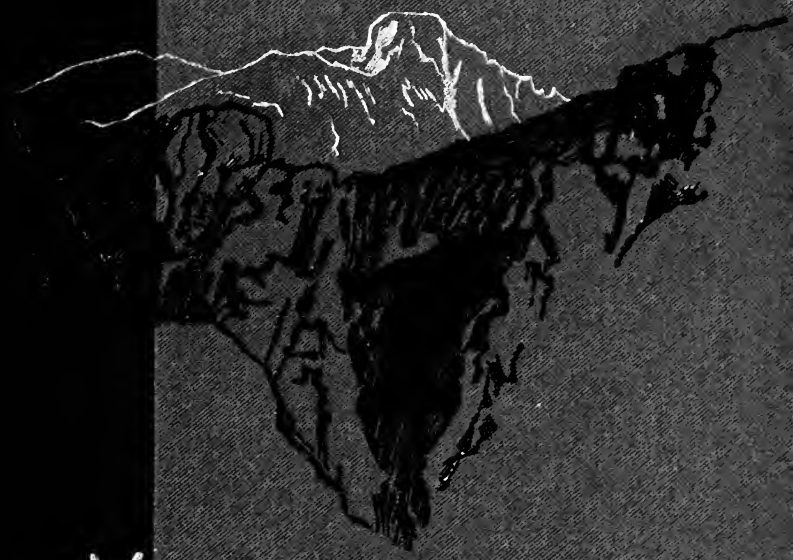
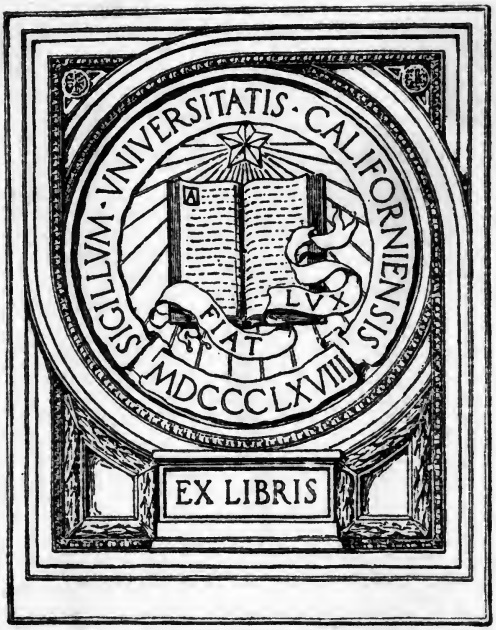
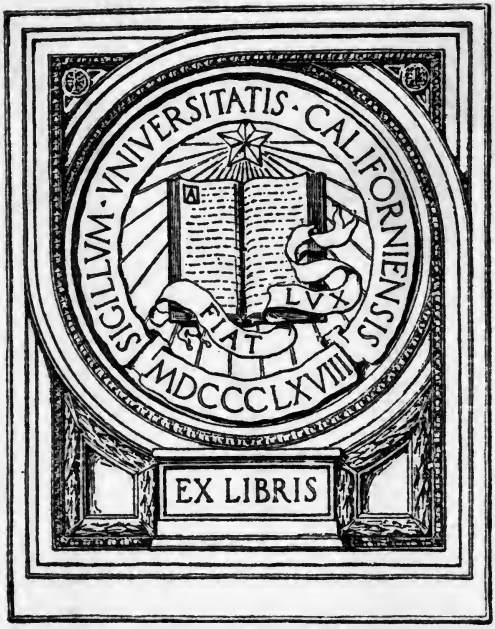


MOUNTAINEERING IN COLORADO

FREDERICK H. CHAPIN.





MOUNTAINEERING IN COLORADO.

LONG'S PEAK FROM TABLE MOUNTAIN.

Mountaineering in Colorado

The Peaks About Estes Park

BY

FREDERICK H. Hastings CHAPIN

BOSTON

APPALACHIAN MOUNTAIN CLUB

1889

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John Wilson and Son, Cambridge.

To the Memory

OF

A. L. S. C.

WHO WAS A LOVER OF THE MOUNTAINS AND OF ALL THAT IS BEAUTIFUL AMONG THEM, AND WHOSE COMPANIONSHIP INSPIRED THIS VOLUME.

PREFACE.

THE day for making striking discoveries in the Rocky Mountains is past. It is now three centuries and more, since Alvaro Cabeça de Vaca with three followers traversed the continent from the Gulf of Mexico to the Spanish settlements on the Pacific coast. His wanderings led him through the region now known as New Mexico; thus he beheld and crossed the southern Rockies. Nearly a hundred and fifty years later, two French explorers, the brothers La Vérendrye, crossed the prairies from the great lakes, and, reaching a point near the sources of the Yellowstone River, were the first white men to look upon the northern peaks. Since the day of these early adventurers the exploring parties of Lewis and Clark, Pike, Long, and Fremont have opened the way; and more recently the better equipped expeditions of Hayden, Powell, King, and others have explored the sierras and cañons, especially those of Colorado.

There remain only byways and corners to be more thoroughly searched; and fortunate will be the adventurer who finds anything of note that has not already been seen and written about by the indefatigable members of survey parties that have preceded him.

But in climbing some of the peaks in the autumn of 1886 I saw much that was novel, and during succeeding seasons other remarkable sights forced themselves, as it were, right before my camera. Mr. Ferguson, a pioneer of '59, at whose ranch I stayed while in Estes Park, told me, on the day of my leaving, "I reckon no man ever came into this Park before, and saw as much as you have seen." Some of the success which was attained in certain carefully planned expeditions was due to luck; more must be placed to the credit of the clear skies and continual sunshine of Colorado.

Though I have made many ascents in other parts of the Rocky Mountains, the peaks most thoroughly explored are those that surround Estes Park; for this reason it has been decided to limit the present descriptions to these northern peaks. The earlier ascents have proved very useful, however, in enabling me to identify different points seen in extended mountain views.

It will be noticed that on several occasions we added to the nomenclature of the range; this, however, was done only in cases where we felt compelled to have a name for mountain or snow-field. Wherever an expedition is recorded as new, the claim is made on the authority of the frontiersmen who have lived longest in the mountains.

With the exception of records of second expeditions on the same mountain, the narrative follows the order of the dates of the ascents.

Upon the illustrations depends much of the interest of the book. With but few exceptions they are made directly from negatives taken in my various expeditions. They cost hard work and great care; to obtain them our packs were often heavy. The reproductions were made by the Boston Photogravure Company.

Parts of the chapters on Long's Peak, Mummy Mountain, and Ypsilon Peak were originally printed in "Appalachia," the journal of the Appalachian Mountain Club; and certain episodes related in Chapters II. and VII. appeared in "Scribner's Magazine" for February, 1889. I am under great obligations to Messrs. Charles Scribner's Sons for their kind permission to print certain pages, and also for the use of their engraving "Photographing the Big-horn," which

accompanied the original text. It has been reduced by a photographic process.

It is believed that the catalogue of the flora of Estes Park, printed as an appendix, will be of interest to many who visit the Rockies. The specimens named were for the most part collected by my wife during her two summers' residence in the Park. Coulter's "Manual of the Botany of the Rocky Mountain Region" is the authority followed. The list has been revised and extended by Mrs. George W. Thacher, an indefatigable botanist and an ardent lover of Colorado's mountains.

It is very flattering to me that the Appalachian Mountain Club, for whose members many of the articles forming this volume were primarily written, should have deemed them worthy of publication under its auspices. Lest the general reader should be disturbed by the personalities of the narrative, the author would remind him that the style is one customary in the large and increasing literature of mountaineering.

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MOUNTAINEERING IN COLORADO.

CHAPTER I.

ESTES PARK.

THE mighty ranges of the Rockies come sweeping down from the north, through Montana and northern Wyoming, as several nearly parallel ranges, occupying a great breadth of country, in some sections as much as four hundred miles. South of Fremont's Peak the several ranges give place to a high plateau, over which the Union Pacific Railroad finds a way from Cheyenne westward. From this plateau the mountains rise again to great heights and enter central Colorado as two distinct ranges, — the Medicine Bow Mountains on the east, and the Park Range farther to the west. The Front Range, so called from its geographical position, rises abruptly from the plains in northern Colorado, and is marked by such lofty summits as Hague's Peak (13,832 feet)

and Long's Peak (14,271 feet), in the north, and Pike's Peak (14,147 feet), near the end of the range, a hundred miles farther south. Then comes a break in the chain, where the Arkansas River flows through deep cañons on its journey to the plains. South of this break the Wet River Mountains and the Sangre de Cristo Range mark the eastern borders of the Rockies of Colorado.

Standing upon some high peak in the centre of the great ranges that front on the plains, one sees, a hundred miles away toward the New Mexico line, that noble peak of the southern Rockies, Sierra Blanca. In the opposite direction, one hundred miles to the north, towers Long's Peak, its mighty mass dwarfing all other mountains near it. To reach Sierra Blanca, the traveller ascends by the famous railway, with its mule-shoe curve, over Veta Pass, through scenery of world-renowned grandeur; but if he will climb the slopes of Blanca Peak to timber-line, he will behold scenery that will for the moment almost obliterate from his mind the fact that there is such a place as Veta Pass.

To reach the vales near Long's Peak, the old stage-coach must serve the tourists' purpose. The narrow-gauge line of the Denver, Utah, and Pacific Railroad, now a link in the great Burlington sys-

tem, lands him at Lyons, the last station on the plains, at the base of the range, and a stage-ride of thirty miles brings him to the beautiful valley of Estes Park. Here, too, as in San Luis Park and in the neighborhood of Sierra Blanca, remarkable as are the valleys and foot-hills, there are scenes among the mountain tops which far surpass in beauty and sublimity any of those viewed along the railway or stage lines. To appreciate the wonders of the sierras, one must climb among them.

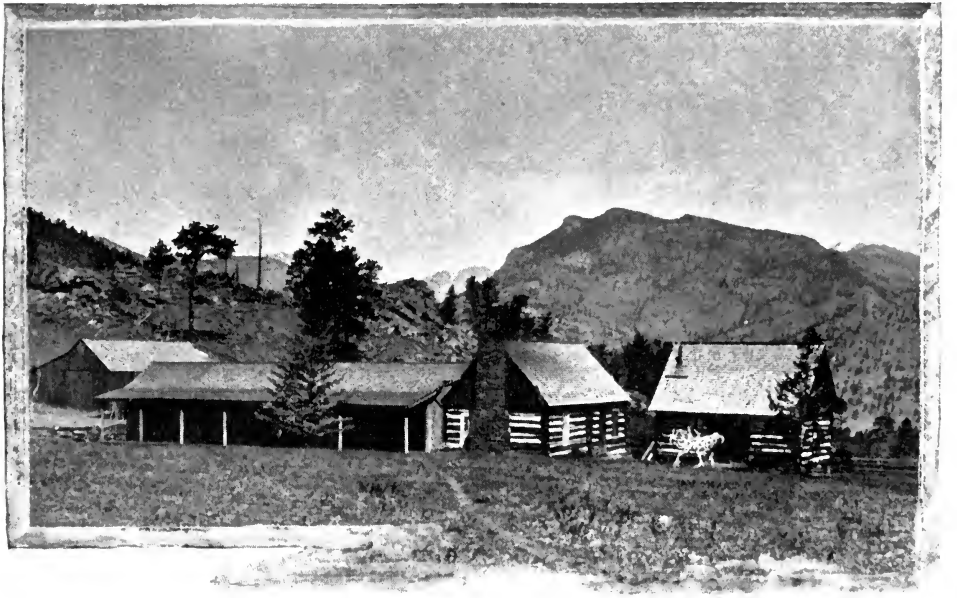
Estes Park, in which are many picturesque scenes, is the natural centre for mountaineering in northern Colorado. It is situated near the Wyoming line, and about seventy miles northwest of Denver. Its elevation is about seven thousand feet above the sea. There are about ten thousand acres of pasture-land bordering the banks of the Big Thompson Creek and the smaller streams, and these have all been taken up as homestead claims by pioneers. Seven thousand acres have passed into the hands of an English company, which, I was informed, were originally intended for a great game preserve, but the ranch interests are now predominant, and large herds of cattle of graded Hereford breeds roam through the pastures. Besides the ranch of the English company, — which

owns a small hotel here, — there are five other ranches in the Park; and at one of these, Ferguson's, we made our headquarters for two seasons.

The early history of Estes Park has been told; but the place is so little visited, except by the dwellers on the plains near the foot-hills, that a few words describing its present condition and its settlement may be of interest.

