

ming across with an end of the rope in his teeth. By the aid of this, the detachment were enabled to keep their feet in crossing, though with extreme difficulty, as the bed of the river was uneven and rocky. They all however arrived in safety on the left bank about sunrise.

"After passing the region of inclined sandstone, which is about two miles in width, they began to rise ^{upward} what may be considered the base of the mountain. As the day advanced the heat became oppressive, and they found themselves somewhat exhausted before they had crossed the sandstone hills, which appeared so inconsiderable from our encampment that the labour of crossing them had been almost forgotten in estimating the toils of the day. The first range of primitive rocks they found far more abrupt and rugged than the sandstone hills they had already passed. Its sides are destitute of vegetation, except a few prickly pears and yuccas, with here and there a stunted oak or juniper, and so steep that great exertion as well as the utmost caution are necessary in ascending.

"The rock is an aggregate of feldspar and hornblend, approaching in character some of the common varieties of Sienite. On the eastern ~~upward~~ side, where the feldspar is in the greatest proportion, it is flesh-coloured and its structure ~~is~~ crystalline, the fractured surface of the mass being uneven like that of coarse granite; advancing towards the west, hornblend was found more and more predominant, and so arranged as to have, in the mass, a laminated appearance. The natural fissures or cleavages between the laminae run nearly in a perpendicular direction, giving the rock the columnar structure of trap, or greenstone. As they proceeded, a few interesting insects and plants occurred to reward their labours. But these impenetrable and naked rocks are the abodes of few living beings either animal or vegetable. In the crevices where a scanty soil has accumulated, is here and there planted a ~~hardy~~ evergreen, whose short and gnarled trunk, and recurved inflexible branches, seem to proclaim the storms it has withstood, and the centuries during which it has vegetated.

"The design of the party had been to cross the first range of the mountains and gain the valley of the Platte beyond; but this they found themselves unable to accomplish. After climbing successively to the summit of several ridges, which they had supposed to be the top of the mountain, they still found others beyond, higher and more rugged. They therefore relinquished the intention of crossing, and began to look for the best way to descend to the bed of the river, which lay on their left hand. Here they halted to rest for a few

(Continued on 144)

moments, and exposed a thermometer in the shade of a large rock. The mercury fell to 72° ; in camp at the same hour, it stood at 86° . They were so much elevated above the river, that although they could see it plainly, it appeared like a small brook of two or three yards in width, white with foam and spray caused by the impetuosity of its current and the roughness of its channel. They could distinguish two principal branches of the Platte, one coming from the northwest, the other from the south. A little below the confluence of these branches, the river turns abruptly to S.E., bursting through a chasm in a vast mural precipice of naked columnar rocks.

"About noon the detachment commenced their descent, which cost them no less exertion than their ascent in the morning. Their fatigue was aggravated by thirst, as they met with no water nor any shade except that of projecting rocks in the higher parts of the mountain. They chose a different route from that which they had taken in ascending, intending to descend the river, with the hope of being able to travel along its bed. They were obliged to assist each other in lowering themselves down precipices, which they would have found it impossible to pass singly. On the southern declivity of the mountain they met with a few ripe currants, but these were hard and juiceless, of a sweetish taste, and aggravated instead of alleviating their thirst, and were probably the cause of a violent headache which several of the party were affected soon after eating them. There were also found a few large and delicious raspberries, of a species approaching the flowering raspberry (*Rubus odoratus*), but with smaller leaves and a more branching stem.

"After descending from the more precipitous parts about the summit of the mountain, they crossed a long and rugged tract, buried and rendered almost impassable by boulders and fragments which had fallen from above, and were at length so fortunate as to find a spring of cool water and a shade in a narrow ravine, where they sat down to rest, and dine on the provision they had brought.

"The men who were with them stopped in the same ravine, a few rods below. One of these, immediately after drinking the water, was violently attacked with headache, vomiting, and purging, which increased to such an alarming degree that he was presently unable to stand upon his feet. As it was feared he would not soon recover strength enough to walk, Mr. Peale undertook to return alone to camp, and give notice of his situation, and return with medicine and assistance.

"He descended along a rough and obstructed ravine until he arrived at the Platte, but found the valley so confined as to be impassable,

Footnote
for N. 2. — F. W. C.

and again directed his course across the mountains, towards the north-east, and after a most rugged and fatiguing march of about six miles, arrived at camp late in the afternoon. Here he found several of the party suffering in a similar manner, but not so severely as the man he had left in the mountains. Two men were immediately despatched with some medicines, in search of the disabled party.

