COPY OF DIARY

of the

FOLGOM-COOK EXPEDITION

in 1869

TO THE YELLOWSTONE NATIONAL PARK
The head waters of the Yellowstone, although occasionally visited by small parties of prospectors and mountain men, and being within a few days ride of Virginia City, is still to the world of letters a terra incognita. Aside from any regular travelled route, no party of emigrants has ever passed through it on their way to the Pacific slope, and environed by mountain chains that are covered by dense growth of timber, that make all approach to it appear difficult, no expedition under the patronage of the government has yet attempted to penetrate its fastness. The hardy prospector searching for new diggings has hitherto failed to find gold in paying quantities but has always returned to tell of wonderful waterfalls one thousand feet high, of lakes in which were petrified forests, and of vast tracts of country covered with the scoria of volcanoes some of which were reported to be in active operation. Owing to the fact that this class of men had gained a reputation for indulging in flights of fancy when recounting their adventures, these reports were received with considerable incredulity, until it was noticed that however much the accounts of the different parties differed in details there was a marked coincidence in the description of some of the most prominent features of the country. In 1867 an exploring expedition from Virginia City was talked of. For some unknown reason, probably for the want of a sufficient number to engage, it came to naught. The next
year another was planned with like results.

Early in the summer of 1869 the newspapers throughout the territory announced that a party of citizens from Helena, Virginia City and Bozeman accompanied by some of the officers stationed at Fort Ellis with an escort of soldiers would leave Bozeman on or about the 5th of September for the Yellowstone with the intention of making a thorough examination of all the wonders with which that region was said to abound. Judging from what we could learn by conversing with some who expected to go the writer came to the conclusion that the party was to be limited in number and very select, composed of some of the most prominent men in the territory, and "A youth to fortune and to fame unknown" felt extremely flattered when his earnest request to have his name, with two personal friends, added to the list was granted. We procured an outfit and then waited with all the patience we could command for the others to perfect their arrangements. About a month before the day fixed for starting members one by one began to discover that pressing business engagements would prevent their going. Then came news from Fort Ellis that, owing to some change made in the disposition of troops stationed in the territory, the military portion would not be able to join the expedition which had now dwindled down to ten or twelve. Thinking it would be unsafe for so small a number to venture when there was a strong probability of meeting with hostile Indians, all abandoned the undertaking except the three friends before mention-
ed who were resolved to undertake the journey at all hazzards believing that the dangers to be encountered had been magnified and trusting by vigilence and good luck to escape them.

On the 6th of September we started from Diamond City, a mining town on a small tributary of the Missouri, forty miles east of Helena. From this point I copy from our diary.

September 6. Time: sunset; place: Crow Creek thirty miles from Diamond City. Scene: haystack in the foreground and five horses helping themselves to their supper, a campfire in the rear with all the paraphanalia of a camp outfit, and three unpretentious looking individuals scattered around promiscously. The long talked of expedition is off at last but shorn of the prestige attached to the names of a score of the brightest luminaries in the social firmament of Montana as it was first announced. It has assumed proportions of utter insignificance and of no importance to any one in the world except the three actors themselves. Our leave-taking from friends who had assembled to see us off this morning was impressive in the highest degree and rather cheering withal. "Good-by boys, look out for your hair": "If you get back at all it will be on foot": "Don't let the Indians snatch you bald headed": "If you do get into a scrape remember I warned you": "It is the next thing to suicide" etc., etc. was the parting salutation that greeted our ears as we put spurs to our horses and left friends and home behind.

September 7. Resumed our journey at 6 o'clock and arrived at
eight o'clock and arrived at the forks of the Missouri at one P. M. Here in '63, a party of pioneers solicitous for the future welfare of the public in general and with an eye to their own prosperity in particular, located a town site which was to be the metropolis of the embryo state they were hoping to plant on the eastern slope of the Rocky Mountains. It was to be to Montana what Denver is to Colorado. A line of steam boats built expressly for the purpose would ply between this place and the falls of the Missouri where they would connect with the lower river boats. Corner lots were at a premium and anyone who was fortunate enough to own one had a fortune in prospect. Today in lieu of a steamboat perfect in all its appointments a water logged ferryboat conveyed our effects across the river for which we were charged the modest sum of two dollars U. S. currency. It required a stretch of the imagination to convert Wilson's flour-mill into that imposing structure, the capitol which we had seen on paper years ago. Instead of a commercial mart teeming with life and enterprise we found two shebangs which fulfilled all the requirements of the people by dispensing bacon, sugar, and coffee in limited quantities and forty-rod whiskey in unlimited quantities to the inhabitants of Gallatin City and vicinity. From Gallatin City a ride of nearly three hours brought us near Hamilton where we are camped for the night.