The precious metals not being found in this region, no railway winds through the cañon of the St. Vrain, nor through the rough Muggin's Gulch. The whistle of the locomotive is never heard in the valley; and except that, instead of the primitive elk and deer, a few cattle roam through the pastures, and that an occasional wire fence closes the narrow entrance from one valley to another, little is changed from the original aspect of the country.

Mr. Lamb, who lives at the immediate base of Long's Peak, settled there in 1876. Mr. Ferguson came into the valley some fourteen years ago. Originally from Missouri, he was a pioneer of '59, crossed the plains with an ox-team, and settled in the lowlands of Colorado; but he was unfortunate in having his crops destroyed by grasshoppers. He came up into the mountains prospecting, and from the Loveland divide had his



Ferguson's Ranch.

first look at Estes Park. He quickly made up his mind to settle in it. He still tells, with a glow of enthusiasm, of his first view of the valley. Even after taking up his claim in this out-of-the-way place, he was troubled again by the insect that had caused his first great loss; but observing the approach of the pest up through the narrow glade that leads from Estes Park to his higher claim, he felled timber, made a barricade, set fire to it, and saved his crops. His ranch is delightfully situated, and, though a mile from the river, is supplied with cold clear water from a never-failing spring. From the cabins around Ferguson's ranch a magnificent view is obtained of the great Mummy Range; and the sunset lights on the cliffs of Lily Mountain, to the east, are indescribably beautiful. Especially is this true during the waning of the rainy season, if the slight rainfalls of June and July can be so called. The mornings during this season are clear and beautiful; but in the early afternoon the great peak of the Mummy will perhaps throw off its cloud streamer, and in an hour or two thunder will rattle among the crags of Sheep Mountain, and the rain pour down upon the dry pastures. In a few hours the sun almost gains the mastery once more; and though the pine-belts and valleys may

be covered with ascending vapors, the peak of Lily will glow with gorgeous hues. It is probably some such spectacle as this that makes one of the early writers about this valley claim for it the finest scenery in the world. This statement is hardly justified, for we cannot apply to the surrounding mountains, however beautiful they may be, the words of Hiouen Tsang in describing a Himalayan view: "The top of the mountain rises to the sky." * Yet Long's Peak, with its great altitude, is truly a cloud-piercer. Like Mount Hood, which has probably gone up and down in the scale of estimated heights more than any other mountain in the West, its stated altitude has been subject to marked variation. It was given in 1857 as 15,000 feet, in 1879 as 14,700, while its present accepted elevation is 14,271 feet.

Near by Ferguson's is Mary's Lake, a little sheet of alkaline water, Lily Mountain rising on the south, Sheep Mountain on the west, and Prospect Mountain on the east. It was formerly a great resort for big-horn, elk, and deer, which came in great numbers to the lake, as they would to a salt-lick; and many have been shot there. Mr. Ferguson told how in those days, when hunted

* Quoted by Andrew Wilson, Abode of Snow, p. 274: Putnam, 1875.

near the lake, the big-horn would scramble up the steep isolated ledges which rise out of the open country to a height of one or two hundred feet. They were then easily surrounded, and escape from rifle-armed hunters was impossible. This, however, was in the early days of the country's settlement, and before the big-horn had learned the ways of hunters.

This very wild animal is undoubtedly the rarest and most interesting game found in the Rocky Mountains of Wyoming and Colorado.* Hunters and ranchmen assured me that it had entirely

* The accompanying illustration of the head of a young ram is made from an animal which Mr. Ferguson shot on the banks of Mary's lake. The circumference of the horns in the illustration, at the base next the head, is thirteen and three-fourths inches; length of horn, nineteen and a half inches.

forsaken the Front Range, and was to be found only in the mountains beyond North Park, or in Wyoming; but I was able to prove it otherwise. The higher sierras retain all their primeval wildness. Many of the peaks in the Front and Rabbit Ear Ranges remain unscaled, cañons among them are still unexplored, and dark forests which fill the upper valleys have never known the foot of man; so that the chance which the explorer runs of meeting with rare wild animals, sometimes of a ferocious type, makes mountaineering in the Rockies more exciting than in the older countries.

Aside from the deer, which are numerous, the most common large animal in Estes Park is probably the bear. The brown and cinnamon bear are the species generally met with. I am informed that there is perhaps no real difference between the two, for when a litter of cubs is found, some of the young ones are black and some are brown. Grizzlies are rarely seen; but it is related by ranchmen in Estes Park that during the summer of 1886 one made himself quite at home in the valley, and one night while wandering around killed several full-grown steers. Lamb, the guide to Long's Peak, says that he saw his tracks many times. A mountain lion was seen at Sprague's

ranch during the early winter of the same year, coolly prowling around and among the log-cabins.

Near Timber-line on Sprague's Trail.

As before stated, the principal visitors in this upland valley are from the low regions of Larimer County. Many of them bring tents and cooking utensils, and camp by the Big Thompson or the St. Vrain Rivers. The visitors at the ranches are from Denver and far eastern towns. Trout-fishing is the principal sport. Hunters are more attracted to the North Park, which one

may reach by Cameron's Pass. The lover of high mountain ascents finds a good field for novel expeditions throughout the range; for, with the exception of Long's Peak, the high elevations are rarely visited.

Some of these objective points are visible from Ferguson's Ranch; one has but to take a half-hour's stroll on Sheep Mountain near at hand, to behold a long line of noble peaks from a point where Albert Bierstadt made many studies for one of his great pictures.

CHAPTER II.

LONG'S PEAK.

I.

LONG'S PEAK is of great interest to the mountaineer. It is the highest point in northern Colorado, and its ascent is more difficult than that of any other peak in the range. It has been rather fancifully named the "American Matterhorn;" but when we consider that one side is actually inaccessible, perhaps it is worthy the comparison, — for the Matterhorn has been ascended by *arêtes* on all sides, though, of course, its easiest line of ascent is manifold harder to conquer than is the ordinary route of Long's Peak.

Before narrating our experiences on Long's Peak itself, perhaps it would be well to speak of several views of the mountain from points in and around Estes Park. One thing very noticeable is the fact that the mountain presents so widely different aspects when seen from the four points of the compass. From the plains to the southeast, two

SUMMIT OF LONG'S PEAK OVER CRAGS OF MOUNT HALLETT.

noble peaks appear as if of nearly equal altitude. From the top of Sheep Mountain, — a long range (9,000 feet) near Ferguson's ranch,—the final cone, only five miles away, demonstrates its superiority, and grandly lifts its head over the intervening wooded slopes of Estes Cone. Wind River Valley, which lies between Sheep Mountain and the main range, is 2,000 feet lower than Sheep Mountain; so from this elevation one may behold a slope of 7,000 feet leading up to the summit of the principal peak. Still more majestic is its appearance from the top of Prospect Mountain, eight miles distant and overlooking Sheep Mountain, which is then projected against the base of the great range. But by far the most striking view is that obtained from Table Mountain, a peak on the Continental divide, about six miles to the northwest. I imagine that very few persons have beheld Long's Peak from this direction; and the photograph from which the illustration that precedes this chapter was made, cost me many hours of climbing and much setting up of the camera and experimenting before this most characteristic view was obtained. The appearance of the noble mountain is like a citadel perched upon enormous bastions and protected by ramparts made by intervening walls of rock.

Mountaineers may realize, from examination of this illustration, what a splendid field it is for new expeditions, — either to follow the summit of the chain along the spur to the right, or to explore the upper cañons and glacial lakelets. The numerous lakes among these gorges add greatly to the picturesqueness of the views. A summer spent among these rock walls would present any number of varying excursions which would show to the explorer marvellous and enjoyable sights, with the bare possibility that he might find something that would add to our stock of knowledge. Members of foreign alpine clubs have thoroughly explored and photographed the ice districts of Switzerland, and partially so the Caucasus; but the noble work of the survey parties in the sierras of Colorado has not yet been supplemented to any great extent by individual effort. The same work remains to be done among the higher elevations of the whole great chain reaching from New Mexico to Alaska, that has been done by European alpine clubs in Switzerland, and is being marked out by the Appalachian Mountain Club in New England. Paths are to be made, trails to be cut, detail maps to be laid out, before the grandest scenes among the mountains can be shown to the tourist.

It is a rare occurrence in Estes Park to have four successive rainy days; but so it happened in the summer of 1887, from July 14 to 17. The season, however, had been very dry, and the parched ground needed the deluge which it received. The sun appeared at intervals during each of these days, but it would soon be hidden and the storm would continue. We had set several times for an attack on Long's Peak; but the weather had put us back, and we knew, from the whitened appearance of Mummy Mountain, that much snow was falling on the great range. At last, however, on Monday, July 18, we had a clear day, and made arrangements to start in the afternoon for Lamb's ranch, — which is situated at the base of the peak, — there to spend the night, and in the morning make an attempt to gain the desired summit. There were four of us in the party; and two of the number left Ferguson's at five o'clock, while with one companion I rode over after tea, arriving at Lamb's at eight.

Even this part of the expedition is full of interest. The road skirts the side of Mary's Lake, and leads through wide pastures for the first two miles; then passes up a steep hill, through a forest, with the stupendous cliffs of Lily Mountain hanging over the valley. This mountain is 11,453 feet in

height above sea-level, and its summit corresponds with the average of timber-line on the great range. The upper cliffs are steep and bare on the inner side, while on the eastern side, which is a gradual slope, heavy timber grows to the top; hence from the plains the mountain has an entirely different appearance, showing two black summits, and is called by another name, "The Twin Sisters." Lily Lake, quite a large expanse of water, lies at the base of the mountain, and gives it its name. As we passed the lake, we saw several mallard ducks on its surface.

Our host, Mr. Ferguson, tells this story: Many years ago, with one companion, he was shooting on the edge of this lake. They discharged their guns into a flock of mallards which were out on the water, but with no other effect than to cause the frightened ducks to fly over Sheep Mountain to another lake. Very soon he noticed them returning in his direction, and two of them flying in a straight line at as rapid a rate as possible, while the others bore away down the valley. The foremost bird struck the lake in the centre, and dived out of sight; and then Mr. Ferguson saw that the one following was a very large eagle, which, foiled in the pursuit, soared into a tree and alighted there. The hunters now emptied barrel after

barrel at the duck; but they could not frighten it out of the lake, where it remained until they finally killed it. The eagle, of course, escaped.

Lamb's claim is in a high, well-watered valley; in fact, it is almost a swamp in some places. The elevation is about 8,500 feet above the sea, making it about 1000 feet above Ferguson's ranch. Mr. Lamb senior took up a homestead claim here, some ten years ago, and for many years guided travellers up the peak; but for the past three years his son Carlyle has done this work, and had already ascended fifty-five times at the date of our visit. He is a strong, willing guide; and

Long's Peak from Lamb's Ranch.

he worked very hard for me, for our packs were heavy. Until my acquaintance with him began, he had never climbed any of the elevations west of Long's Peak. Lamb keeps a charming mountain-inn; the house, which is built of logs, is very comfortable, and our advance guard announced that they had been served to a remarkably good supper. All the supplies which he purchases he has to haul up from the plains, thirty miles distant. In the sitting-room of the house is a very large fireplace, made of rough stones, before which, while the logs were crackling and blazing, we sat till late in the evening, talking of the mountains; and when we did turn in, I did not go to sleep till after twelve, and was awake at three o'clock.

Perhaps the stories of our host had something to do with it; for the elder Lamb tells some very interesting ones of his many ascents of the mountain, the most exciting of which, without doubt, was that made in company with Mr. Sylvester C. Dunham, of Hartford, Conn., an account of which was published in the magazine "Good Company," April, 1881. Mr. Lamb's account of that day's adventure is a thrilling one, and Mr. Dunham's is equally so. When upon the summit of the peak, they were enshrouded in clouds; the

early morning had been clear, and the distant views grand; but a storm gathered on Mummy Mountain, and swept over the great range, culminating as an electric storm on Long's Peak. In Mr. Dunham's words, the cairn on the summit —

"hissed and crackled like a bonfire. We had sought it as affording shelter from the approaching storm, but we retired from its vicinity in a very informal manner. The cloud had now struck the base of the horn, and came boiling and rolling up the 'Trough.' Its advance guard of hard, sharp pellets of ice flew straight up the face of the cliff, and in another minute we were in the midst of the tempest, — a whirling volley of ice and snow, driven by an icy blast. Little points of white light danced in the air and beamed from points of the rocks; and muttering thunder, of which neither distance nor direction could be determined, accompanied the storm."

