

would not pay by any other method of handling.

The Snake river drainage has cut many canyons through this wash, the eroded matter having been carried down and deposited along that stream. This is doubtless the origin of the flour gold found on the lower Snake, which has afforded remunerative mining ground for a number of years. This great auriferous debris at the head of the river lies on lime and sandstone rocks. The deposition was made evidently prior to the upheaval of the main divide, as it caps the summit at Union Pass and extends down Wind river quite a distance. But it does not contain gold in such large proportions as the gravels of the Pacific slope. I would not advise miners to go to that country unless they possess sufficient capital to open and operate hydraulic grounds. In the Teton range the crystalline gold-bearing rocks abound, and some auriferous ores were here found *in situ*. Owing to the lateness of the season and the inclement weather, thorough exploration of that district could not be made, but I intend to return to it and determine its value for mining purposes. The Teton is one of the most wild and rugged ranges on this continent. Mt. Hayden and Mt. Moran are the highest elevations there, the former being the keystone of the range. This Alpine peak culminates at an altitude of nearly 13,900 feet, and is visible from nearly all parts of the National park.

BAROMETRICAL OBSERVATIONS.

The following altitudes were noted in these several mountain ranges, with observations on vegetation, etc., between latitude 42° and 46° north: The main elevation only is given; the difference in the extremes between the north and south slopes of the mountains exceeding often 1,000 feet. Incipient evergreens, 6,000 feet above the ocean; limits of foliaceous trees, 9,500 feet; gramineous vegetation, 10,000 feet (which is also the limit of evergreen trees); foliaceous shrubbery, 11,000 feet; of evergreen shrubbery, 11,500 feet; limits of alpine flowers and herbaceous vegetation, 12,000 feet; perpetual frozen lakes and incipient glaciers, 13,000 feet; pseudo-meteoric dust or red snow (*pal-mella rosea* of the English writers) is visible at an altitude of 13,000 feet; glaciers of vast extent exist between 13,000 and 14,000 feet above the ocean, especially in the Wind River mountains. Close attention was given to timber line in this country, and wherever noticed I found trunks of dead trees above those of the living; unmistakable evidence of increasing cold. Another notable feature near timber line on the north slopes of the Wind River range, was that the trees, instead of standing vertically, are found leaning to the southeast, being occasioned by the terrible winds that blow here from the northwest.

ZOOLOGY.

The fauna of this country does not differ materially from that of other parts of the Rocky mountains. Buffalo are found in large herds through the Big Horn mountains, but they are being rapidly exterminated by the Indians. Elk and mountain sheep are very plentiful through all the ranges of the Yellowstone country, being generally found near the snow in the summer, where the grass is new and tender. The mountain goat (*Aplocems montanus*) was not observed in any of the ranges, but has been reported by Indians to exist in the mountains farther north. Only two specimens of the moose were seen. Deer are very plentiful, antelope being generally found around the foothills and on the plains in large herds, also in the National park. No gazelle were found here, but in the Black Hills before populated I shot several of this species of deer, they being numerous on the Belle Fourche river. Bear are very abundant in this region. In the Big Horn range I have seen as many as 20 in one day. They are of four kinds, generally known as the Rocky Mountain grizzly, cinnamon, black and silver tip. Mr. H. R. Wormwood and myself on ascending a peak in the Sierra Shoshone range last July, saw 10 bear at one sight, two

of them which we shot. They were feeding on the ubiquitous grasshopper. The snow in these high altitudes is sometimes black with these insects, which get so thoroughly chilled after alighting, that they are unable to fly away. The plaintive bleat of the little coney (*Lagomys princeps*) was heard on all sides, above an altitude of 10,000 feet, and so far as I could ascertain, this rabbit lives at a greater elevation during the winter than any other animal. It was found in the all local ranges near the limits of vegetation. The mountain lion, wolf, coyote, lynx and a great variety of the minor carnivorous genera inhabit this region. The chief fur-bearing animals indigenous here are the black and silver gray fox, otter and beaver. Baird's rabbit (*Lepus Bairdi*) is met with in the Big Horn, Shoshone and Snowy mountains. This interesting species was seen in the dense forests of the evergreen zone, about 8,000 or 9,000 feet high. The little chipmunk, as usual, was often around camp inspecting our provisions. The little water ouzel we noticed along all the mountain streams, this little bird appearing to have a fondness for rushing torrents, cascades and deep canyons, its twittering songs mingling harmoniously with the musical but thundering falls of water. Allan's finches (*Leucosticte australis*) were noticed in the Big Horn mountains, near the limits of vegetation. The dusky grouse (*Tetrao obscurus*) is common, although not as numerous as Richardson's grouse. A great variety of aquatic fowls is noticeable in the lake regions of the Yellowstone and Snake rivers, the swan, pelican, gull, crane, loon, goose and many kinds of ducks abounding here, where they remain during incubation in the summer months. The American eagle is very numerous around the Yellowstone lake, also its co-tenant the fish hawk. The Alpine insect fauna of these mountains is similar to that found in the ranges of Colorado; but owing to the paucity of vegetation insects do not thrive here at as great an altitude as they do further south, where lichens and flowers are more abundant. Very little insect life could be found here above timber line. On the the highest peaks no organic life of any description was visible. I really suppose the pole itself presents hardly a more barren and frigid scene of desolation than these glacial peaks. Along the east base of the Big Horn range, we meet with a fine agricultural country, having an average altitude of 6,000 feet. The climate is very healthful, and the country blessed with a cool and bracing atmosphere. The upper tributaries of the Big Horn, Yellowstone, Snake and Green rivers, are unfit for agricultural purposes, owing to their altitude and roughness. Some spots are, however, fit for grazing and stock rearing.

