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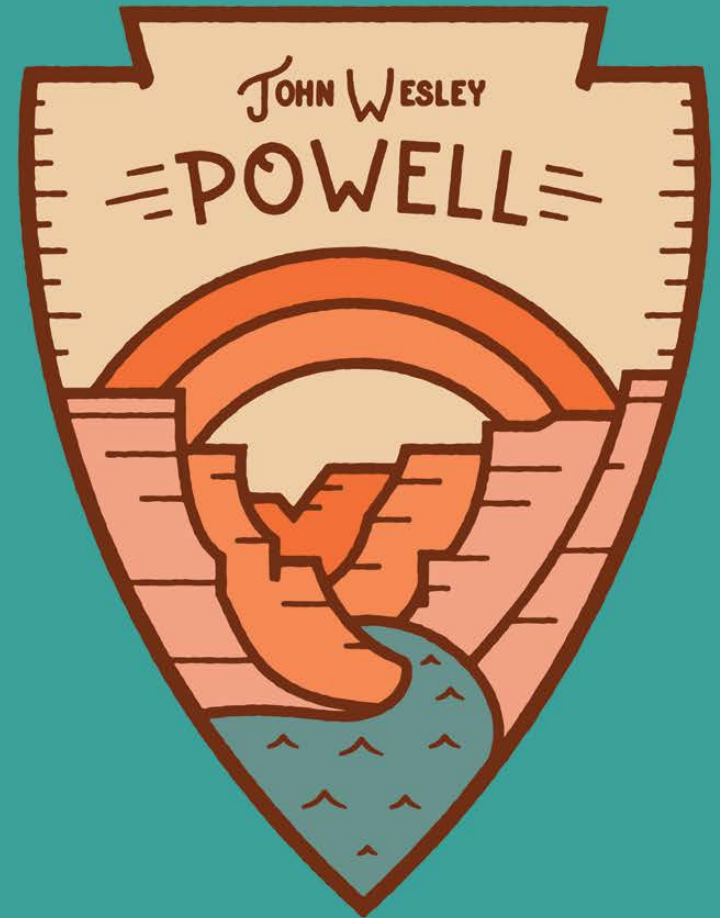


—THE—
GRAND CANYON
EXPEDITION

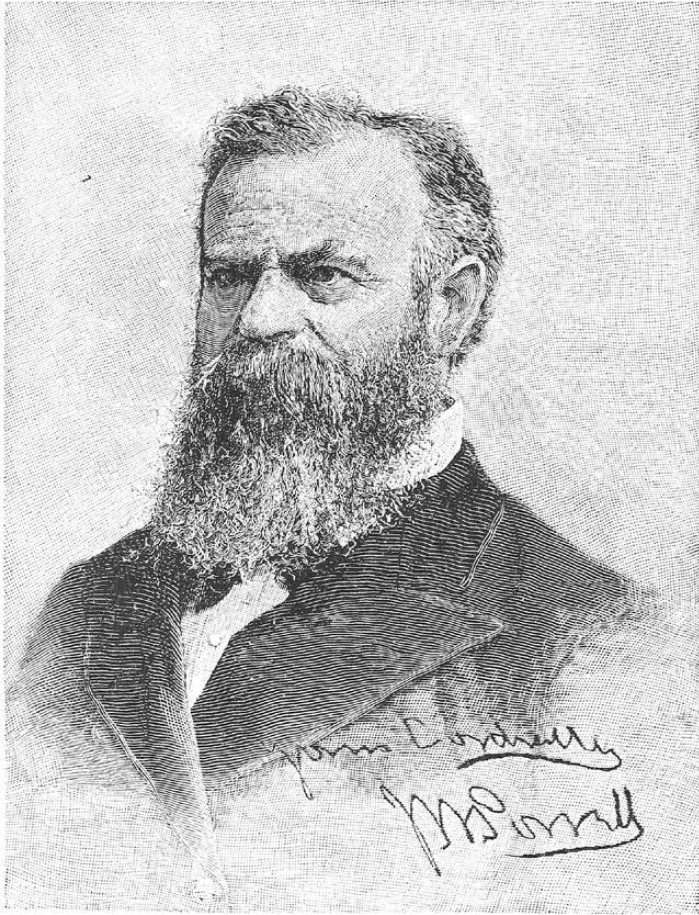
JOHN WESLEY
POWELL



GIBBS
SMITH



—THE—
GRAND CANYON
EXPEDITION



MAJOR POWELL

A large, stylized cursive signature of "John Wesley Powell" written in black ink. The signature is highly fluid and decorative, with a long, sweeping underline that extends to the left.