In speaking of the electrical effects, Mr. Dunham further states: —

"My own occupation [of a cavern] was attended by a violent shock, which fully convinced me that my head was burned bare as a potato. Only by the immediate investigation and the earnest assurances of my friends, was I convinced of my delusion. . . . After some minutes the iron-bound peak seemed to exhaust the energy of the subtle fluid wherewith the cloud was charged; and although the tempest con-

tinued with unabated fury, we had no longer to fear the weird and mysterious element which had surrounded us. We were still in the midst of a furious storm, but it was no longer a thunder-cloud in angry combat with opposing forces."

The snow-storm was so severe that Mr. Dunham and Mr. Lamb had many uncomfortable experiences before they reached the ranch at night; but that with electrical phenomena was, of itself, such as to make their ascent more worthy of note than any other expedition to the peak.

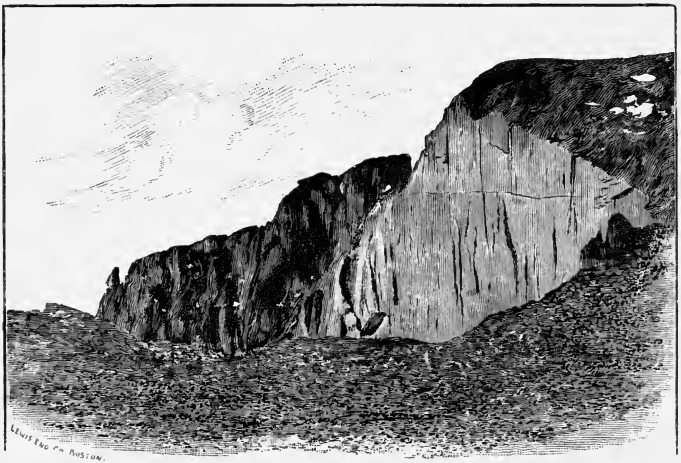
At four o'clock the following morning we had breakfast, consisting of ham and eggs, coffee and gems; and at 5.05 o'clock were on our way over the trail. The sky was cloudy, but the peak was clear. We rode up through spruce timber for about half an hour, and then through pines, where it was much steeper, and along the banks of a little torrent which runs down to the St. Vrain River. Until within a year this route has been the only one up the mountain; but lately a trail has been cut from Sprague's ranch at Willow Park, which joins Lamb's trail at the "Bowlder Field," though it is little used. We emerged above timber-line at 6.20 o'clock, and here were met by a snow-squall. However, the clouds were light, and a brisk westerly wind began to disperse them. As we rode

over the pasture-land, the sun almost broke through the vapor, and our hopes of a clear day were considerably brightened. The plains were free from haze, and all the foot-hills were sharp and clear.

I speak of this part of the trail as leading through pastures, and it certainly is a splendid grass country. Much more rain falls here than in the valleys, and the soil is moist and rich. The cattle, however, never go above the timber; and as the deer, big-horn, and elk have forsaken this mountain for the northwestern peaks, this sweet feed seems to go a-begging. The average altitude of timber growth on the northern slopes of the mountains is only a little above 11,000 feet, while on the southern side it is as much as 12,000 feet, especially where it can follow the water-courses.

We reached the edge of what is called the "Bowlder Field" at 7.30 A. M., and there tethered the horses in good grass and near plenty of water. At 7.45 we began the hard walk to the "Key-hole," — a cleft in the wall of the mountain, through which one must pass in order to climb the high peak from the west side, as the east face is inaccessible. The finest view of the great cliffs of the peak is obtained just before reaching the

"Key-hole." The face of the centre of the mountain is one nearly vertical wall of about 2,000 feet. There are but few so-called "precipices," even in Switzerland, which prove to be really worth the name when closely examined; but these walls are truly perpendicular from a point



about two hundred feet from the summit to a gorge far below the ridge which hides the base of the precipice. I shall refer to this marvellous wall again when relating the story of our descent.

At 8.40 A. M. we were standing in the "Key-hole," having made fairly quick time, considering

the delays occasioned by my having a camera along. Lamb carried my twelve sensitized plates and our lunch, while I carried the camera. I mounted it on the tripod when we left the horses, and had no serious trouble with it the whole day. In fact, there were but two places on the mountain where, while I climbed or descended, I had to hand the instrument up or down to the guide. At the "Key-hole" one looks down upon a grand amphitheatre, lying beyond the ridge just climbed. Over a deep gorge rises a mountain wall which hides the distance; and the vapor rolling up from the depths was continually changing and lifting, adding to the grandeur of the scene. No signs of animal or vegetable life were visible. Several lakes lay in the bottom of the gorge, or at the base of snow-fields on the opposite mountain.

The difficulties of the ascent of Long's Peak are frequently exaggerated. There is hardly a place on the mountain where the climber need use more than one hand to help himself up. About one hundred people have been upon the mountain annually for several years past; but this large number is made by parties, sometimes as many as twenty, coming up from Longmont or some town by the foot-hills, and all going up at once, — or trying to go up, for Lamb says that

many of them do not get beyond the "Key-hole." Many claim to be exhausted and out of breath, and lay it to the rarity of the air, but as most of these people are not in training for mountain climbing, this is not surprising: the same persons would probably fail in undertaking a similar walk at a lower elevation.

Immediately after leaving the "Key-hole," the ledge traversed is quite narrow, and if one should be very clumsy or careless and slip, a fall would probably be fatal, — for the rocks are placed at a very steep angle, and there is nothing to prevent a slide of at least a thousand feet to the gorge below. Yet the narrow table which runs around this side of the mountain is, on an average, about six feet in width, and there are good footing and flat surfaces of rock to step on; so there is not the least danger unless one should be dizzy. There have been no accidents on this mountain; although one death has occurred just below the "Key-hole," the result of over-exertion and utter exhaustion.

From the ledges we entered the "Trough," which is a deep gully running up between the main peak and a ridge of the mountain, on the right. This gully is quite steep, but free from snow and ice, although there is a large field of

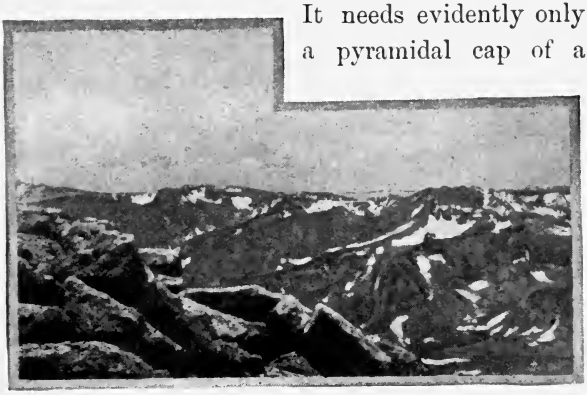
View from the "Trough."

snow on its side and base. There is a great deal of loose rock and debris strewn through it, and to traverse it is a good pull, but there is no actual climbing: it is simply a long walk. The mountain wall ascending on the right is very smooth and steep, but on the left the arête of the main peak is broken up into beautiful ledges, towers, and minarets; and as the rising vapors whirled and rushed over them, now covering and then partly or entirely exposing the cliffs, the effect was wonderful. From the table-ledges we had been able to look down 2,000 feet upon the lakes and upon a little stream which is one of the fountain-heads of the rushing Big Thompson River; but from this curving trough the view was upon the distant snow-ranges.

We reached the top of the "Trough" at 10.15. Here the plains and the mountains above Boulder Cañon come into the prospect; but the most remarkable sight is the view of some wonderful columnar cliffs on the southeast spur of the peak. The upright shafts, though not detached from the face of the cliff, are cubical on their outer surface, and seem to be exactly perpendicular. The rocks on the other portions of this spur, which seem not to be so firm in texture and not tipped to vertical position, are more easily wasted and worn away

by aerial forces; and this probably explains the formation of the long jagged *arête*, seen to the right of the tower in the frontispiece. This *arête* is but one of the many broken ridges of the peak.

After a short rest we climbed the roof of the peak, and at 10.50 stood upon the summit, — a large flat surface, composed of slabs of granite. It needs evidently only a pyramidal cap of a



View from Long's Peak Westward.

thousand feet, to make it an ideal summit. All was clear to the east; we could see the smoke from the smelters of Denver, and, far beyond, the parched plains, — the most extensive view I have ever had in that direction. The great range of Pike's Peak, a hundred miles to the south of us, was so clear that I could recognize three differ-

ent summits in the chain, that I had ascended. Cheyenne Mountain, the eastern spur of Pike's Peak, was a landmark on the edge of the plains. We could see the bluffs east of the town of Cheyenne, far in the north; and towards the west there were wonderful cloud effects over the great ranges.

Some snow and hail now fell on the summit, and we had to be content to await the clearing of the storm, and meanwhile study the view and landscape in the east and trace the course of rivers on the plains. But even when the clouds were thickest in the west, there would be openings which would let us look into deep gorges, or show us some peak in the Rabbit Ear Range in the west, or the Medicine Bow group, the mighty range of mountains in the northwest. Our most distant view was far away to the snow-caps in Wyoming. I looked down over one low divide where Lamb pointed out trees growing on the Pacific slope. While the west was obscured, we spent some time gazing into the crater-like basin on the east peak, the sides of which are smooth and steep, but not as abrupt as the face of the peak we stood upon.

For a while we thought we should have no clear views of the western peaks; so I set up

the camera at the west end of the summit, and took two pictures of the partly exposed ranges, to secure something in the way of a view from the top, even though it should be a cloud scene; for I feared the storm would grow fiercer, and the mist envelop our peak for the rest of the day. But soon the wind drove the covering from the Front Range, and Middle Park, with Grand River cutting a clear line through it, and all the snow mountains which encircled the high valley, were plainly shown to our expectant eyes. Then, as we waited, the high pile of cloud, with its lower fold resting on the range, was driven to the southeast, and the peaks — Gray, Torrey, and the Mountain of the Holy Cross — gradually appeared; and with the exception of the great mass of Mummy Mountain, we had secured a complete view of all the peaks and ranges ever visible from this famous elevation. A long streamer of cloud stretched away from the top of the Mummy (which is the next peak in height to Long's Peak, in this district); but it held fast to the summit, and refused to reveal the crest of the mountain. The Elk, Rabbit Ear, and Medicine Bow ranges were now clear. Estes Park lay spread out like a quiet green pasture, and Willow Cañon made a deep black cut up through the mountains to the

northwest, towards the Medicine Bow Range. A long snow-line marked those mountains.

We reluctantly left the top at one o'clock, having remained there two hours. The outlook facing us going down the "Trough" was grand; the smooth surface of the rocks now on our right, and the towers and broken ridge on our left, made a magnificent frame through which to view the distant ranges. In this gully Lamb had a fall, and for a moment I was dazed at seeing my much-prized plates spinning in the air; but luckily there was nothing damaged, as I found, much to my wonderment, when I unpacked at night.

The "Key-hole" was gained at 2.10 P. M.; and then we followed down the "Bowlder Field" under the stupendous precipices of the peak. On this field, covering perhaps a hundred acres, are strewn great slabs of granite, — some as much as twenty feet in width and thirty feet in length, — and between them are heaped bowlders, great and small. These rocks must have been levelled by the action of frost, which split them from the once higher ridges, and left them here in past ages, in the days when Long's Peak may have had the hypothetical cap which I have desired for it. Even now this great mountain shows signs

of disintegration; the northern precipice is scarred and worn, and seamed with enormous cracks; slabs are loosened from its cliffs, and hang, to all appearance, like thin pieces of slate from its sides. But all the despoiling of the mountain, upon this face, is by vertical cleavage; and there are no changes going on that will destroy the absolute precipice which now exists.*

I have already referred to precipices and so-called precipices. It is probably true that Americans are more familiar with the Alps than with the Rocky Mountains; for the high valleys of Switzerland are so easy of access, and the distances are so small, that one can cross many glacier passes and ascend important peaks with much less trouble than he can visit such an out-of-the-way place as Estes Park and climb the mountains which surround it. Many are undoubtedly familiar with the view of the Matterhorn as seen from Zermatt. The east face — the one seen from Zermatt — is generally spoken of as a precipice, and looks like one too; but Whymper said of it, in his

* It seems to me that the explanation of the formation of this cliff is not easily found; but I would refer others who, like myself, may have an interest in the question of the general formation of the range, to Clarence King's "Report of the Geological Exploration of the Fortieth Parallel," article "Colorado Range," Section I., by Arnold Hague.

account of his seventh attempt to climb the mountain, "that the east face was a gross imposition; it looked not far from perpendicular, while its angle was, in fact, scarcely more than 40°." The ascent of the Matterhorn from Breuil is probably one of the most difficult climbs that has ever been attempted and accomplished; yet when standing above Breuil, one can see plainly how the mountain is broken up into ledges, and in no place is there a vertical surface of more than 500 feet. A peak of peerless beauty in the Alps is the Zinal-Rothhorn, near Zermatt. Placed far back on the range, this mountain is not at all popular, and is not even visible from Zermatt, the great mountaineering centre. But those who have looked upon its steep sides from a near view-point would say that they had looked upon a precipice, and one who has scaled its cliffs would certainly carry away a vivid impression of the vertical. Although made up of a series of precipitous ledges, the mountain-side falls far short of making straight up and down lines. The opposite side of the Rothhorn also makes a grand rock-slope, too steep for snow to lie on, yet that is also placed at an angle of about 40°. But the tower on Long's Peak exposes an unbroken front of 1,200 feet, as smooth as the side of Bunker Hill Monu-

ment. Former estimates have credited the precipice with 3,000 feet of altitude. We should have to look to the walls about the Yosemite, to find

The Cliffs of Long from the East Side.

anything superior in actual vertical heights to those of the Front Range. I know that our party lingered long gazing at this sheer cliff; and only

the fact that we were liable to be benighted in the forest forced us to hurry away.