September 8. From Hamilton to Bozeman, a distance of 18 miles, our road passed numerous ranches whose plethoraic stacks of grain or
wide fields thickly studded with golden shocks gave ample evidence of
the propriety of calling this valley the Genesee of Montana. Twenty-
five bushels of spring wheat to the acre is a low estimate for the av-
erage yield, while as high as sixty or seventy bushels have been har-
vested. The present crop is unusually fine and there is probably
wheat enough in Gallatin County alone to supply the territory with
bread stuff for one year. If fine crops, large herds of cattle, and
broad acres enclosed with substantial fences is any criterion of pros-
perity and thrift, surely some of the farmers of Gallatin valley have
no cause for complaint. I say some of the farmers, for in contrast
with well kept ranches, neat houses and spacious corrals for the ac-
commodation of cattle, we occasionally saw a ranch where the fences
were either down or on their last legs, where a few scrawny cows rum-
inated before the door of a rough log cabin, and where the meager
stacks of grain and a pack of half starved dogs betoken the abode of
that lazy, shiftless specimen of humanity ycleped "The Piker", a class
of men to whom Theodore Winthrop in John Brent paid so just a tribute.
Bozeman a thriving pioneer town is beautifully located in the
eastern part of the valley. We found it had been recently visited by
a party in the interest of the N. P. R. R. for the purpose of making
a preliminary survey of the Bozeman pass, the lowest pass in the div-
ide between the waters of the Yellowstone and the Missouri, and who
having decided upon the feasibility of the route had made everybody
jubilant over the belief that the road would be built at no distant
day and that a brilliant future awaited all that owned town lots in that burg.

September 9. This being the last place where supplies can be obtained we spent the forenoon in making such additions to our caisson as we deemed necessary for a six weeks trip and our outfit when completed consisted of 175 pounds of flour, 25 pounds of bacon, one ham, 30 pounds of sugar, 15 pounds of ground coffee, 10 pounds of salt, 10 pounds of dried fruit, one dozen boxes of yeast powders, 50 pounds of potatoes, one small camp kettle, one coffee pot, two frying pans, three tin cups, three knives, forks and spoons, ammunition, five pairs of blankets, two buffalo robes, a pick-pan and shovel and an ax and when first collected together looked like a formidable load for two pack horses, but Billy who had served an apprenticeship in a pack train in Webfoot country and was expert in all the mysteries of the art, took charge and soon arranged them in convenient packages of smaller compass than I could have believed possible. We have a double-barreled shot gun for killing small game which will be carried in one of the packs in such a way that it can be drawn out in a moment without loosening the lash rope. Each of us carry a repeating rifle, a Colt's six shooter, a bayonet, and a sheath knife. We can shoot fifty rounds without reloading and believe in a fair field we are more than a match for any band of hostile indians that there is any likelihood of meeting. C who has been duly elected captain to serve during good behavior carries a field glass as a badge of his office.
D having in former days been a sailor is supercargos and general factotum and carries twine and cord for measuring and sounding. D who had carried a surveyor's chain for two days and is supposed to have a practical knowledge of topography is to take charge of that department and carry a small pocket compass and thermometer. Having completed all our arrangements we made a final adieu to civilization, and believing it necessary that we should adopt some system in traveling it was decided that C should lead the van and E and D drive the pack animals and act as rear guard and were strictly enjoined to use every precaution possible to guard against surprises from that quarter. We are to observe this order while traveling. Two and one-half miles from Bozeman we passed Fort Ellis and we think whoever located the post displayed strategic talent of a high order, as they can be protected by the settlements besides it is very convenient for the soldier to exchange his greenbacks for whiskey and all the other little luxuries so necessary to their happiness. We camped only four miles from the Fort at the foot of the range. Predatory parties of hostile Indians are frequently seen in this vicinity and we consider we are in more danger here than we shall be when we get farther away from the settlements. We selected our camp ground on a piece of high ground, away from underbrush to avoid surprise. Will let the horses feed until dark, then picket them close to our beds, put out the fire and turn in. The dog will give the alarm if anything approaches. We have no tent as we did not consider it safe to
use one in an Indian country.