"The spot where they halted was several miles within the mountains, and elevated nearly to the limit of phænogamous vegetation. The common hop (H. lupulif) was growing in perfection, also the box elder (Acer negundo, Ph.), the common sarsaparilla of the Eastern states (Aralia nudicaulis), the spikenard (A. racemosa), and many other plants common to the Alleghanies and Green mountains. After waiting about two hours, the sick man had so far recovered as to be able to stand upon his feet, and to walk a little. They therefore relieved him of his gun and other luggage, and moved by short stages towards camp, where they arrived at a late hour of the night.* The men who

Trout
"Among many plants collected in this excursion, some of them new to us, we recognized the bear-berry (Arbutus uva-ursi, L.), an inhabitant of the mountainous districts of New York and New England; also the Dodecatheon integrifolium, Ph., and a beautiful little plant referrible to the genus Mentzelia of Plumier. On the higher parts of the mountain, an oak is common, approaching in character the Quercus banisteri, Mx.; also a small undescribed acer, the Juniper communis and J. virginiana. In the ravines, the Rhus toxicodendron, Spiraea prunifolia, Ac.; and at the base of the mountains, the Prenanthes runcinatum, Saxifraga hivalis, L., a Cerastium, Ac."

~~had been sent out to their assistance, returned some time afterwards, having sought for them without success.~~

~~had been sent out to their assistance, returned some time afterwards, having sought for them without success.~~

"In the morning of the same day, soon after the departure of Dr. ~~James~~ James' detachment, two of the party passed into the mountains ^{the} ~~on~~ left*

Trout
"Left in ascending: really the right or south side.— P. W. C. side of the river; they experienced much difficulty, and underwent much labour in scaling the steep ascents, and some hazard in descending the precipitous declivities which marked their course. The timber was small, scrubby, and scattered in the most favoured situations, and many of the solitary pines, which occupied an elevated position, had evidently been the sport of furious tempests, being rived and seamed by lightning.

To the right, and easy of access, was a projecting rock, supporting a single humble cedar in one of its fissures, from which a stone let fall, was received into the torrent of the river which washed its base. The huge rampart of naked rocks, which had been seen from below to

stretch across the valley, was now in nearer view, the river whirling abruptly around the acute angle of its extremity, and offering, at its superior edge, an embattled outline. They ascended a primitive mountain which seemed to be of superior elevation, in order to overlook the western ranges, but they here found their horizon bounded by the succeeding mountain, towering majestically above them. To the east, over the tops of a few inferior elevations, lay expanded, like an ocean, the vast interminable prairie, over which we had so long held our monotonous march. The undulations which vary its surface, now disappeared, and the whole lay like a map before the observer. They could trace the course of the Platte, and number the streams they had crossed, and others which they had before passed near, by the slight ^Mfringing of timber or bushes which margined their banks, and by an occasional glimpse of their streams, shining like quicksilver, and interrupting and varying the continuity of the plain, as they pursued their serpentine course. The atmosphere was remarkably serene, and small clouds were coursing over the surface of the heavens, casting their swiftly-moving shadows upon the earth and enhancing the beauty of the contrast, which the long lines of timber afforded, to the general glare of light. After contemplating for some time the beauty and extent of the scene, their attention was attracted by a moving point, rendered occasionally visible by reflecting the rays of the retiring sun. This object was our white flag, waving ⁱⁿ a gentle breeze and revealing the position of our camp, the only spot in the boundless landscape where the eye could rest on the work of human hands."

While these two parties were absent, exploring the mountains, astronomical observations were attempted ~~at~~ camp; but in the middle of the day the moon was too near the sun, and in the evening the sky was cloudy.

"The sickness experienced by almost all the party, was probably occasioned by eating currants, which were abundant about the camp. It is not to be supposed, this illness was caused by any very active deleterious quality in the fruit, but that the stomach, by long disuse, had in a great measure lost the power of digesting fruits. Several continued unwell during the night."

On the morning of the 8th*, the expedition left this camp and pro-

*Printed "9th" in the narrative; but context and latitude entries show it was the 8th.

ceeded on its way, "travelling somewhat east of south, along a small tributary of the Platte" ^{*} now known as Willow creek. "The bed of this stream lies from north to south, along a narrow valley, bounded on each side by high cliffs of sandstone."