We reached the limits of the "Bowlder Field" at 3.30 P. M., and mounting our horses were at Lamb's at 5.20 o'clock. But, sad to relate, as we reached the lower edges of timber-line, we heard thunder booming on Estes Cone and saw flashes of lightning on the upper peaks. The dashing rain was immediately upon us, and we rode into Lamb's enclosure at a gallop, camera and sensitized plates dancing on my horse's back at great risk, and all of us drenched by the torrents which were poured upon us.

II.

HIGH up on the northeastern slopes of Long's Peak is a lonely lake situated under the remarkable precipice. Not easy of access, I was unable to visit it in 1887, but put this trip down in a list of expeditions for 1888. Lamb wrote me during the winter reminding me that this alone was worth another trip to Estes Park, especially as no one, to his knowledge, had ever been beyond the lake to the base of the perpendicular cliff.

For the purpose of accomplishing this long-

contemplated trip, accompanied by my wife I drove in a buckboard from Ferguson's to Lamb's

Lake on Long's Peak, Lily Mountain in the Distance.

early in the morning of July 11. The valley in which Lamb's cabin is located lies between Lily Mountain on the east and Long's Peak on the

west. Finding that we had the time for it, Carlyle Lamb and I ascended Lily Mountain in the afternoon. We started for a point midway between the north and south peaks. These peaks I have already referred to, as being called on the plains the "Twin Sisters." In the ascent we found a cold spring immediately under the final ledges of the south peak. Lamb informs me that good springs burst out from the ledges all along the west side of the mountains. It hardly seems as if enough snow and rain fell on the range to keep up the supply, but the springs are ever-flowing.

At four o'clock, two hours from the ranch, we were on the summit of the north peak. The clouds were high in the west, and at times obscured the sun, and their great shadows were seen moving over the wide plain. The view of Long's Peak was very fine, for, on account of our great altitude (11,453 feet) and our proximity, we could look into the upper cañons and gorges. The tramp up Lily Mountain well repaid me, for it yielded good results in photographs of the Front Range from a new stand-point.

A friend joined us at Lamb's in the evening, and early in the morning, accompanied by Carlyle, we rode away, bound for the marvellous lake. We

followed the usual trail to the peak, to a point about 500 feet above timber-line, then bore off to the left, and, without ascending very much, reached the edge of the gorge which holds the tarn to which we were going. From the brink of this gorge several other lakes were seen resting far below us. Making the horses fast to some big rocks, we "let down," as Lamb's phrase has it, into the gorge. Descending as little as possible, we made for the water, which was hidden from view by a great dike which holds it in. We reached our goal at ten o'clock, three hours and a quarter from Lamb's. We estimated the size of the lake at a quarter of a mile long and one fifth of a mile wide. We skirted above it on the north side, and a half-hour was consumed in going the length of it. The occupation was neither climbing nor walking; it was a continual jumping from slab to bowlder. There is no beach by the lake, — only a mass of big rocks on the north and west sides. The dike on the east is solid and smooth, while on the south side a nearly vertical cliff runs down straight into the water to a great depth. Wherever there is a break in this cliff, snow fills the gullies, hangs over, and is mirrored in the water. There is no passage-way along that side. When we saw it the lake was free

from ice, with the exception of two small floating masses. The elevation is 11,000 feet.

We did not stop long at the lake, but continued on and up till we reached the base of the snow-field, only the upper edges of which are visible from any point below or from any distant mountains that I had ascended. We followed the winding ice-stream for three quarters of an hour, and were greatly surprised to find a snow-field whose whole length it would surely require an hour for a fast walker

Winding Snow-field on Long's Peak.

to surmount from base to summit. In its winding course downward, the track of the snow-slope is first directly south, then turns east. Curving again sharply toward the north, a very steep arm joins it in the bend from the south. Soon it turns to the east, and is joined by another tributary from the north. The end of the trunk is about two hundred feet above the lake. The surface of the snow was hard and granular, and gave good footing, and ascending by it was much easier than by the rocks. At the base of the precipice the barometer registered 900 feet above the lake, making the elevation 11,900 feet, or 2,371 feet below the summit of the peak. This fact, together with other observations, gave us opportunity to estimate the height of the vertical cliff above us. Commencing 300 feet below the summit, the cliff plunges straight down for at least 1,200 feet, and is only a little removed from vertical for the remaining distance of nearly 900 feet. A stone thrown from the upper edge of the precipice, if projected out but a little, would reach the snow 2,000 feet below, before finding lodgment. While we were there, debris dislodged from a point half-way up fell upon the ice with a crash. We did not linger to investigate.

At a point on the snow which we paced off as

two hundred feet wide, we placed a number of cairns, in line with two larger stone men, — one placed on the lower or moraine side, and one on the ledges or upper side, — planning a second visit in order to observe whether the ice moved at all down the mountain. There was hardly any slope at this station. We observed but one crevasse, — a small one, about a foot wide, near the precipice. Against the base of the cliff and from the sides of the mountain the ice had pulled away, and deep chasms and rifts were shown.

Again, on July 28, we visited Lamb's ranch. This time Mr. Benjamin Ives Gilman was to be my companion in a second visit to the lake, snow-field, and precipice. An evening spent before Lamb's big fireplace is always enjoyable, and that night we discussed the probabilities of our meeting with some mountain lions that had been observed near the trail the day before.

In the morning we were ready to start at 6.40 o'clock. Close examination of our fire-arms made us shiver. I carried an old double-barrelled shot-gun, and was provided with a number of charges of buckshot; but one trouble with the weapon was that, after firing it, it was necessary to use a knife blade to press back the pins that discharged the cap. This would necessitate lively work in a

close encounter with a puma, if two shots did not kill. Lamb gave Mr. Gilman his little revolver with only three cartridges in it, which was all the stock at the ranch. He reserved for himself a small jack-knife. But notwithstanding our weak armor we turned off from our route to the lake when a little above timber-line at half-past eight, and scrambled for an hour among the ledges where the "lions" had been seen; but careful search failed to reveal them, and we reasoned that they had left the mountains, as there were no fresh tracks. These beasts are very shy. Carlyle said that one crossed his claim near the corral the previous winter, but was never seen again; and that he probably "lit out" of the valley on discovering that it was inhabited by man.

Our going out of the way was repaid by the glorious view that we had of the Front Range from the ledges; but it required haste to reach the lake by noon, which we did, and later lunched far up under the precipice.

We then examined the line of cairns which were on the snow. The end cairns, which had been placed on a level with the snow, were now six feet above it, showing that the snow had sunk that amount. Mr. Gilman sighted across the line. He looked amused. "How did you get them so

straight? If you wanted to prove motion, why did you not place them in a curve?" The fact was settled; there was no motion in that ice-stream, though Lamb and I thought his remarks rather complimentary to the thoroughness of our work.

Section of Snow-field on Long's Peak.

The great amount of settling of the snow-field seemed strange to us, as there appeared to be but little surface melting; but we noted one fact which explained it in part at least. At a point where the trend of the snow crosses the gorge, and on the lower side, is a lateral moraine, the top of which is some twenty feet above the ice at its lowest mark. Upon the lower side of this mo-

raine, and about sixty feet below the top, a torrent bursts out of the rocks, which comes from under the snow of the opposite side, and has worked its channel through the debris. The stream was such a one as would come from a fire-department hose, without nozzle and half turned off. The water spurted up about a foot.

This day we spent more time about the lake, and lingered long on the dike at its exit end. Notwithstanding the grand scenery above us, one thing below received our marked attention, and that was a great lateral moraine, which, commencing but a little way below our position, ran for a long distance down into the valley, and revealed what must have been the might of the ancient glacier that carried the stones down to form it. Similar scenes are repeated on the peaks near Long's, and all tell the same story. All along the Front Range to the westward of Estes Park, snow clings as beautiful cornices, cutting the sky-line in the sierra notches; as broad shining expanses it lies in hollows at the head of the deep cañons; in the form of icebergs it floats in semi-frozen lakes; and as bands or winding ice-streams it fills grooves on the rock fronts of precipitous peaks. The hot sun and clear dry air of Colorado have nearly prevailed in the struggle against the rule

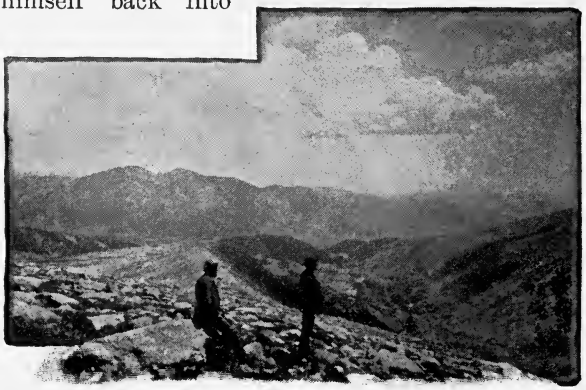
of ice, and what perpetual snows remain are but slight traces of the vast ice-fields that once covered the country. The creaking of grounded icebergs, the cracking of granulated snow, or the rumbling of waters under the rocks are but feeble mutterings in this nearly hushed and silent region of cliff and bowlder, compared with the crash of avalanche and roar of torrents that once must have reverberated among the crags and ledges.

In many parts of our continent, where rains have come in floods and all aerial forces have had full play, the tracing of past glacial action is only possible to the skilled and persevering geologist. In Colorado, however, on account of the lack of moisture and frost, many records of geological interest remain essentially unchanged by time, and we see uplifted strata near the mountain tops, banded structures of granite on the mountain sides, and morainal debris at the mountain base, the rocks remaining much as they were originally reared, compressed, or distributed. Age upon age of geologic time has passed since the ice crowded down the whole length of the gorges, and filled the narrow valleys, but the length and magnitude of the ancient glaciers are attested by the present aspect of these valleys; and though the active forces are confined to the mountain tops, their

past work in the lower country is plainly seen, — more plainly, perhaps, than in any other locality. A series of mighty rocky barriers crosses the cañon beds at frequent intervals, marking the successive stages of the retreat of the ice up through the gorges; while, sweeping away from the base of the peaks, are great lateral moraines, many hundred feet high, extending to a considerable distance. Such is the huge moraine in Willow Park. Five hundred feet in height at the base of the mountains, it runs with true tapering lines far down into Estes Park, its limits being marked by a row of straggling bowlders. The path of the ancient glacier which brought down the rocks from the mountain tops to form the ridge, has been traced high up into the range, showing that it must have been at least ten miles long, with tributaries nearly as large.