JOHN WESLEY
= POWELL =

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- THE -
GRAND CANYON
EXPEDITION

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THE EXPLORATION OF THE
COLORADO RIVER
AND ITS CANYONS



GIBBS SMITH
TO ENRICH AND INSPIRE HUMANKIND

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THE VALLEY OF THE COLORADO

The Colorado River is formed by the junction of the Grand and Green.

The Grand River has its source in the Rocky Mountains, five or six miles west of Long's Peak. A group of little alpine lakes, that receive their waters directly from perpetual snowbanks, discharge into a common reservoir known as Grand Lake, a beautiful sheet of water. Its quiet surface reflects towering cliffs and crags of granite on its eastern shore, and stately pines and firs stand on its western margin.

The Green River heads near Fremont's Peak, in the Wind River Mountains. This river, like the Grand, has its sources in alpine lakes fed by everlasting snows. Thousands of these little lakes, with deep, cold, emerald waters, are embosomed among the crags of the Rocky Mountains. These streams, born in the cold, gloomy solitudes of the upper mountain region, have a strange, eventful history as they pass down through gorges, tumbling in cascades and cataracts, until they reach the hot, arid plains of the Lower Colorado, where the waters that were so clear above empty as turbid floods into the Gulf of California.

The mouth of the Colorado is in latitude 31 degrees 53 minutes and longitude 115 degrees. The source of the Grand River is in latitude 40 degrees 17' and longitude 105 degrees 43' approximately. The source of the



Green River is in latitude 43 degrees 15' and longitude 109 degrees 54' approximately.

The Green River is larger than the Grand and is the upper continuation of the Colorado. Including this river, the whole length of the stream is about 2,000 miles. The region of country drained by the Colorado and its tributaries is about 800 miles in length and varies from 300 to 500 miles in width, containing about 300,000 square miles, an area larger than all the New England and Middle States with Maryland, Virginia and West Virginia added, or nearly as large as Minnesota, Wisconsin, Iowa, Illinois, and Missouri combined.

There are two distinct portions of the basin of the Colorado, a desert portion below and a plateau portion above. The lower third, or desert portion of the basin, is but little above the level of the sea, though here and there ranges of mountains rise to an altitude of from 2,000 to 6,000 feet. This part of the valley is bounded on the northeast by a line of cliffs, which present a bold, often vertical step, hundreds or thousands of feet to the table-lands above. On the California side a vast desert stretches westward, past the head of the Gulf of California, nearly to the shore of the Pacific. Between the desert and the sea a narrow belt of valley, hill, and mountain of wonderful beauty is found. Over this coastal zone there falls a balm distilled from the great ocean, as gentle showers and refreshing dews bathe the land. When rains come the emerald hills laugh with delight as burgeoning bloom is spread in the sunlight. When the rains have ceased all the verdure turns to gold. Then slowly the hills are brinded until the rains come again, when verdure and bloom again peer through the tawny wreck of the last year's greenery. North of the Gulf of California the desert is known

as "Coahuila Valley," the most desolate region on the continent. At one time in the geologic history of this country the Gulf of California extended a long distance farther to the northwest, above the point where the Colorado River now enters it; but this stream brought its mud from the mountains and the hills above and poured it into the gulf and gradually erected a vast dam across it, until the waters above were separated from the waters below; then the Colorado cut a channel into the lower gulf. The upper waters, being cut off from the sea, gradually evaporated, and what is known as Coahuila Valley was the bottom of this ancient upper gulf, and thus the land is now below the level of the sea. Between Coahuila Valley and the river there are many low, ashen-gray mountains standing in short ranges. The rainfall is so little that no perennial streams are formed. When a great rain comes it washes the mountain sides and gathers on its way a deluge of sand, which it spreads over the plain below, for the streams do not carry the sediment to the sea. So the mountains are washed down and the valleys are filled. On the Arizona side of the river desert plains are interrupted by desert mountains. Far to the eastward the country rises until the Sierra Madre are reached in New Mexico, where these mountains divide the waters of the Colorado from the Rio Grande del Norte. Here in New Mexico the Gila River has its source. Some of its tributaries rise in the mountains to the south, in the territory belonging to the republic of Mexico, but the Gila gathers the greater part of its waters from a great plateau on the northeast. Its sources are everywhere in pine-clad mountains and plateaus, but all of the affluents quickly descend into the desert valley below, through which the Gila winds