September 10. We were aroused at daybreak by a moose which was probably on her way to the creek for her morning dram. He was standing three or four hundred yards away expressing his astonishment at our appearance by making a noise that sounded like a cross between the squeal of a pig and the bark of a wolf. Perhaps it is needless to say that the surprise was not all on his side. The dog gave an answering bay and made an unsuccessful attempt to cultivate a closer acquaintance with his lordship but his awkward shambling trot soon carried him out of sight. We got an early start and followed up the creek which is a tributary of the East Gallatin and in a short time found ourselves traversing a deep ravine; on the left a perpendicular wall of limestone arose a thousand feet or more while on the right the mountain rose in steps or terraces irregular in height and distances apart with the intervening spaces covered with the dense growth of spruce. In some places the mass of dark green foliage was unbroken from base to summit. At others it was relieved by butting cliffs of fantastic shape so characteristic of the limestone formation. On one of the highest points stands a huge rock that bears a strong resemblance to an old castle; rampart and bulwark are slowly yielding to the ravages of time but the stout old turret stands out in bold relief against the sky with every embrasure as perfect in outline as though but yesterday it had been laid up by the hand of man. We could almost imagine it was the stronghold of some baron of Feudal
times and we were his retainers returning laden with the spoils of a successful foray. As we approach the summit the timber appears only in patches and the hills on either side are less abrupt and covered with a luxuriant growth of bunch grass which affords fine pasturage for the numerous herds of antelope we saw. Immediately after crossing the divide we struck the head of Trail Creek and followed it down six or seven miles in an easterly direction to where it debouched from the foothills into the valley of the Yellowstone. Here we turned in a southerly direction over a low rolling plateau covered with prickly pear through which our horses gingerly picked their way, and arrived at the river about sunset. This valley is about twenty-five miles long and from one to five miles wide. At the foot of it the mountains close in on both sides forming a canyon below which is the Yellowstone proper. In 1864 Bridger piloted a party of emigrants to a small stream which rises in the mountains on the east side and empties into the river opposite our camp. This has since been known as Emigrant Gulch. It prospects well but it is deep and the bedrock has never been reached in a practical manner, and more than one poor "pilgrim" vision of a fortune has vanished in thin air before the stern realities of its boulders and quicksands. A small party is still delving away and proving its faith by its works. The mountains on that side are very precipitous and "Old Emigrant", a sugar loafed peak, is the highest in the range. The distance travelled today was thirty-five miles.
September 11. We started this morning with the intention of crossing the river and taking a look at the mines but missed the trail that led to the ford, and after travelling about five miles came to a ranch to enquire the way but found no one at home. A casual survey of the premises convinced us that whoever had taken up his abode here belonged to a class frequently found upon our frontiers that take life easy. A cabin without any chinking between the logs with a roof through which every passing shower would filter for hours after it had ceased raining satisfied his wants for a domicile. A small stack of wheat to which a dozen head of cattle had free access had recently been harvested from an unfenced field of about forty acres will supply him with the staff of life provided it will not all be destroyed before he gets time to thresh it. A pile of antelope and elk skins proved he depended upon the rifle for meat. After a short consultation we decided to remain on the west side of the river and as it was threatening to rain we resumed our journey and before we reached a timbered creek three miles above, were thoroughly wet. Having no tent we improvised one by stretching a rope between two trees over which we threw a blanket pinning the corners to the ground, under which we stowed all our effects, ourselves along with them, and tried to make each other believe that we were very comfortable but if blue noses and chattering teeth are any proof to the contrary we were not so very comfortable after all. Towards evening it stopped raining and before the genial glow of a roasting fire we soon dried our clothes and soon forgot how
unpleasant is the cold drizzle of an autumn storm. Among other things the Yellowstone is famed for its trout. After the temperature of our bodies had risen to enjoyable heat D started out to try his luck and in a few minutes returned with four splendid fellows whose aggregate weight could not have been less than 10 pounds and before they were hardly done flopping we had two of them in the frying pan cooking for supper.