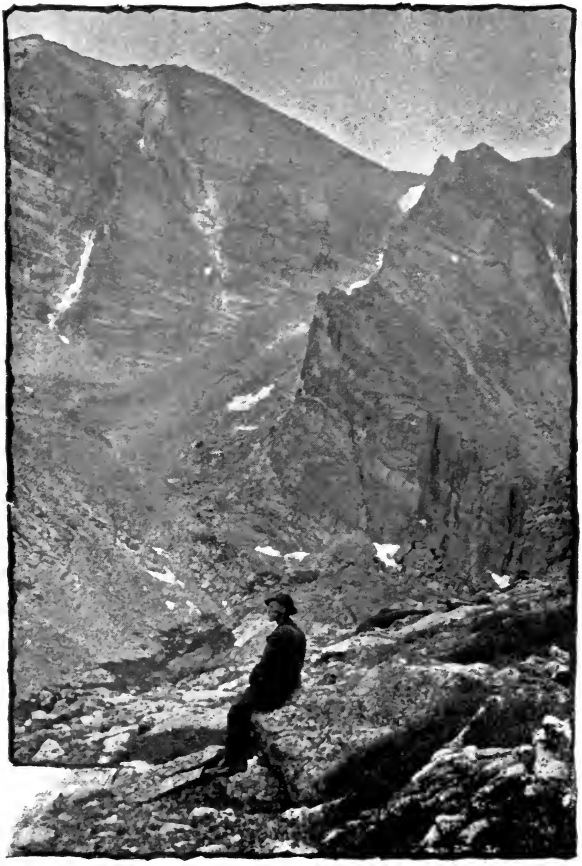
On the opposite side of Long's Peak from that which we were exploring are a number of moraines similar in appearance to the one in Willow Park, but this one that we looked upon seemed to surpass them all in interest and in pictorial effect. It begins but a little way below the lake, and sweeps with a beautiful curve far down into the valley, looking like a great artificial embankment reared by a gigantic race of men. Differing from

the ledges of the foot-hills, and from the scarped cliffs of the mountain flanks, this ridge is made up of bowlders and debris; and though overgrown on its lower portions with spruce and pine, its origin is evident to even those little versed in glacial lore. Few scenes in nature can be found like this, where the observer can so easily throw himself back into



The Great Moraine east of Long's Peak.

the geologic past. Far above is the remnant of the glacier, with its steep incline; and though our investigation proved it lacking in motion, yet with its fields of *névé* and tributary couloirs it is very glacial in appearance. Spires of rock and splintered crag tower above. The wild amphitheatre of cliffs around has been swept of debris,



Across the Gorge to Escarpment of the East Peak.

and the place of deposit of the torn fragments lies far below; for in the days of old, rocks that crumbled fell upon the moving ice-stream, which in its passage scooped out the lake bed and landed its freight in the valley.

In the distance, overlooking a beautiful valley, and past the wooded slopes of Lily Mountain, one sees the wide stretch of hazy plain, in appearance like the ocean in a calm, and can imagine himself back in the paleozoic age, when the great inland sea rolled to the westward before the mountains were uplifted and the waters retreated toward the gulf.

Surely, in resting on this dike, one dreams of a past and thinks not of the future. In descending from it this day we followed down the gorge farther than in the previous trip, in order to see some very pretty falls that tumbled over the ledges. At one point the height of the fall is seventy feet, while a little farther down stream is a second fall of a hundred feet. Standing below it the view is remarkable, for the great walls of Long's Peak are in the background.

This records my last expedition of importance on Long's Peak, and I would not fail to impress on the mind of the tourist that the scenes are too grand for words to convey a true idea of their magnificence. Let him, then, not fail to visit them.

III.

INTERESTING as the ascent of Long's Peak may be, no one expedition by any means exhausts the attractions of the mountain. Both upon its sides and at its base, removed from the beaten trails, are forests, glens, and brooks deserving of detailed exploration.

On July 4 I set out from Lamb's ranch, accompanied by Carlyle, in search of the homes of the beaver. We explored several streams to the south of the ranch in vain for new dams and occupied houses; but equipped as we were with a camera, we found plenty of amusement in investigating and photographing the ancient beaver works. On Rock Creek, which flows from the snows of Long's Peak, there are many of great interest. In the meadow through which this stream runs, an area of many acres is grown up with willows and intersected with a perfect network of old dams. The stream has been turned from its channel so many times that it zigzags in every direction. As a rule the novice would probably not detect the fact that these embankments are the work of beavers, for they are all turfed over and may be a century old. Some of them cross the meadows like causeways, others

are covered with tall rich grass; but in one place we succeeded in getting an illustration which shows plainly the origin of the artificial ramparts. The stream had broken through the old dam, and had left exposed to view the manner of its construction. In places the earth had been washed away, leaving sticks projecting both parallel and

Old Beaver Dam.

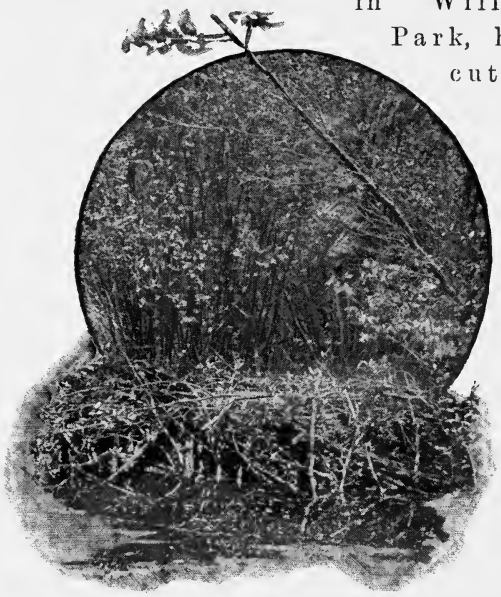
at right angles to the length of the work. The sticks and twigs were well preserved. At places on the side of the embankment these sticks and mud were solid as if stratified in alternate layers. Near this broken dam we found the skull of a buffalo.

The old houses were very interesting; many ap-

peared like heaps of branches and decayed wood. We discovered one, however, that was much more regular in its form than the new houses observed in other localities. The channel of the stream had been changed some yards from the house, trees and shrubs had fallen away, and the ancient dwelling, left on a high and dry spot, had settled into a regular conical heap. My observations in general lead me to think that the beavers do not intend to build their houses so as to be conspicuous, as often portrayed, but rather choose to have them appear as a mere heap of brush which might have collected in a natural manner.

Old Beaver House.

Another day Mr. Hallett, Mr. Gilman, and I were exploring the sources of Wind River, upon the northern slopes of Long's Peak. Within a few years Mr. Sprague, the proprietor of the ranch in Willow Park, has cut a



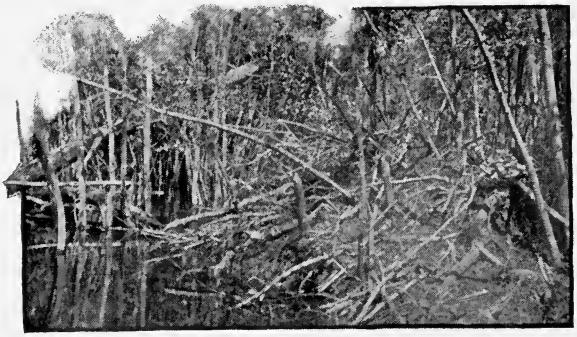
New Beaver Dam.

trail to the peak, which runs by the side of this little stream for a few miles. At a point where it was a little too deep to ford, he laid down a few aspen-trees to answer for a bridge. Our

route intersected this trail, and we made use of it for some distance; but when we came to the banks of the stream, we found its passage impossible, for a large deep pool lay immediately in the place where the trail led down to the brook. For a moment the cause of the pool was a mystery, but peering beyond we caught a glimpse of the newly made dam, and there dawned upon us the explanation of the disappearance of the lightly built bridge. To save labor the cunning beavers had made use of the cut aspens, and had worked the greater part of them into their dam. It took us over an hour to cut an opening through the woods at a place where we found a suitable ford to cross the stream, and thus flank the breastworks of the obstructionists.

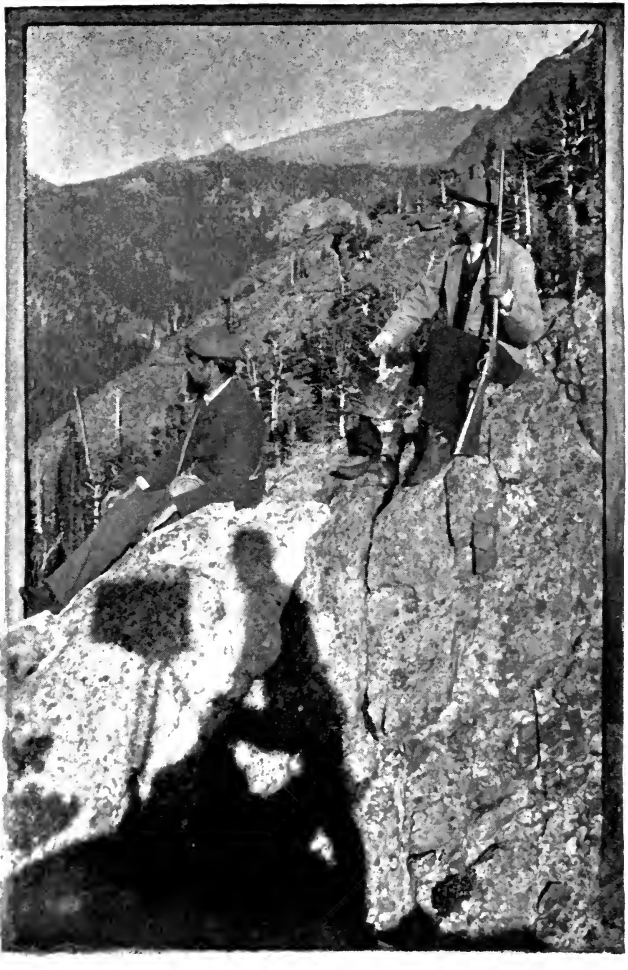
After quite a long search we discovered the recently built house, hidden among aspens and willows in such a wild spot that, without having seen the breakwater in the stream below, no one would have suspected the existence of the dwelling. Clear cool water flowed by its base. Mirrored in the pool one would hardly know where the trees and tangled brush ended. The house was placed on the edge of the stream, and some of the poles forming it projected over the water, so that the

edifice seemed to overhang. A well-worn path led from a steep bank near the log and mud house up through the forest. Large trees lately felled lay around, and had been completely stripped of their bark. From the freshly cut twigs observed, it was evident that the animals had been at work the night previous, and only a few hours before our arrival. Under a tree we found a number of



Inhabited Beaver House.

freshly cut sticks, all of the same length, — about eighteen inches, — and of a nearly uniform diameter, — one and one-half inches, — which we supposed the beavers had provided to use for dividing the interior of their house into apartments, or more probably to make an upper room. This latter work they accomplish by thrusting one end



"We three."

of the sticks into the sides of the house from the inside, the other end projecting nearly to the centre of the interior. Placed thus in a circle, an opening is left through which the animal can crawl and rest high and dry. This upper story is necessary, because the streams are liable to rise suddenly and flood the ground floor.

Dependent principally upon aspens and willows for food, the beaver is certainly hard pressed now to maintain his "claims" in Estes Park, for the pre-empters are fast taking up all the land where these trees thrive. Higher up in the cañons, the willows entirely disappear, the aspens are scarce, and there will soon be nothing for the beaver to do but to migrate beyond the range.

This day we spent so much time among the beaver works that the object of the expedition, an intended trip to the headquarters of the south fork of the Thompson, was defeated; but a prospective hard tramp was replaced by an enjoyable scramble in the afternoon among ledges on the slopes of Long's Peak; and this, with the episode of the beaver dam and the bagging of grouse, that fell to our gun, made the day one of the most delightful that I passed in the Rockies.

PRECIPICE ON MOUNT HALLETT.

CHAPTER III.

MOUNT HALLETT.

AFTER having made the ascent of Long's Peak and a number of lower elevations, I was bent on investigating the rock walls of the range that extend around to the northwest from Long's Peak to Hague's Peak, the eastern face of which in many places rivals the mural cliff of Long's Peak itself. As observed from high points in the centre of Estes Park, it is evident that there is but one pass in the chain, and that is over Table Mountain. The rest of the range is one solid rampart, — at least as far as Willow Cañon, — and impassable for pack mules.

In the northern Rockies the difficulties to be considered when attempting to cross the chain depend upon whether pack-mules and horses can be gotten over it or not; for it must be remembered that their aid is absolutely necessary for the success of any long expedition, as there is no comfortable hotel, nor even a log-cabin, to be found on the western side of the ridge. For hunting expe-

ditions the beasts have to carry blankets, flour, coffee or tea, salt, and pork; no sugar or milk is allowed. For such an expedition as is to be described, a pack animal is not generally required; but as I had a camera and plates to carry, it was necessary for me to have a horse, and to ride as far as possible. The ideal way to climb mountains is to have nothing whatever to carry, — no camera, no theodolite, no rifle, — nothing to load one down, except perhaps a cracker and a bottle of cold tea to sustain one's self during the walk. But in all my ventures during the summer of 1887 I carried my photographic apparatus to the highest ledges. Therefore I always rode a horse as far above timber-line as a route could be found for him.

The first difficulty which presents itself to the mountaineer in Colorado is a lack of guides; there is much trouble about securing them to accompany one even as far as trails go and as far as a horse can carry. The hunters object to climbing or walking; and although very familiar with the country, hunting as they do all around the peaks, it is rarely that they climb to the mountain tops. One of their number, a dweller in an upper park, told me that he did not "see anything in the high mountains, and did not know about the scenery."

"Yes," said a listener, "he don't know about anything but 'bar.'"