THE NATIONAL PARK.

As most of your readers are probably somewhat acquainted with the topography of this spot, I will confine my description thereof to merely a synopsis. This great wonderland lays between the Sierra Shoshone and the Rocky mountains, between latitude 44° and 45° north, its mean altitude being about 8,000 feet above the ocean. It has an area of 2,500 square miles, covering for the most part a very abrupt and broken country, abounding everywhere with impressive views of mountain scenery. The interior, however is very beautiful, being diversified with rolling hills, dense forests of leathery top pines, open glades and park-like views, with now and then a miniature savanna of silvery lakes and rushing streams. The atmosphere is salubrious and transparent, imparting to the far off peaks a sharp outline and the appearance of close proximity. The greatest collection of natural curiosities of the world has been gathered by nature herself in this National park, lying in Montana and Wyoming Territories.

The Yellowstone lake, a handsome sheet of water, is situated in the southeast corner of the park, at an elevation of 7,788 feet above sea level. Along its southern and eastern shores the mountains present an impressive scene of rugged beauty, being very lofty and abrupt.

This lake covers an area of over 200 square miles. Trout are found in great abundance near its outlet, but owing to the juxtaposition of subaqueous geysers they are not edible. Those caught, however, at the head of the lake, where the cold waters come rushing in in the shape of mountain torrents, are good. In the mud volcanoes we see another wonderful freak of nature. Down in these craters the hot mud can be seen thrown in many shapes. After sufficient steam has been generated, a huge mass is thrown several feet in the air, and, falling back into the crater, this action is repeated.

Prominent among the grand views of the Park are the falls of the Yellowstone, which afford a truly magnificent sight. The upper fall is 140 feet high, the grand falls are over 300 feet high, the foaming water rushing over the vertical falls, like a moving stream of snow. The mighty torrent, spanned by a rainbow, descends, with a thundering roar, that can be heard afar off. Below the falls the grand canyon begins, extending thence 20 miles down the river. The walls stand perpendicularly nearly 2,000 feet high. The Mammoth spring, near the northern boundary of the Park, is also a noted place, attracting many visitors by the medicinal properties of its waters. On Specimen mountain some rare curiosities in the way of petrifications are to be seen, some of them being standing trees, in the cavities of which some brilliant crystallizations are found, fine specimens of banded and clouded agates, opal, chaledony, carnelian and other rare stones can be picked up *in situ* on this mountain. The National park is destined to become the most famous watering resort of the world. Its mineral waters consist of great diversity, and is infinitesimal and replete. No tourist can ever regret a visit to the great wonderland and for a few weeks consult nature's sanitary domain and witness her grand and unique sceneries.

FISH AS BRAIN FOOD.

Since during the acts of sensation and intellection phosphorus is consumed in the brain and nervous system, there arises a necessity to restore the portions so consumed, or, as the popular expression is, to use brain food. Now, as every one knows, it is the property of phosphorus to shine in the dark, and as fish, in a certain stage of putrefactive decay, often emit light or become phosphorescent, it has been thought that this is due to the abundance of phosphorus their flesh contains, and hence they are eminently suitable for the nourishment of the nervous system, and are invaluable brain food. Under that idea many persons resort to a diet of fish, and persuade themselves that they derive advantage from it in an increased vividness of thought—a signal improvement in the reasoning powers. But the flesh of fish contains no excess of phosphorus, nor does its shining depend on that element. Decaying willow wood shines even more brilliantly than decaying fish. It may sometimes be discerned afar off at night. The shining in the two cases is due to the same cause—the oxidation of carbon, not of phosphorus, in organic substances containing perhaps not a perceptible trace of the latter element. Yet, surely no one found himself rising to a poetic fervor by tasting decaying willow wood, though it ought on these principles to be a better brain food than a much larger quantity of fish.—*Dr. J. W. Draper.*

RAILROAD CONSTRUCTION IN 1878.—The *Railroad Gazette* recently gave a revised and corrected statement of the railway mileage of the United States added during the year 1878, as follows:

Year.	Miles.	Total Miles.
1877	7,340	127,600
1878	2,878	130,478
1874	2,922	133,400
1875	1,561	134,961

We have a total of 82,064 miles in the country at the beginning of 1879.