September 12. We had frequent showers during the night but it cleared up a little after sunrise and by eight o'clock we were in the saddle. The valley gradually narrowed in as we advanced and canyoned twelve miles above our last camp. At the upper end of the valley the river receives a small tributary from the west, and upon arriving there we discovered three ponies grazing on the creek bottom and a smoke rising from the willows that skirt its banks. Here we found a wickiup inhabited by two old squaws who were engaged in gathering and drying choke-cherries. They were seated on the ground with a smooth, flat stone between them upon which one would place the cherries while the other would crush them with a round boulder. They had several bushels drying in the sun spread out on old rags and bits of hide. Everything around them indicated the most abject poverty. Their wickiup was formed of a few poles placed in a circle of not more than eight feet in diameter with their tops interlaced in the usual manner. These were thatched with grass two or three feet from the ground but were open at the top. They had no bedding except the rags upon which the cherries
were spread. Not a single utensil for cooking was anywhere to be seen and so far as we could learn the cherries were their only means of subsistence. We rode up and saluted them with the customary "How" to which they returned no answer and manifested no surprise at our presence but after a long stare resumed their occupation. As we turned to leave the oldest came out and commenced talking in a gibberish that was unintelligible to us. She seemed desirous to communicate some intelligence for she repeated the same words several times, pointing up the river and counted thirty by opening and closing both hands three times. The only word we could understand was "tonkey" which in the Sannock language means mountain sheep and is the name of a band of this tribe called by the whites "Sheep Eaters". Anything in human shape more squalid than this child of nature it would be impossible to conceive. Her gray hair hung from her low narrow forehead in elf-lock over her bleared eyes. The rhume from their caverns and the drule from her toothless mouth ran down the gullies of her withered cheeks and fallen jaws; her skinny arms were begrimed with dirt; her claw-shaped hands were stained with the juice of cherries; and the rags reeking with filth which served her for clothing revealed rather than concealed the hideousness of her form. We turned away with loathing and disgust and not wishing to stop anywhere in their vicinity passed up through the canyon. Here we found some very rough travelling and while climbing over the rocks started a herd of antelope and finding themselves hemmed between us and the mountains they at-
tempted to escape by dashing past us. B and D fires two shots each from their rifles without effect but they ran so close to the captain that he knocked one down with the shot gun loaded with a light charge of fine shot. We camped close to the river on a narrow bottom and fared sumptuously on antelope steak and trout fresh from the river.

September 13. We have travelled about twenty miles today and in following the general course of the river for the first fourteen miles we bore south, 25 degrees east, thence due east two miles and crossed a creek of considerable size coming from the south. A mile further up we came to a canyon where the mountains were so precipitous we were obliged to leave the river bank and after an hours hard climbing reached the summit of a high plateau and soon after camped on a small stream with wood convenient and fine grass in abundance. During the early part of the day we were frequently obliged to make a short detour through the foothills to avoid deep ravines or places where the hills terminated abruptly at the waters edge. The river has no valley here. It hugs the base of the mountains on the east side, leaving low hills or a narrow bench between it and the foot of the range on the west. Our road today has been a rough one and we are beginning to experience a little of the romance of travelling over an unfrequented country where the ever changing panorama of mountain scenery is different from anything we have ever seen before. The general features of the country present many features of
of interest to the geologist. At one place we noticed a slate formation having a vertical dip in which the strata varied in hardness. It passed through a hill which in wearing away had left two smooth, unbroken walls, twenty feet thick and from twenty to eighty feet in height. They are about sixty feet apart and are parallel to each other as straight as a line from the bottom to the top of the hill. The space between them presents the appearance of a well travelled road. This is a hunter's paradise. We saw the tracks of elk, deer, and sheep in great abundance and for several miles were scarcely out of sight of an antelope, but as we have fresh meat enough to supply our present needs we did not attempt to shoot any.