its way westward to the Colorado. In times of continued drought the bed of the Gila is dry, but the region is subject to great and violent storms, and floods roll down from the heights with marvelous precipitation, carrying devastation on their way. Where the Colorado River forms the boundary between California and Arizona it cuts through a number of volcanic rocks by black, yawning canyons. Between these canyons the river has a low but rather narrow flood plain, with cottonwood groves scattered here and there, and a chaparral of mesquite bearing beans and thorns. Four hundred miles above its mouth and more than two hundred miles above the Gila, the Colorado has a second tributary—"Bill Williams' River" it is called by excessive courtesy. It is but a muddy creek. Two hundred miles above this the Rio Virgen joins the Colorado. This river heads in the Markagunt Plateau and the Pine Valley Mountains of Utah. Its sources are 7,000 or 8,000 feet above the sea, but from the beautiful course of the upper region it soon drops into a great sandy valley below and becomes a river of flowing sand. At ordinary stages it is very wide but very shallow, rippling over the quicksands in tawny waves. On its way it cuts through the Beaver Mountains by a weird canyon. On either side grease-wood plains stretch far away, interrupted here and there by bad-land hills.

The region of country lying on either side of the Colorado for six hundred miles of its course above the gulf, stretching to Coahuila Valley below on the west and to the highlands where the Gila heads on the east, is one of singular characteristics. The plains and valleys are low, arid, hot, and naked, and the volcanic mountains scattered here and there are lone

and desolate. During the long months the sun pours its heat upon the rocks and sands, untempered by clouds above or forest shades beneath. The springs are so few in number that their names are household words in every Indian rancheria and every settler's home; and there are no brooks, no creeks, and no rivers but the trunk of the Colorado and the trunk of the Gila. The few plants are strangers to the dwellers in the temperate zone. On the mountains a few junipers and piñons are found, and cactuses, agave, and yuccas, low, fleshy plants with bayonets and thorns. The landscape of vegetal life is weird—no forests, no meadows, no green hills, no foliage, but clublike stems of plants armed with stilettos. Many of the plants bear gorgeous flowers. The birds are few, but often of rich plumage. Hooded rattlesnakes, horned toads, and lizards crawl in the dust and among the rocks. One of these lizards, the "Gila monster," is poisonous. Rarely antelopes are seen, but wolves, rabbits, and sundry ground squirrels abound.

The desert valley of the Colorado, which has been described as distinct from the plateau region above, is the home of many Indian tribes. Away up at the sources of the Gila, where the pines and cedars stand and where creeks and valleys are found, is a part of the Apache land. These tribes extend far south into the republic of Mexico. The Apaches are intruders in this country, having at some time, perhaps many centuries ago, migrated from British America. They speak an Athapascan language. The Apaches and Navajos are the American Bedouins. On their way from the far North they left several colonies in Washington, Oregon, and California. They came to the country on foot, but since the Spanish invasion

they have become skilled horsemen. They are wily warriors and implacable enemies, feared by all other tribes. They are hunters, warriors, and priests, these professions not yet being differentiated. The cliffs of the region have many caves, in which these people perform their religious rites. The Sierra Madre formerly supported abundant game, and the little Sonora deer was common. Bears and mountain lions were once found in great numbers, and they put the courage and prowess of the Apaches to a severe test. Huge rattlesnakes are common, and the rattlesnake god is one of the deities of the tribes.

In the valley of the Gila and on its tributaries from the northeast are the Pimas, Maricopas, and Papagos. They are skilled agriculturists, cultivating lands by irrigation. In the same region many ruined villages are found. The dwellings of these towns in the valley were built chiefly of grout, and the fragments of the ancient pueblos still remaining have stood through centuries of storm. Other pueblos near the cliffs on the northeast were built of stone. The people who occupied them cultivated the soil by irrigation, and their hydraulic works were on an extensive scale. They built canals scores of miles in length and built reservoirs to store water. They were skilled workers in pottery. From the fibers of some of the desert plants they made fabrics with which to clothe themselves, and they cultivated cotton. They were deft artists in picture-writings, which they etched on the rocks. Many interesting vestiges of their ancient art remain, testifying to their skill as savage artisans. It seems probable that the Pimas, Maricopas, and Papagos are the same people who built the pueblos and constructed the irrigation works; so their traditions