But our little company at Ferguson's was well provided with a leader in the person of a gentleman who has a cottage near this ranch, who spends all the summer months in the mountains and knows thoroughly every trail and stream for many miles around. To him I am indebted for all that I saw of the Front Range, excepting in my ascent of Long's Peak and of some of the lower elevations.

Peak of Mount Hallett.

The sharpest peak in the Front Range, as seen from the valley of the Big Thompson Creek,

which runs through Estes Park, is a mountain near the centre of the range, to the left of Table Mountain. It rises from the large snow-field which hangs like a true glacier to a steep ridge connecting the peak with Table Mountain. For several weeks I had looked with longing eyes at this peak and its snow surroundings, wishing to climb it in a single day from Ferguson's ranch, and to do this in connection with a ride over Table Mountain toward Middle Park. When our acknowledged leader proposed taking our little company, consisting of a member of the Appalachian Mountain Club, the surgeon, and myself, over the mill trail to the continental divide, I had no doubt that my plans would succeed.

The day fixed upon was late in August. We were to have been off at six o'clock, but it was half past six before we left the ranch. We intended to take a barometer, but our leader dropped it on the porch as we were packing, and it *fell* three thousand feet. We rode off, however, in good spirits, thinking ourselves fortunate in getting started even so early, for the horses had to be "rounded up" for us; and Tom, the mule, galloped all over the hillside before he was captured.

We rode down the hill and crossed the Big Thompson Creek, recrossed it to the Wind River

Valley, then over the Wind River and south branch of the Thompson, and followed the latter by a road leading through sage-brush until we came to a flat meadow and ranch at the base of the mountain.

We reached this ranch at about eight o'clock, then followed the rapid stream up through tall aspens to an old saw-mill. The timber is very heavy on this mountain, but the mill did not pay financially, as the lumber had to be hauled so far to market; so everything has been abandoned and has gone to ruin. We were now by the side of Timber Creek, and in twenty minutes struck the trail leading through tall spruce, and left all sound of tinkling cow-bells and lowing of cattle far below us. The wood was dark, the ground damp, and wonderful flowers and moss grew on the trail. Deep-colored Painted Cups, and the tiny fragrant bells of the *Linnæa borealis*, the white *Pyrola chlorantha*, the curious Lousewort (*Pedicularis racemosa*), and the *Arnica alpina* gleamed out of this green darkness. These flowers were carefully transferred to boxes, for the inspection of botanists down at Ferguson's, to whom also we carried several genuine alpine plants, found far up toward the mountain tops.

We found a deep snow-bank in among the trees

a little below timber-line, which is at about eleven thousand feet above sea-level on this, the north-eastern side of the range. Here we turned off from the trail to a ledge a few steps away, from which we had a wonderful view, through a deep gorge, of the rocks belonging to the peak which we intended to scale. A thousand feet below us was a large lake, which appeared dark as night and is evidently very deep, as the sides run down steep from the edges; we called it "Black Lake." A little higher up was another, from which the eye followed up the ravine, over bowlder waste and white snow coverings, to the large snow-field, which looked still more like a glacier than it did from the valley below. It is evident from the succession of moraines that a mighty ice-stream once filled the entire length of the cañon.

This scene, which has been looked upon by very few persons, is certainly alpine. Taken in conjunction with the view of the tower of Long's Peak rising in the southeast three thousand feet above the observer and exposing a grand slope with a lake nestling at its feet, few sublimer sights can be met with in the chain of the Rockies.* From the opposite side of the gorge, a vertical

* See Frontispiece.

wall rises to a height of not less than one thousand feet; the face of it nearly perpendicular, — a marvellous exhibition on a stupendous scale of the geological phenomenon of cleavage. The surface of the ridge that we stood upon is broken in masses, bowlders, and blocks, — a wilderness of debris unevenly distributed, while upon the precipice there are no signs of uneven demolition or aqueous erosion. The rocks cleave off evenly in straight up and down planes along the whole extent of the face.

After leaving the timber the trail is very indistinct, — indeed there can hardly be said to be any trail at all, a possible way for horses being marked merely by stones placed one upon another at long intervals. These were set there by our leader or some hunter, on a previous trip.

While among these rocks we shot a ptarmigan. The first warning we received of the proximity of this bird was seeing the half-grown young, about the size of quail, running around or taking flight to a distance; they were evidently able to take care of themselves. Then we discovered the old bird crouching on a rock, its wings spread out so as to lie as flat as possible, and showing a few white feathers on them. This bird is heavy, though not quite so large as the grouse, but its

power of flight is wonderful. When frightened it will rise immediately and shoot over the top of a high peak, far away. This one was only waiting for all its young to disappear by flight or hiding, before it would fly towards the western mountains. Later in the season the ptarmigan is perfectly white, approaching this condition gradually. In winter the feet are covered with white downy feathers, while in summer they are nearly bare. When disturbed in the winter they fly to the snow-fields, where it is almost impossible to distinguish their white forms.

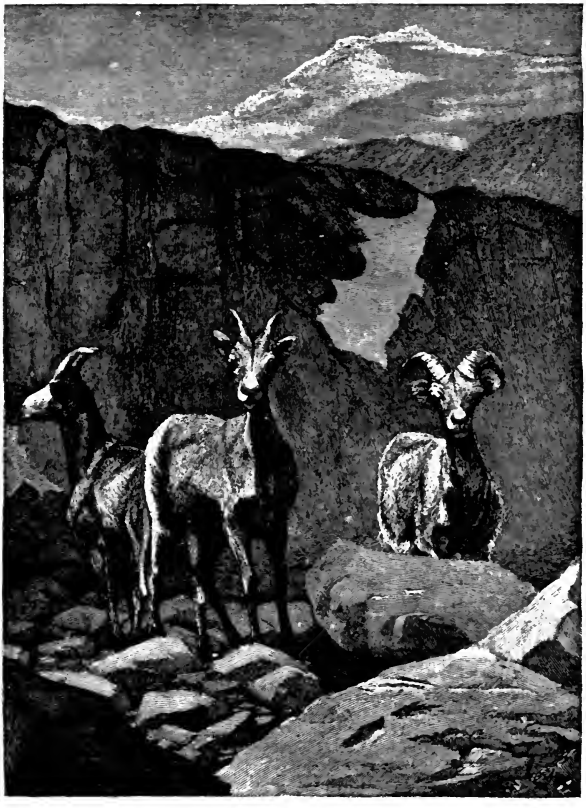
An old moraine among the rocks near where we saw the ptarmigan, was distinctly traceable for several hundred feet down the mountain, by rounded stones piled in a curving row about two feet high, reminding one of a stone-wall in the Berkshire hills.

A little farther on in the ascent we had a great surprise. We were keeping very quiet and were on the lookout for ptarmigan, when we came upon three Rocky Mountain sheep, quietly browsing only a few hundred feet distant on our right. Our leader told us to duck, and said in an undertone to me, "Follow me with your camera." I did so, and all of us dismounted and almost crawling along soon saw the big-horn again, though

they had not observed us. The wind was blowing a gale in our faces, so they had no scent of us. Luckily my instrument was focussed. I pointed the lens at the animals and exposed one plate, although they were not so near to us as when we first saw them. They now discovered us, and after a glance in our direction trotted off over the slope to the brow of the hill. It was remarkable how easily they moved over rocks and bowlders among which we could hardly find a way for our horses and mule. Imagine our surprise when they turned and walked a little way towards us again. I asked my friends to return to the packs for more plates, and while they were gone I focussed more carefully on the still distant animals, as they stared at me, their curiosity overcoming their fear. My companions now brought up the relay of fresh plates, and retired behind some ledges farther off. At this moment, as I remained there alone by the camera, the ram stood up on his hind legs and struck out with his fore-feet as if inviting combat; then the three stood looking at me. We were in one of the wildest spots on the mountains; a seemingly endless field of ledge and bowlder all around, snow mountains and rocky peaks only in the panorama; all signs of valley or glen, tree or river, far below.

I had a moment to reflect on what I was beholding, and carefully adjusting the glass again on these rare creatures, closely watched them.

Our leader crawled up towards me, and as the quarry showed signs of alarm I attempted to take another picture; but I was now so excited that I took a slide out of one plate-holder before putting the cap on, and that ruined piece of glass now lies among the rocks to amuse the conies and ptarmigan, while the slide which I had placed on the camera was whirled far away by the strong wind. Even so experienced a hunter as my companion lost his head as the big-horn were trotting away, and exclaimed, "Take them quick, take them quick!" Then, as they stopped once more and looked at us, he called himself bad names, saying, "I might have known they would stop again, and that there was no need of haste." But lo! what did these sheep do but turn around and walk deliberately toward us until they were within about a hundred feet! We were fairly trembling with excitement, and I first took off the cap without pulling the slide. When I made this blunder they were all facing us, standing on granite pedestals a little elevated above the general level, and in line with the broad snow-field on the cliffs back of them, which showed them in relief with



The Quarry.

startling clearness. But the one seen in the background in the illustration then turned; the others stepped down from their bold positions, and the best opportunity was lost. The next moment I succeeded in capturing them as seen in the picture; and then the animals decided to trot off, and we saw them no more.

Hunters talk of the excitement which a novice experiences when he shoots at his first buck, but I could have shot those three big-horn without being one half so nervous as when trying to photograph them.

Of the five plates which I used in trying to capture the big-horn on glass, three proved worthless besides the light-struck one already referred to, and it was indeed exceptional good fortune that I was enabled to secure even one picture of these very shy animals. When one reflects that hunters are obliged to use every precaution in approaching their haunts, and sometimes are obliged to lie concealed for hours, or to crawl on the edge of dizzy precipices in order to obtain a distant shot, he will realize the value of what we saw and took away with us. I certainly wish the noble ram and his little company a long and happy life among the wild crags of the great Front Range; and may the rifleman's bullet never bring low the

beautiful pair of horns carried so grandly by the leader of the quarry!

This shy, beautiful creature is fast disappearing even from the wild mountain tops, and soon traces of him may be as rare as of his former pursuer, the Indian, of whom but one not very lasting mark remains in the valley of the Big Thompson Creek.

The photograph of the big-horn naturally occupies the place of honor among a great many pictures which I took in the Rockies, most of which were secured from very high elevations. The reader will perhaps pardon a little boasting when he realizes that such luck has probably never befallen a mountaineering photographer before. European climbers have been photographing for years in the high Alps, and even in more remote regions, but I doubt if a chamois has ever sat for his likeness, for it is rarely that one is closely approached. When I gaze at my picture of the big-horn and recall their appearance on the wild apex of our continent, I think of Tyndall's description of a day on the Great Aletsch Glacier, in which he tells of watching the approach of a chamois, till through his field glass he "could see the glistening of its eyes," but "soon it made a final pause, assured itself of its error [in approaching so near],

and flew with the speed of the wind to its refuge in the mountains." Even by early travellers, the mountain sheep is described as very shy and difficult of approach. Fremont's description of his first sight of this animal is very interesting: —

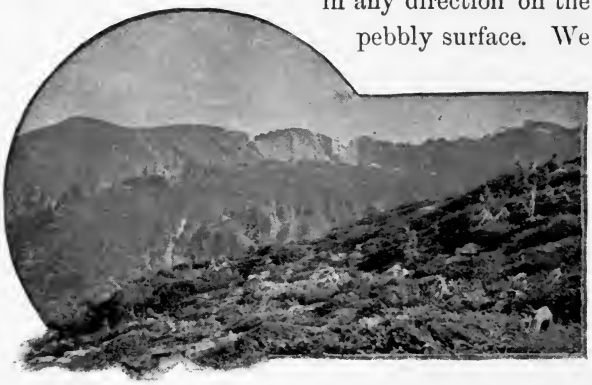
"It was on the 12th of June, 1843, that we first saw this remarkable animal. We were near the confluence of the Yellowstone River with the Missouri, when a group of them, numbering twenty-two in all, came in sight. This flock was composed of rams and ewes, with only one young one or lamb among them. They scampered up and down the hills, much in the manner of common sheep; but notwithstanding all our anxious efforts to get within gun-shot, we were unable to do so, and were obliged to content ourselves with the first sight of the Rocky Mountain ram."*

Persons who are unfamiliar with the game in the Rockies, or who have no idea of the wildness of the big-horn, I would refer to the pages of that very interesting book by Baillie-Grohman, "Camps in the Rockies," or to a paper by W. S. Rainsford in "Scribner's Magazine" for September, 1887; and after reading either or both of these accounts of the chase of the big-horn, I think they will agree that it was a marvel that

* Quadrupeds of North America, J. J. Audubon, edition of 1854, vol. ii. p. 166.

such an animal could ever be photographed among the wild crags of his native ranges.