September 14. Soon after starting this morning we crossed a low ridge and as we were descending it discovered an Indian two miles away driving a band of some twenty or twenty-five head of horses towards a clump of willows from which the smoke was rising. It was evident he had seen us and was hurrying to camp to give notice of our approach. We halted on the spot and called a council of war for we were not expecting to meet any Indians here and thought it might possibly be a war party. Knowing it would be impossible to avoid them we decided to make preparations to give them a warm reception in case they made any hostile demonstrations, so we overhauled our packs, tightened the cinches of our saddles, recapped our revolvers, filled our belts with cartridges for our rifles, and putting on a bold front started forward, changing our course slightly to the
left to shun them if possible. In a few minutes two of them came dashing over the prairie and on coming up proved themselves to be Tonkeys or Sheepeaters and consequently friendly. This relieved our minds of some apprehensions and we interchanged the compliments of the season and made such inquiries as their limited stock of English and our knowledge of pantomime would permit. They informed us that there was a party of thirty lodges of Sheepeaters eight days ahead; so that was what the old squaw was trying to tell us day before yesterday. We did not visit their camp but one of them accompanied us four or five miles begging for ammunition and matches. For several hours we traveled on a high rolling table land diversified by smiling lakes, picturesque rocks, and beautiful groves of timber. Two or three miles to our left we could see the deep gorge through the mountains which the river had cut flowing westward. As we descended from the plateau we struck a trail which had recently been traveled by a large party of indians and we followed it until it led us to the river at the head of the canyon; here we camped for the night. The river has resumed its northern course again and from the hills to day we could trace the deep channel through which it flows for many miles to the south between two parallel ranges of mountains that seem to be covered with dense timber. From all appearances we believe it is one continuous canyon, from this place to the falls which must be a distance of twenty-five or thirty miles, through which no one has ever passed. We have decided to cross here and follow up the east branch which is an open valley, one days travel, then
in a southwesterly course and try to strike the river again near the falls.

September 15. Just below our present camping place is a canyon three miles long and while passing around it yesterday we caught glimpses of scenery surpassing in grandeur anything we have before seen, so we concluded to lay over one day and give it a more thorough examination than our limited time last evening would permit. We had breakfasted by daylight and thinking it would be unsafe to leave our horses unguarded, it fell to D's lot to remain in camp with the understanding that C and I should return early and give him an opportunity to visit. We climbed the bluff keeping away from the edge of the precipice until we had traveled about half the distance down the bank of the canyon to where a timbered point offered a secure and favorable place to view the grand scenery which opened before us. We were standing upon the verge of an overhanging cliff at least six-hundred feet high. The opposite bluff was nearly on a level with the place where we were standing and maintained its height for a mile up the river but gradually sloped away toward the foot of the canyon. The upper half presented an unbroken face with here and there an reentrant angle but everywhere maintained its perpendicularity. The lower half of the face was covered with the debris which had fallen from the wall and formed a rubble against the encroachments of the river, but the most singular feature was the formation of the wall. At the top there was a structure of brown basalt from thirty to forty feet thick standing in hexagonal
columns; beneath that a bed of conglomerate eighty feet thick composed of washed gravel and boulders; then another stratum of columnar basalt of about half the thickness of the first and lastly what appeared to be a bed of coarse sandstone. A short distance above us, rising from the bed of the river, stood a column of conglomerate rock nearly round which we estimated at forty feet in diameter at the base and three hundred feet high, tapering gradually to about three feet at the top. It was so slender it seemed as if one man could topple it over. How it was formed I leave others to conjecture. We could see the river for nearly the whole distance through the canyon, now dashing over some miniature cataract, now fretting against huge boulders that seemed to have been hurled by some giant hand to stay its progress, and anon circling in quiet eddies beneath the dark shadows of some projecting rock. The water is so transparent we could see the bottom from where we were standing even when it was several feet in depth and has that peculiar emerald tinge so characteristic of our Montana streams. On the left bank the wall is broken down in many places and cut by transverse ravines running back into the hills. The bluffs on this side are covered by a heavy growth of timber which extends down the slope to the river wherever there is soil enough for a tree to take root. A half mile down the river and near the foot of the bluff was a chalky looking bank from which steam and smoke was rising and on repairing to the spot we found a vast number of hot sulphur springs all of which were small however. The steam was issuing from every crevice and hole in the
rocks mingled with vile gases which at times were very offensive. All these crevices were lined with beautiful crystals of sulphur as delicate as frost work and as bright as burnished gold. At some former period not far distant there has been a volcanic eruption here. Much of the scoria and ashes which have been thrown out have been carried off by the river but enough still remains to form a bar. Seventy-five or one hundred feet in depth, smoke is still issuing from the rock in one place from which a considerable amount of lava has been discharged within a few days or weeks at furtherest. While we were standing by, several gallons of a black looking liquid ran down and hardened upon the rocks. We broke some of this off and brought it away, which proved to be sulphur, pure enough to burn readily when ignited. In passing over these places we carefully picked our way, fearing lest the ground should give way beneath our feet and let us through.

