way slowly nearer the boat, and begin to tie its contents securely with the line intended for his own salvation.

Rescued with Difficulty. Against the roar of the rapids, it was useless for Russell to call to his companion to let the provisions go and save himself. Four times the lad let Russell drag sides of bacon and sacks of beans through the thirty feet of roaring water between him and the shore, before he finally caught the rope and was dragged to safety. He had been in the water for more than twenty minutes, and was nearly exhausted when Russell lifted him to his feet.

Loss of Boat. The loss of the boat seemed at first to mark the end of their attempt to equal the record of their predecessors. But Monett insisted that they try his plan of straddling the stern of the remaining boat. "If we strike too rough water, I can always swing overboard," he urged. "And we've needed a drag that wouldn't get fouled on the rocks all along."

Reach Bright Angel. It was noon, January 6, when the trail party from the hotel on the Canyon's rim at Bright Angel, forty men and women, eating their luncheon at the river shore, saw two men swing out of the rapids two hundred yards up the river, and row leisurely toward them. In the thirty years that tourists have visited the bottom of the Canyon at this point, it is safe to assert that not one ever saw a sight like this.

Rest for Three Days. Two horses were placed at the disposal of the miners. Their clothes were torn and soaking wet, their faces covered with an undisturbed growth of beard of one hundred and ten days' accumulation. While they had planned to climb out of the Canyon at this point to mail and receive letters, they had no intention of remaining. With all their provisions now confined to the limited quarters of one boat, and with other incentives to push on with all speed possible, it was with difficulty that they were persuaded to remain at the hotel three days.

A Fresh Start. January 9 the entire community, guests and employees of the hotel, accompanied the two men to the river edge, and bade them an enthusiastic farewell. With a responding shout, the miners pushed off into midstream and headed down river. For the first time in their four months' fight against the river, the adventurers faced water too wicked-looking for them to dare. It was out of the question for both men to try to ride in the little rowboat, and the shores on each side afforded no foothold, after half the length of the rapids was passed. Russell would not leave Monett behind to shoot the rapids alone in the boat.

Attempt to Lower Boat through Rapids. Accordingly they took out all the provisions and camera (the latter obtained at El Tovar), and tried to lower the boat through the rapids by means of along rope, to which they clung from their station on the shore. The force of the current was so great, however, that to save themselves from being dragged into the water they were forced to let go the rope. The little boat shot down the whirling cataract, and the men saw it pounded against two sharp rocks below.

Boat Is Lost. To lose their boat at this point meant death. They could not climb out of the Canyon. Their only chance was to follow and overtake the boat, now floating slowly down the still water below the rapids, the forward air-tight compartment filled with water and only the stern showing. Russell made the plunge first, followed quickly by Monett. How they managed to live through these rapids is a mystery. But they struck the still water together, neither having suffered a scratch. The shores continued to be so steep they could not climb out of the water, and they kept on in their chase of the boat. When they were within one hundred yards of it, they saw it swept over the top of Boucher Rapids, and at the same time discovered a landing place on the south shore. They gave up the boat as lost, and spent the night where they were, with no matches with which to light a fire.

Boat is Recovered and Men Resume Journey. Thursday morning, as Boucher came down his trail to go to work, he found the two men, who had climbed down beside the rapids at daybreak, engaged in hauling the badly battered boat out of the water. They had found it being swept round and round in a big eddy at the foot of the cataract. Two holes in the boat's bottom amidships bore witness to its trip over the rocks. The men persuaded Boucher to go to the blacksmith shop at El Tovar, and secure the necessary material for repairs. He did so, and after everything was again on good order, the intrepid

fellows pushed off again, and continued their wild and exciting ride down to tidewater. Past Bass's Trail and under his cable crossing, past the mouth of Havasu Creek, and Diamond Creek, where over forty years before, Wheeler's party had camped; down the gorge up which Wheeler had climbed with incredible labor, they finally reached the Grand Wash, and entered the placid water below Black and Diamond Canyons, soon to find themselves at the town of Needles, where they were welcomed by the cheers of practically the whole community. A banquet was tendered them, and the one remaining boat of the expedition secured as a memorial of their adventurous trip.

CHAPTER XXXII. The Grand Canyon A Forest Reserve, Game Preserve And National Monument

Made Forest Reserve in 1893. For several years prior to 1893, the author and some of his Grand Canyon friends sought to have this scenic masterpiece preserved from desecration as far as possible. In that year President Harrison issued a proclamation declaring it a Forest Reserve, and outlining the boundaries to be included.

Homesteads. It is interesting to note that, up to the time of the issuance of this proclamation, any citizen of the United States might have located a homestead on one hundred and sixty acres of land in the Grand Canyon region. The only two old-timers who had taken advantage of this provision of the law were John Hance and P. D. Berry. The former located at or near the head of the trail that bears his name, and Berry at the head of the Grand View Trail. Both men built log houses, Hance's being a somewhat rude structure, while Berry's was a substantial building. The Hance cabin was already built when I first visited him in 1889, and Berry built his in the years 1896-1898.

Game Preserve in 1906. On November 28, 1906, President Roosevelt issued a proclamation setting aside that part of the reserve north and west of the Colorado River as a Game Preserve. To further safeguard it and protect the cliff dwellings of the ancient inhabitants from the vandalism of irresponsible excavators, who ruthlessly knocked down the walls of buildings of permanent interest, President Roosevelt, on January 11, 1908, declared it a National Monument, and on June 23 of the same year, the Game Preserve was enlarged to include the whole of the Forest Reserve.

Forest Reserve Divided in 1908. Still another proclamation was issued by President Roosevelt on July 2,1908, which divided the Grand Canyon Forest Reserve into two parts, the section north of the Grand Canyon to be known as the Kaibab National Forest, and that on the south as the Coconino National Forest.

All these proclamations may be had by addressing the Chief Forester, Department of the Interior, Washington, D. C.

*** END OF THE PROJECT GUTENBERG EBOOK THE GRAND CANYON OF ARIZONA: HOW TO SEE IT ***

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