state. It is also handed down that the pueblos were destroyed in wars with the Apaches. In these groves of the flood plain of the Colorado the Mojave and Yuma Indians once had their homes. They caught fish from the river and snared a few rabbits in the desert, but lived mainly on mesquite beans, the hearts of yucca plants, and the fruits of the cactus. They also gathered a harvest from the river reeds. To some slight extent they cultivated the soil by rude irrigation and raised corn and squashes. They lived almost naked, for the climate is warm and dry. Sometimes a year passes without a drop of rain. Still farther to the north the Chemehuevas lived, partly along the river and partly in the mountains to the west, where a few springs are found. They belong to the great Shoshonean family. On the Rio Virgen and in the mountains round about, a confederacy of tribes speaking the Ute language and belonging to the Shoshonean family have their homes. These people built their sheltering homes of boughs and the bast of the juniper. In such shelters, they lived in winter, but in summer they erected extensive booths of poles and willows, sometimes large enough for the accommodation of a tribe of 100 or 200 persons. A wide gap in culture separates the Pimas, Maricopas, and Papagos from the Chemehuevas. The first were among the most advanced tribes found in the United States; the last were among the very lowest; they are the original "Digger" Indians, called so by all the other tribes, but the name has gradually spread beyond its original denotation to many tribes of Utah, Nevada, and California.

The low desert, with its desolate mountains, which has thus been described is plainly separated from the upper region of plateau by the Mogollon Escarpment,

which, beginning in the Sierra Madre of New Mexico, extends northwestward across the Colorado far into Utah, where it ends on the margin of the Great Basin. The rise by this escarpment varies from 3,000 to more than 4,000 feet. The step from the lowlands to the highlands which is here called the Mogollon Escarpment is not a simple line of cliffs, but is a complicated and irregular facade presented to the southwest. Its different portions have been named by the people living below as distinct mountains, as Shiwits Mountains, Mogollon Mountains, Pinal Mountains, Sierra Calitro, etc., but they all rise to the summit of the same great plateau region.

The upper region, extending to the headwaters of the Grand and Green Rivers, constitutes the great Plateau Province. These plateaus are drained by the Colorado River and its tributaries; the eastern and southern margin by the Rio Grande and its tributaries, and the western by streams that flow into the Great Basin and are lost in the Great Salt Lake and other bodies of water that have no drainage to the sea. The general surface of this upper region is from 5,000 to 8,000 feet above sea level, though the channels of the streams are cut much lower.

This high region, on the east, north, and west, is set with ranges of snow-clad mountains attaining an altitude above the sea varying from 8,000 to 14,000 feet. All winter long snow falls on its mountain-crested rim, filling the gorges, half burying the forests, and covering the crags and peaks with a mantle woven by the winds from the waves of the sea. When the summer sun comes this snow melts and tumbles down the mountain sides in millions of cascades. A million cascade brooks unite to form a thousand torrent creeks; a

thousand torrent creeks unite to form half a hundred rivers beset with cataracts; half a hundred roaring rivers unite to form the Colorado, which rolls, a mad, turbid stream, into the Gulf of California.

Consider the action of one of these streams. Its source is in the mountains, where the snows fall; its course, through the arid plains. Now, if at the river's flood storms were falling on the plains, its channel would be cut but little faster than the adjacent country would be washed, and the general level would thus be preserved; but under the conditions here mentioned, the river continually deepens its beds; so all the streams cut deeper and still deeper, until their banks are towering cliffs of solid rock. These deep, narrow gorges are called canyons.

For more than a thousand miles along its course the Colorado has cut for itself such a canyon; but at some few points where lateral streams join it the canyon is broken, and these narrow, transverse valleys divide it into a series of canyons.

The Virgen, Kanab, Paria, Escalante, Fremont, San Rafael, Price, and Uinta on the west, the Grand, White, Yampa, San Juan, and Colorado Chiquito on the east, have also cut for themselves such narrow winding gorges, or deep canyons. Every river entering these has cut another canyon; every lateral creek has cut a canyon; every brook runs in a canyon; every rill born of a shower and born again of a shower and living only during these showers has cut for itself a canyon; so that the whole upper portion of the basin of the Colorado is traversed by a labyrinth of these deep gorges.