(Extract from Folsom). "The Gap with the most reckless abandon, had to sniff the vapors from every crevice and test the temperature of every spring. He barely missed paying for his rashness; for while descending a steep embankment from which the steam was rising in a hundred jets, one foot broke through the crusts formed by the crystallization of sulphur across the top of the crevice fifteen inches wide and several feet in depth. A headlong stumble which ended in a roll in a bed of ashes saved him, for on lowering the thermometer into the hole by a string the mercury instantly rose to 104 degrees and he concluded that a fall into that hole would have "cooked his goose". He took it very
cooly, however, considering the temperature and went on collecting specimens for his cabinet as though nothing had happened and soon had enough to load a mule consisting of sulphur, carbonate of lime, pumice stone, basalt, and cinders. These he very considerately consigned to my keeping, but as I have always had an aversion to carrying more than I can lift, the most of them are lying there yet.⁡ The deepening shadows admonished us that the afternoon was waning, and as we had another place of interest to visit, we reluctantly left the springs, climbed the steep bluff again, and returned to the head of the canyon. Here a stream of considerable size, that arises in the mountains away to the west, goes dashing along the bed of a deep ravine over a succession of cascades which increase in height and beauty and culminate in a perpendicular fall of one hundred thirty-eight feet, thence flowing between vertical walls which taper off toward the river. It finally steals out in a gently flowing current and quietly unites its waters with the Yellowstone. From this point we followed up the ravine to the foot of the falls. Here we found an amphitheater oblong in shape and three hundred feet in length by two hundred in width nearly enclosed by a perpendicular granite wall between two hundred and three hundred feet high. The rock has a coarse, rotten texture and the work of disintegration is rapidly going on; consequently there are no sharp angles or deep fissures. The sides around the falls were covered with lichens, which being constantly wet with spray, gave the wall the appearance of being painted green of the deepest hue. About half way up the steam seemed
to burst out of the side of the wall and fall in a body of spray into
a deep pool; but night was approaching so we retraced our steps down
the ravine and back to camp where we arrived a little after dark, hun-
gry and tired.

September 16. We broke camp at seven o'clock, forded the river and
climbed the opposite bluff still following the Indian trail. Our course
was easterly around the base of the mountains until we struck the east
fork nine miles above its junction with the main branch. Here the
mountains recede leaving a beautiful valley seven miles long from north
to south. We traversed its entire length and at the upper end entered
a forest of heavy timber into which we penetrated four miles and camped
in an open glade. Here for the first time since starting we experienced
a feeling of loneliness. Our field of vision is circumscribed to the
narrow limits of a few acres bounded by a dense forest of spruce and
pine from the somber depths of which no sound arises save the monoto-
 nous sighing of the wind through its branches. As darkness approaches,
the voice of the night breaks in upon the pervading stillness. The wolf
scents us afar and the mournful cadence of his howl adds to our sense
of solitude. The roar of the mountain lion awakens the sleeping echoes
of the adjacent cliffs and we hear the elk whistling in every direction.
But perhaps these are unusual sounds and are raised in protest against
the approach of the common enemy. Even the horses seem filled with a
feeling of dread, stop grazing and raise their heads to listen and then
hover around our campfire as if their safety lay in our companionship.
We pile up the logs and build a fire that shall last all night and then seek "Freed nature's sweet restorer, balmy sleep".