Ascending Willow creek to its source, they "crossed an inconsiderable ridge which separated it from the valley of Defile [i.e., Plum] creek. The latter, they "ascended to the place where its principal branch, East Plum creek, "descends from the mountain."

Here, on East Plum creek, apparently a mile or so below the present town of Castle Rock, they encamped; and here their headquarters remained not only for that evening but for the following day (9th) which was Sabbath, and till the morning of the 10th (or, as the narrative seems to make it ~~by~~ inadvertently, the 11th). Near this camp, the creek had numerous beaver dams and looked "rather like a succession of ponds than a continued stream. As we ascended farther towards the mountains, we found the works of these animals still more frequent."*

*The phrase, "ascended farther towards the mountains," shows that the previous expression, "place where its principal branch descends from the mountain," used to describe their camp, was not meant to imply a locality at the foot of the granite declivity, but merely ~~to~~ to indicate the principal branch, ~~which descends from the mountain~~ not far above the place at which, descending from the mountain, or divide, it joins the western branch, to form Plum creek proper. This interpretation is also called for if we compare the stated latitude with any good modern map. — F. W. C.

No statement is ~~published~~ given for the 9th, except that for the alleged 9th, chronicling the journey from Platte canon to East Plum creek, which, as already said, pertained to the 8th; but the astronomical tables show that observations were taken at this camp on the evenings of both 8th and 9th, and that the latitudes deduced therefrom were respectively $39^{\circ} 23' 52''$ and $39^{\circ} 23' 29''$, making the mean latitude of the camp $39^{\circ} 23' 40''$ N. The geological and other observations ~~made~~ by Doctor James under "9th", possibly cover both dates.

In the country traversed on the 8th, and surrounding their camp of evening of 8th to morning of 10th, they "saw masses of sandstone bearing a striking resemblance to colossal ruins, also some insulated hills with perpendicular sides, and level summits, ~~with~~ horizontal strata. For a small portion of the upper part of their elevation, their sides are nearly perpendicular, but their bases are surrounded by an

extensive accumulation of debris, sometimes rising nearly to the summit." One of these "peculiar tabular hills which mark the border of the secondary region," some of the party ascended. Doctor James describes it, in part, as follows: ~~1000~~

"The summit of the hill is of an oval form, about 800 yards in length and 500 in breadth. The elevation is about ~~1000~~ feet, and the height of the perpendicular precipice, from the summit of the debris to the top of the hill, about ~~50~~ fifty." Of its structure, he writes, "horizontal strata of sandstone and coarse conglomerates are exposed on its sides, and the summit is capped by a thin stratum of compact greenstone. The loose and splintery fragments of this rock sometimes cover the surface and make a clinking noise under the feet like fragments of pottery."

The preceding description, together with the statement that to the west of ~~the~~ this mesa was "a valley about one mile wide, having a scanty growth of pine and oak", and that to the west of that was "a ridge of sandstone about 300 feet in height, with strata inclined to the west," enables us to identify the particular mound which the expedition ascended, as the one now known by the name of and which stands about miles and miles of the

~~pretty little sheet of water called Palmer Lake. The cap-rock, which Doctor James calls "greenstone", is rhyolite or rhyolitic tuff.~~
~~It was from this mesa that the expedition first caught its first glimpse of Pike's Peak, and its bearing found to be S. 50° W.~~

While the main party was at the camp on a more easterly branch, of East Plum creek, several persons ascended one of the western heads of ~~the creek~~, to an elevation of one or two thousand feet in the granite mountains. As they travelled along the bed of this stream, they found the several rock formations beautifully exposed, and in the following order, commencing from the alluvial of the plain on the east.

"First— Horizontal sandstone, embracing extensive beds of coarse conglomerate, and commonly of a light gray or reddish-yellow colour.

"Second— Fine compact gray sandstone, containing a few impressions of organic remains, resembling those in the sandstones of coal formations. This rock is inclined at an angle of near 20° toward the west. It forms continuous ranges of hills, not difficult of ascent from the east, but their western declivities are abrupt and precipitous.

"Third— Lofty and detached columns of sandstone of a reddish or deep brown color. These are irregularly scattered through a narrow woodless valley. Some of them rise probably 300 feet above the common level of the plain, and are so steep on all sides as to preclude the possibility of ascent; others are accessible at some points,