Owing to a great variety of geological conditions, these canyons differ much in general aspect. The Rio Virgen, between Long Valley and the Mormon town of

Rockville, runs through Parunuweap Canyon, which is often not more than 20 or 30 feet in width and is from 600 to 1,500 feet deep. Away to the north the Yampa empties into the Green by a canyon that I essayed to cross in the fall of 1868, but was baffled from day to day, and the fourth day had nearly passed before I could find my way down to the river. But thirty miles above its mouth this canyon ends, and a narrow valley with a flood plain is found. Still farther up the stream the river comes down through another canyon, and beyond that a narrow valley is found, and its upper course is now through a canyon and now through a valley. All these canyons are alike changeable in their topographic characteristics.

The longest canyon through which the Colorado runs is that between the mouth of the Colorado Chiquito and the Grand Wash, a distance of 217½ miles. But this is separated from another above, 65½ miles in length, only by the narrow canyon valley of the Colorado Chiquito.

All the scenic features of this canyon land are on a giant scale, strange and weird. The streams run at depths almost inaccessible, lashing the rocks which beset their channels, rolling in rapids and plunging in falls, and making a wild music which but adds to the gloom of the solitude. The little valleys nestling along the streams are diversified by bordering willows, clumps of box elder, and small groves of cottonwood.

Low mesas, dry, treeless, stretch back from the brink of the canyon, often showing smooth surfaces of naked, solid rock. In some places the country rock is composed of marls, and here the surface is a bed of loose, disintegrated material through which one walks as in a bed of ashes. Often these marls are richly

colored and variegated. In other places the country rock is a loose sandstone, the disintegration of which has left broad stretches of drifting sand, white, golden, and vermilion. Where this sandstone is a conglomerate, a paving of pebbles has been left,—a mosaic of many colors, polished by the drifting sands and glistening in the sunlight.

After the canyons, the most remarkable features of the country are the long lines of cliffs. These are bold escarpments scores or hundreds of miles in length,—great geographic steps, often hundreds or thousands of feet in altitude, presenting steep faces of rock, often vertical. Having climbed one of these steps, you may descend by a gentle, sometimes imperceptible, slope to the foot of another. They thus present a series of terraces, the steps of which are well-defined escarpments of rock. The lateral extension of such a line of cliffs is usually very irregular; sharp salients are projected on the plains below, and deep recesses are cut into the terraces above. Intermittent streams coming down the cliffs have cut many canyons or canyon valleys, by which the traveler may pass from the plain below to the terrace above. By these gigantic stairways he may ascend to high plateaus, covered with forests of pine and fir.

The region is further diversified by short ranges of eruptive mountains. A vast system of fissures—huge cracks in the rocks to the depths below—extends across the country. From these crevices floods of lava have poured, covering mesas and table-lands with sheets of black basalt. The expiring energies of these volcanic agencies have piled up huge cinder cones that stand along the fissures, red, brown, and black, naked of vegetation, and conspicuous landmarks, set as they

are in contrast to the bright, variegated rocks of sedimentary origin.

These canyon gorges, obstructing cliffs, and desert wastes have prevented the traveler from penetrating the country, so that until the Colorado River Exploring Expedition was organized it was almost unknown. In the early history of the country Spanish adventurers penetrated the region and told marvelous stories of its wonders. It was also traversed by priests who sought to convert the Indian tribes to Christianity. In later days, since the region has been under the control of the United States, various government expeditions have penetrated the land. Yet enough had been seen in the earlier days to foment rumor, and many wonderful stories were told in the hunter's cabin and the prospector's camp—stories of parties entering the gorge in boats and being carried down with fearful velocity into whirlpools where all were overwhelmed in the abyss of waters, and stories of underground passages for the great river into which boats had passed never to be seen again. It was currently believed that the river was lost under the rocks for several hundred miles. There were other accounts of great falls whose roaring music could be heard on the distant mountain summits; and there were stories current of parties wandering on the brink of the canyon and vainly endeavoring to reach the waters below, and perishing with thirst at last in sight of the river which was roaring its mockery into their dying ears.

The Indians, too, have woven the mysteries of the canyons into the myths of their religion. Long ago there was a great and wise chief who mourned the death of his wife and would not be comforted, until Tavwoats, one of the Indian gods, came to him and told him his

wife 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 Tavwoats made a trail through the mountains that intervene between that beautiful land, the balmy region of 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 trail. Then he rolled a river into the gorge, a mad, raging stream, that should engulf any that might attempt to enter thereby.