September 17. It rained a little during the night and in the morning the sky was overcast and had every appearance of an approaching storm, but as the grass was very poor we deemed it necessary to move camp. Six miles hard travelling over steep ridges and intervening ravines brought us near the summit of the divide between the forks of the river where we found all the requisites for a camping place, viz., wood, water, and grass, and as the storm was about to set in we took shelter behind some spruce trees, pitched our blanket tent and protected it by thick boughs on the windward side. It commenced snowing about twelve but it melted as fast as it fell. The storm continued during the afternoon but we were well prepared for it and got along nicely. The poor horses suffered though and we were obliged to picket them to prevent their running away. We saw a great many deer today and judging from the tracks, elk are also very abundant.

September 18. We have lain in camp all day. The storm still continues; ice formed 1/4 of an inch thick during the night; and there is six inches of snow on the ground. The situation begins to look disagreeable.

September 19. It was cold and clear this morning but the sun shone bright with the promise of warm weather again in a few days. Upon reaching the summit we got an extended view of the surrounding country. To the eastward at our feet lay the little valley of the east fork be-
low the line of snow and apparently in another climate. The serrated
peaks of the Big Horn range beyond glistened like burnished silver in
the sunlight, and overtowering them, in the dim distance, the Windriver
mountains seemed to blend with the few fleecy clouds that skirted their
tops. Turning in the opposite direction, as far as we could see from
the northwest around to the southeast, mountain and valley was covered
with timber. In contrast with the barren, snowcapped peaks behind us
the dark green foliage deepened in hue as it receded, till it terminated
at the horizon in a boundless black forest. In several places a
few miles to the southward we could see dense clouds of steam rising
above the tree tops indicating the location of tremendous hot springs.
We took the bearing of the place where we supposed the falls to be and
shaped our course so as to visit some of the larger springs, and eagerly
started forward down the western slope and entered the forest. We
soon found travelling very difficult for, in addition to rough ground,
we had to pick our way through fallen timber tangled and interlaced
with underbrush and were sometimes an hour in travelling a mile. It
got better towards noon and then we made tolerably good progress. A-
bout the middle of the afternoon we came to a small stream of clear
water running in a northwesterly direction. Our horses appeared to
be thirsty but we noticed that one taste of the water seemed to satisfy
them. The mystery was soon explained for upon trying it ourselves
we found it had an astringent sub-acid taste like a mixture of alum,
vinegar, and water. Two miles further on we found good water and camped.
We have had a hard day's travel and only made eight miles.

September 20. An hour after starting we came to a gentle declivity at the head of a shallow ravine from which the steam rose in a hundred columns and united in a cloud so dense as to obscure the sun. In some places it spurted from the rocks in jets not larger than a pipe stem and in others it curled gracefully up from the surface of boiling pools from five to fifteen feet in diameter. In some springs the water was clear and transparent; others contained so much sulphur that they looked like pots of boiling yellow paint and one of the largest was as black as ink. Near this was a fissure in the rocks several rods long and two feet across in the widest place at the surface but enlarged as it descended. We could not look down to any great depth on account of the steam but the ground echoed beneath our tread with a hollow sound and we could hear the waters surging below, sending up a dull, resonant roar like the break of the ocean surf into a cave. At these springs but little water was discharged at the surface; it seemed to pass off by some subterranean passage. A half mile down the ravine it broke out again. Here the springs were in groups spreading out over several acres of ground. One of these groups, a collection of mud springs of various color situated one above the other on the left slope of the ravine, we christened "The Chemical Works". The mud as it was discharged from the lower side gave each spring the form of a basin or pool. At the bottom of the slope was a vat ten by thirty feet where all the ingredients from the springs above were united and simmered down to a nasty greenish-
yellow compound of the consistency of hasty pudding. Three miles further on we found more hot springs along the sides of a deep ravine at the bottom of which flowed a creek twenty feet wide. Near the bank of the creek, through an aperture four inches in diameter, column of steam rushed with a deafening roar and with such force that it maintained its size for forty feet in the air; then spread out and rolled away in a great cloud toward the heavens. We camped near by and spent the afternoon in examining the springs and many other wonders about the place. We found inexhaustible beds of sulphur and saltpeter. Alum is also abundant. A small pond in the vicinity some three hundred yards long and half as wide contained as much alum as it could hold in solution. The mud along the shore was white with it, crystallized by evaporation. Our supply of fresh meat was getting low so towards evening I went hunting and succeeded in killing a fine elk within a mile of camp.