Very soon after the adventure with the big-horn we reached the top of Table Mountain. The outlook was grand on all sides. We were out of the bowlder field, and could almost gallop our horses in any direction on the pebbly surface. We



View from Table Mountain Southward.

rode to the west end of the mountain, which we reached at one o'clock, and looked right down upon the glacier-furrowed Middle Park, and upon Grand Lake, the large sheet of water in it. This side of the mountain was broken up into ledges, not very abrupt however. The distant lines of snowy ranges were very sharp and clear in the

west, and the mountains of the Front Range around us somehow seemed higher above us than they did from the valley below. We rode back towards the peak to some water, where there was feed for the horses, and ate our lunch; but the surgeon and I made quick work of that, and left at quarter before two for our new peak, the real goal of my eyes. We rode up the western slope, which was a very gradual ascent, to the highest patch of grass, and were surprised to find how far up we had been able to ride. We then tethered the animals, and at quarter past two attacked the rocks. We could have found a more gradual but longer ascent by bearing around to the right and keeping more to the southern side; but for the interest of the ridge, and that we might have the snow and deep gorge in view, we bore to the left, up the edge, and after a short and rather easy climb reached the summit. The peak looks quite steep, but is deceptive. It is made up of a heap of rocks, and no ledges or precipices are upon any side but the north and northeast. We found a cairn on the summit, which was probably piled up years ago by some indefatigable member of the Survey party. Among the many peaks climbed in the West I found but three that I had any reason to believe had not been ascended before.

We stayed on the summit for half an hour, and studied the landscape. The view is not as extended as from Long's Peak, though nearly as fine. The great mass of Mummy Mountain, higher than our peak, hid North Park and much of the Medicine Bow Range in the northwest; but the view of Middle Park was much finer than from Long's Peak, as we were right over it. Grand Lake lay just below us. We could trace the course of the river which it feeds, winding through the deep valley on its way towards the great Colorado River and the Pacific Ocean, while on the northeast we could follow the mountain torrents that run into the Platte, and find their way to the Gulf of Mexico to be tossed about at last in the Atlantic.

The area of the summit was very limited, and a good view in every direction was obtained from any rock. Lightning had evidently lately struck on the top of the peak, for freshly broken slabs were strewn around.

We scanned the depths of the gorges below, and all the rock-strewn waste of Table Mountain, hoping to have one more glimpse of the big-horn, but they had gone to the more distant range. A wilder scene than we looked upon, they cannot find, nor better hiding-places, nor a more awful

series of cliffs to wander among than the ravines of Mount Hallett.

We ran down the peak faster than we went up, keeping yet nearer to the precipice; and when we came to the head of the snow bank, we walked out upon it, kicking in steps with our heels, until it ran off so steep that it would have been dangerous to have ventured farther without ice-axe and ropes. There were no actual crevasses, but the snow was ridged and serrated. The centre of the field seemed to be solid ice, and there was a miniature *bergschrund* next the upper rocks bordering on the ice.

Time pressed, for we had crowded much work into one day; so we hurried on, and mounting our horses, gained our friends near the opposite side of the snow. We had more trouble in finding a way down through the bowlders than in going up, but we finally sighted the trail at timber-line, emerged from the woods into the flat country at eight o'clock, and, with some "throwing in of steel," reached Ferguson's at nine o'clock.

VIEW DOWN THE GORGE BETWEEN TABLE AND HALLETT MOUNTAINS.

CHAPTER IV.

TABLE MOUNTAIN.

A YEAR'S absence from the glorious Rockies only tended to strengthen my interest in many scenes among them. Not the least important of these was the great snow-field lying in the gorge between Table Mountain and Mount Hallett, and referred to in the chapter devoted to the last-named mountain. On July 3, 1888, I was able to visit it for the purpose of making measurements to ascertain whether there might not be some appreciable motion in a body of snow of such magnitude. This and subsequent expeditions involved much hard work, though of a pleasurable nature. The results were far from satisfactory; they will be presented here, however, for what they are worth, for the benefit of any future observers who may chance to read this book.

I had been preparing for the trip for several days, and had sharpened a number of stakes to drive into the ice, so that on visiting the spot

again in August it could readily be determined whether given masses of ice had moved down the slope. Unable to find any one at Ferguson's who cared to undergo the fatigue of the ascent, I asked Carlyle Lamb to join me. He kindly consented, and not only proved exceedingly obliging and helpful, but also a very agreeable companion. He rode over to our ranch at six o'clock, and we were off at seven. Lamb carried the bundle of stakes and my sensitized plates on his horse, leaving me only the tripod and small traps to bother with. He had never been over the trail before, and I only once; but there was no trouble in finding the narrow path through the forest, which we reached in an hour.

Twelve o'clock found us on the top of Table Mountain,* and tethering the horses we shouldered our packs and descended the gorge to the base of the ice, a thousand feet below. We did considerable exploring before selecting our route, and then found that we had taken the hardest one conceivable, for we were immediately landed in a maze of tremendous bowlders, and it took us an hour to reach the lower edge of the snow. At one point, when paying particular attention to my

* Barometric observations this day gave the height of the nearly vertical cliffs of Mount Hallett as 1,100 feet.

footing, a strong gust of wind took off my hat, carried it over a high ridge and dropped it down in another cañon; so I was without headgear for the rest of the day.

The snow-field fills an amphitheatre, over a quarter of a mile in width at the lower rim, with walls a thousand feet high. The general slope is northeast. The position in width is northwest to southeast. A magnificent terminal moraine locks in the ice, and the meltings from the snow escape under the rocks of the moraine at least fifty feet below the top. The subterranean waters roared on all sides. Such a wilderness of bowlders I had never been in before. All the rocks composing the moraine have come from the cliffs above, which now show but a narrow line above the ice, except on the left, or Mount Hallett, side; this mountain still contributes bowlders and debris to the ice below. On the right side a few hundred feet of cliffs still remain, and enormous blocks had recently fallen on the ice. The greater part of the moraine was undoubtedly formed when the body of the snow was much greater than it is now, not in area, but in depth; yet I think the work of carrying down stones is still going on. At the base, on the right side, the field is divided, and the ice extends farther down than it does in

the centre. From this division a great medial moraine begins, which rivals the terminal in size, and extends a long way down the gorge.

I selected the upper edge of this medial moraine for my first stake, and crowding it into the dirt, braced it up with small stones. Lamb then went out on the ice and set the stakes at intervals, in line with a rock on the Mount Hallett side of the gorge, I giving him directions as to positions with a wave of the hand. Thus he placed eight sticks in the ice. The opposite side was very steep, and he experienced much trouble in ascending it; if the snow had not been rough, he could not have accomplished the work. In the centre, where stakes Nos. 3, 4, and 5 were set, it was slippery, and the snow had been compressed into solid ice. After the line was completed I photographed the range, the end of the moraine with stake No. 1 for the foreground, and the opposite rock in the centre of the distant view.

I then went along the line as far as No. 5, and with a hatchet hammered the posts in firmly. We measured the distance from No. 4 to the terminal moraine, where we made a cairn and found it 162 feet. Having some stakes left, we placed one seventy feet higher up the slope than No. 4, and two more above, at distances apart of

thirty-five feet; so that the highest one was in the centre of the ice-field, and 302 feet above the moraine. In order to place these stakes we were obliged to chop holes in the ice, fill in around the stakes and stamp around them, as if setting fence-posts in earth. It took us two hours to accomplish this task, and it was three o'clock before we were ready to climb up the ledges. Several routes being open to our inspection, a much easier one was found than we had used in the descent.

Again on Monday, July 16, I went up a little above timber-line on Table Mountain. From a ledge that I reached I observed that the extent of the glare ice in the centre of the snow-field had increased. The weather had been very warm, and had evidently consolidated much of the snow.

On July 25, with Mr. Gilman I started for a third visit to Table Mountain, to look after the set stakes. We carried with us two ropes, respectively twenty-three and thirty-two feet long, for the purpose of measurement. Leaving Ferguson's at six o'clock A. M., we made rapid progress, till when near the summit. Here, owing to my bad guiding, we took a course too low down on the north slopes of the mountain. Among some rough bowlders one of the horses fell and delayed us for half an hour. The animal's legs were

caught in such a manner that he seemed only able to flounder. We endeavored to get him out with the aid of the ropes, but all help seemed to make matters worse, and we gave it up. We were a pair of sad and helpless mortals. We were already talking of killing him to prevent a lingering death, when the beast managed to extricate himself, and, though badly cut, as soon as we led him to a grassy spot he began to browse in company with his mate.

An hour after this adventure we were on the snow. All of the stakes were found down, and all my labor had been expended for naught, at least so far as reliable evidence goes. One fact, however, is perhaps worth recording. Stake No. 4 was twenty-four feet below the line. One of the stakes originally put above it had moved thirty-two feet, another twenty-eight feet, which would give an average of twenty-eight feet motion in twenty-two days, or $1\frac{6}{22}$ feet per day.* These three stakes were lying in little depressions, such

* Such great motion in so small an ice-field (amounting to its total length in three years) seems improbable. However, this series of stakes was placed in the centre of the expanse, and at a point where the flow of ice from the south, the west, and the east seemed to join, the figures may be approximately correct. As the weather had been very warm the condition of the snow may have been such as would be requisite for the maximum of motion.

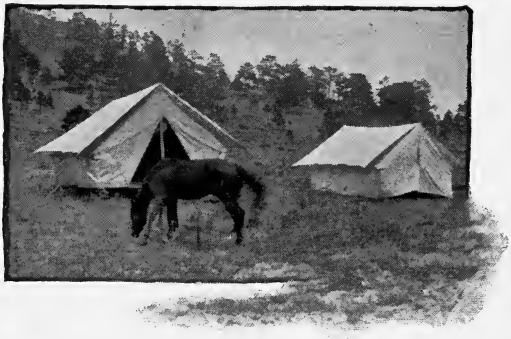
as might have resulted from our chopping on the surface of the snow. The fourth stake in the series had moved fifty-two feet, but was lying on a flat surface; so this one is left out of the calculation. How much of this motion was due to sliding of the sticks or to a real flowing of ice must remain for future observation to determine. The stakes set on the steeper portions of the ice were found on the moraine.

The surface extent of the snow-field was about the same as when we first visited it, but it had sunk about six feet, — very little, I think, by surface wasting. There was a continual rush of water under the moraine, but very little water running in rills on the ice.

On regaining the horses I took off my flannel shirt, cut off the sleeves, and bound them around "Frank's" wounded legs. We had a dismal journey home, being obliged to lead our lame horse all the way. But the accident proved a great blessing to the animal. Exempted from all work for the balance of the season, he passed the happiest summer of his existence since he was a colt. To his evident delight he could safely nibble around close to the ranch without fear of being driven into the corral to be saddled for the use of the unfeeling tourist. In short, he became a guest of the

place, and boarded at the expense of my friend and myself.

A week or two after this adventure Mr. Edmands, Professor Fay, Mr. Gilman, and I walked from Ferguson's to the summit of Table Mountain and back in a day. Though the wind on the top was something furious, the two first-named gentle-



men made the ascent of Mount Hallett in addition. Under a sheltering ledge my companion and I passed the intervening time watching cloud effects on Long's Peak in the distance, or in looking down to the scene of our labor on the snow below. The appearance of the ice was about the same as when last visited. A few more crevasses had opened high up on the northwest side. It

was interesting to compare this snow-field with others we had explored. It ranks third in size of those in the locality.

From what facts I have been able to glean from old residents in the valleys, the seasons of 1886, 1887, and 1888 seem to mark the period of minimum snow-fall. I am able to prove from photographs that there was less snow on the mountains in 1888 than in 1887. It would appear that much of the ice forming such large bodies as the mass in Table Mountain gorge must be quite old, as from reports there has not been snow-fall enough of late to make such an accumulation. I was at a loss to account for the great extent of this particular snow-field, till Mr. Hallett gave me a clew gained from his winter's residence in the mountains. It seems that Table Mountain, being flat-topped and having an immense area, is swept by the wind-storms of winter, and when other peaks are covered with snow, it is almost entirely bare. The snow is blown into the gorge, and there accumulates. While not nearly so picturesque as the winding glacier-like snows of Long's Peak, it is more interesting, as there must be three times as much ice in the gorge. The explanation of its size cannot be extended to account for that of the Hallett glacier, as there

is no such flat-top mountain near by to feed it with snow; and to explain the size of this ice-field we must take into consideration its greater altitude, and perhaps allow a larger amount of precipitation of snow. It is undoubtedly true that there is more rain-fall on the Mummy Range and in Willow Cañon than there is on Table Mountain.