September 21. A pleasant ride of eighteen miles over an undulating country covered with a small growth of scattering pine with no underbrush or fallen timber, brought us to the great canyon two miles below the falls. We got a distant view of them but there being no grass convenient we passed on up the river a half mile above the upper falls and camped on a narrow flat close to the river bank.

September 22. We spent the day at the falls, a day that has been a succession of surprises and we return to camp realizing as we never have before how utterly insignificant are man's mightiest efforts when
of the distance downwards the sides are perpendicular, from thence running down to the river in steep ridges that are crowned by rocks that are of the most grotesque form and color, and it required no stretch of the imagination to picture fortresses, castles, watchtowers, and other ancient structures of every conceivable shape. In several places towards the bottom steam issued from the rocks, and judging from the indications, there were at some former period hot springs or steam jets of immense size all along the wall. We have seen many phases of mountain scenery but nothing that could compare with this for variety. It is pretty, beautiful, picturesque, magnificent, grand, sublime, awful, and terrible.

September 23. We broke camp at seven o'clock intending to make a good day's drive but we found so many attractions along the way that night overtook us only twelve miles from the falls. From this place to a point one mile above the falls the river bears north forty-five degrees and from the falls to the forks, a distance of twenty-five miles, its general course is north, forty-five degrees east. Unlike the dashing mountain stream we have followed so far, it is here wide and deep, flowing with a gentle current along the foot of the low hills or meandering in graceful curves through grassy meadows. The country is also changed in appearance. Instead of ragged mountains and deep defiles we have gently rolling hills and shallow water courses. This is the northern slope of a high plateau between the waters of the Yellowstone and Snake rivers. It is covered with timber except along the margin of some of the streams. We saw myriads of ducks and geese and the Cap dis-
played his skill with his Winchester rifle by taking a long shot at a flock of geese standing on a sandbar on the opposite side of the river and knocked over two in quick succession. Six miles from camp we found a ford and crossed over to the left bank to visit some hot springs in the hills a mile from the river. These were larger than any we have seen before but were of the same general character. Near our present camp we came to another collection that deserve more than a passing notice. These like the most we have seen are situated upon a side hill and as we approached them we could see the steam rising in puffs at regular intervals of fifteen or twenty seconds accompanied by a dull explosion sounding like the discharge of a blast underground. These explosions came from a large cave that ran back under the hill from which mud had been discharged in such quantities as to form a heavy embankment twenty feet higher than the floor of the cave and which prevented the mud from flowing off but the escaping steam had kept a hole open up through the embankment of mud in front of the entrance twenty feet in diameter. The cave seemed nearly filled with mud and the steam puffs came with such force and volume that it would lift the whole mass against the roof and dash it out into the open space in front, and then as the cloud would lift we could see it settling back in turbid waves into the cavern again. Our camp is half a mile away from it and yet we can distinctly hear every explosion and almost imagine we can feel the ground tremble beneath our feet as it does at each pulsation in the immediate vicinity. Three hundred yards to the west of the mud cave is another
that discharges pure water. The entrance is in the form of a perfect arch, seven feet in height by five in width and maintains this size as far back as we could see. The floor being covered with hot water to the depth of several inches prevented our exploring it. A short distance below these caves were several large sulphur springs. The most remarkable of these was a shallow pool seventy-five feet in diameter in which clear water on one side and yellow mud on the other was gently boiling without mingling.

September 24. Eight miles brought us to the Yellowstone lake. The main body is ten miles long from east to west and sixteen miles long from north to south, but at the south end it puts out two arms, one to the southeast and the other to the southwest, making the entire length about thirty miles. Its shores whether gently sloping mountains, bold promontories, low necks of land, or level prairies are everywhere covered with timber. There are three small islands which are also heavily timbered. The outlet is at the northwest extremity. We followed along the north shore five miles and camped on a patch of open prairie at the termination of the north arm. Three miles to the east of us, at the foot of a rocky bluff, we can see steam rising from a great number of hot springs, some of them apparently at the waters edge. The shallow water in some of the coves affords feeding ground for thousands of water fowl and we can take our choice of ducks, geese, trout, pelican, or swan. Our supply of provisions is getting low which warns us that we must soon turn our steps towards home and we have concluded to follow
up the west shore to the head of the lake and then turn to the northwest, cross the range and try to find the Madison and follow it down to civilization.