In descending Table Mountain this day, we followed the edge of the gorge nearly down to timber-line. The ledges overhanging the gorge on the Table Mountain side, not far from the summit, are truly grand, and recall the words of Burroughs: "There is a fascination about ledges. Time, old as the hills and older, looks out of their scarred and weather-worn faces. The woods are of to-day, but the ledges, in comparison, are of eternity."

Lower down the rocks are firmer, and resemble the cliffs on the Mount Hallett side. Yet instead of presenting a smooth front, short cañons run into the sides of the mountain. Very steep are the beds of these gorges, and little sheets of water lie far below. Everything here is on a grand scale, and it was with reluctance that we turned our backs on Table Mountain, perhaps for the last time.

THE HALLETT GLACIER.

CHAPTER V.

MUMMY MOUNTAIN.

THE Mummy is an immense mountain in northern Colorado, lying directly north of Long's Peak and in line with the centre of Estes Park. It is a spur range running out to the eastward from a point where the Front Range, Rabbit Ear, and Medicine Bow Mountains nearly meet. It has its name from its fancied resemblance to an Egyptian mummy reclining at full length, and the range has been so called for some years. The highest point, Hague's Peak (13,832 feet, King), forms the head, and a height about two miles farther to the west marks the knees of the seeming prostrate figure.

On the north side of this west peak of Mummy Mountain is a large snow-field, of unusual interest on account of recent developments regarding its true character. It was discovered only a few years ago by a hunter named Israel Rowe, and in the following manner: It was in the time of the great grasshopper raid, when these insects

flew over the range from Utah to Colorado; myriads of them fell on the snow-fields in their passage, and many bears went up from the rocks to feed upon them. Hunters learning of this went up also to shoot the bears; and in such an expedition Rowe discovered what he called "the largest snow-field in the Rockies." Later he took two other hunters to see it. He afterward died while on a long hunt, but before his death mentioned this interesting discovery to the leader of our numerous expeditions in and about Estes Park. Four years ago Mr. Hallett visited it entirely alone, and nearly lost his life under circumstances which led him to wonder whether this snow-field might not be a glacier.

I had seen many snow-fields in the Rocky Mountains, but none where the body and weight of the snow were sufficient to form a true glacier; therefore, hearing Mr. Hallett's story, I was very anxious to have an opportunity to ascend the Mummy, and, relying on my knowledge gained in Alpine climbs, determine the nature of this one, — a desire which happily I was able to realize. At the time of my visit the great snow-field had probably never been seen by other than the persons above referred to, not only because so little had been said about it, but also on account

of the distance and the difficulty of reaching it. The expedition requires parts of three days, and few travellers have the facilities for carrying provisions and blankets so far. Our leader, however, seeing that our ambition was unflagging, offered to show the possible glacier to another member of the Appalachian Mountain Club and myself; and so, on Monday, August 1, a folding mattress, blankets, provisions, axe, and coffee-pot — in short, a complete camping-outfit — were packed on Tom, the mule, and mounting our horses at 1 P. M., and leading Tom behind us, we rode away from Ferguson's Ranch toward the Black Cañon. I carried, strapped to the back of my saddle, a camera and tripod, and a package of sensitized dry plates. It had been my intention to take some stakes also, and to run a line of them across the snow-field for future observation, but I found that it was all that I could possibly do to carry my photographic apparatus to that altitude.

Our trail led up through the cañon, under enormous cliffs on the right, than which there are few finer, though on the left or south side the steep walls are lacking. Above the cañon the trail winds to the left, high above the brook, and runs between two mountains thickly clad with spruce. It is identical with the one leading to Lawn Lake.

From there on, however, there is no trail, and even to this point there was no sign of the path's having been traversed for a year. Our leader showed great skill in guiding us among bowlders and through tangled dwarf spruce over the ridge of Mummy Mountain to a good camping-place.

In crossing the ridge east of the Mummy's head, we had gone far above timber-line, but now had dropped down several hundred feet into the black spruce on the north side, in order to get firewood. This dwarf evergreen is very peculiar. The trees are not more than shoulder high, but the trunks, in many cases, are a foot or two in thickness. We found plenty of dead wood for our fire, and after unloading we picketed our animals in good feed and had our supper. This was chiefly from cold supplies, for we cooked nothing on the trip except coffee and toast. The altitude of our camp was about eleven thousand feet. The full moon shone brightly, and the night was very clear. We could see very easily the star ϵ Lyræ as double, much plainer indeed than I ever saw it as such at sea-level. Our big blazing fire must have been seen from the plains far away. As a general rule hunters in the West do not make large fires, contradicting in this respect the Indian saying that "white man make heap big fire, git way off;

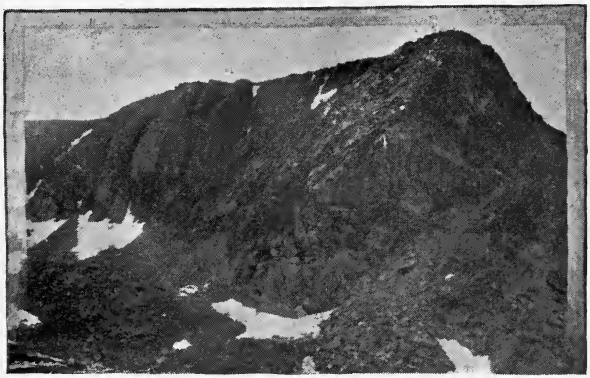
Injun make little bit fire, stay close by." The hunters do not sleep by a fire, but depend upon blankets and canvas covers for warmth.

We turned in early, slept well, and were up before the sun, that we might see it rise out of the plains. And such a sunrise as we beheld! The flat country of Larimer County is covered with artificial lakes; and as the sun came up we counted thirty-five small sheets of water glistening in its bright rays. The sky was clear, except high in the east where a mass of clouds was gorgeously colored. First picketing our animals in a new place, we then had our own breakfast. We had aimed to make an early start, but with all our expeditiousness we did not get our animals saddled and under us until seven o'clock.

We had considerable difficulty in getting through the dwarf spruce, which was very thick. The heavy snows of winter bow down the tops, leaving them one mass of tangled branches and twigs, while under the trees the footing for the horses is very rough. However, in half an hour we were out of the small timber, and riding over a smooth grassy surface by the side of a deep gorge on our right, which was surmounted by steep cliffs and a large snow-field. The gorge was a wild, desolate scene, it being the former pathway

of a glacier; down through it rocks were piled upon rocks for miles.

We reached the limits of the grass patches at nine o'clock, and could ride no farther. Leaving the horses, we walked up the rather steep ascent,



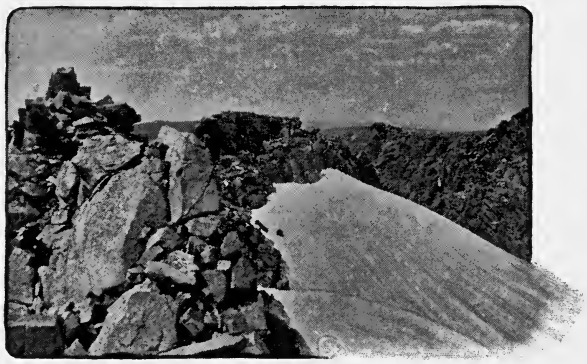
Ancient Bed of Hallett Glacier.

arriving at the foot of the snow-field in an hour. We had seen the upper snows for two hours, but had no view of the whole mass until we were right upon it; for an immense rocky ridge heaped high around the base hides three quarters of the snow-field until it is surmounted. All at once this scene burst upon us. A steep snow-bank extended about a thousand feet above to the top of

the mountain. The water which had collected at its base had been frozen again,— not solidly, but with occasional open spaces in which large blocks of ice were floating around. As the force of the wind moved them, they were lifted up by rocks or firmer ice from beneath, creaking and groaning; then broken up into fragments, but only to form new floes. The long line of the lower edge of the ice and snow curled over in beautiful combings as it hung over the open water.

The snow expanse is about a quarter of a mile in width, and entirely fills a kind of amphitheatre made by the main range of the Mummy and a spur which extends around to the northeast. In some places it makes the sky-line, but for the most part pointed rocks and towers jut up from the snow. One shaft, which we judged twenty feet in height, could not have been more than twelve inches in diameter at the base, and was of pure white quartz. The more easily decomposed granite had fallen away, leaving this firmer vein of rock standing alone. The whole extent of the snow was covered with grooves, markings, and cracks; a large crevasse began near the south end and extended a long way into the centre, and close examination revealed many more above and below it, running parallel with it. The longest

of these was about a hundred feet above the water at the southern extremity. Our leader said that when he visited the place four years before there were larger icebergs in the water. It is evident how these were formed ; for when the large crevasses, near the water, are crowded toward the lake, the masses of ice must fall off into it, repeat-



Ledges above the Hallett Glacier.

ing on a small scale what happens when the ice-masses fall from the Humboldt Glacier into the Arctic Ocean.

A single glance at the series of crevasses was enough to convince me that we looked upon a glacier, and further examination of the ice confirmed the first impression. The great ridge upon

which we stood was evidently a terminal moraine formed by the glacier in past ages. What debris comes down with the ice at the present time must fall into the lake. The surface of the glacier, however, is remarkably free from stones and bowlders, caused, as we afterward determined, by the fact that the loosened masses above the ice fall to the west down the much steeper rock-fall of the mountain; yet at one point the ledges are breaking away toward the glacier, and a few bowlders are already embedded in the ice and are on their way down the slide.

Having taken two pictures of the glacier and lake from the moraine, accompanied by our leader, I carried the camera back from the ice and took a more distant view; meanwhile the Appalachian had strolled along to the south end to look at the big crevasse. It seemed desirable to secure three negatives of this section of the ice; but as we had only one sensitized plate with us, I started back to the foot of the glacier, where we had left the lunch and other luggage, for another plate-holder containing two plates. And now an episode occurred which for the time being quite eclipsed the pleasurable excitement of our discovery with one of a more thrilling, if less agreeable sort. I had gone about half-way when my companion

called out, "A bear! a bear! come here quick!" I turned, ran back, and saw an immense range grizzly standing on a rock about two hundred feet from us; he had just come out from behind a huge bowlder. I took his picture as quickly as possible. This was probably the first time that "old Ephraim" had ever had his picture taken in his own haunts; and if he could only have known what was required of him, he might just as well have *sat* for it. I then saw the Appalachian, standing very near to the bear, but back of him, looking at him through his field-glass as coolly as could be. The bear was of tremendous size, and must have weighed a thousand pounds. His color was for the most part brown, but his back and the top of his head appeared nearly white. He was of the species called by the hunters "silver-tipped grizzly;" and as the sun was shining very brightly directly upon his back, the reflection was such as to give it a silvery-white appearance. He was evidently trying to make up his mind whether

to come down to us and take his lunch, or betake himself off up the mountain, — or, as the local phrase has it, "pull his freight." I had not thought of the bear's attacking us, though I had wondered at the Appalachian's coolness, but now the beast was growling and snapping. Suddenly my companion suggested, "Suppose he should decide to come and take us." Then I proposed that I go for the other plates, and that he get his shot-gun, our only weapon, at the same time, and load it with buckshot. "That would not be of much use," he answered; "but we can do one thing. Here, take this knife!" and he drew a large butcher-knife from his belt and handed it to me. "If he turns on us, I will wait till his nose touches the muzzle of the gun before I let him have it, and you must do the best you can for yourself with the knife; this will be our only salvation, but it will take lots of nerve to await the proper moment to shoot." Our motions were so lively that when we got back to our position by the camera, the bear had decided to move off, and was soon out of sight behind a ridge, giving a sort of snort as he turned away. Our fear was now that he would run down the mountain to where the horses and mule were tethered and stampede them. If the animals should get a sight

of the bear, they would break their legs or necks in trying to escape. This catastrophe must be averted at all hazards, for without the pack mule we could never carry the camera and plates back to camp before nightfall, and a night at this elevation, without blankets, would be horrible. We started at a brisk run over the rocks, hoping to head him off. But he travelled so rapidly that before we saw him again he had covered a great distance in a circle around us, and was about three hundred feet below our position, crossing a large snow-field, and luckily headed away from the horses. He stopped, turned, and looked at us. Standing out on the white snow-field, with steep ledges and jagged cliffs rising high in the background, his figure was certainly very picturesque. It was impossible to photograph him, as he was so far below us ; so my companion asked, —

"Shall I give him a shot ?"

" Pepper him," I responded.

" He may turn on us."

" Pepper him," I said again.

Bang went the gun, and the beast jumped. Bang ! another charge of buckshot followed, and the bear gave another leap forward, although the effect of the shot was probably no more upon him than the cut of a whip would have been if given

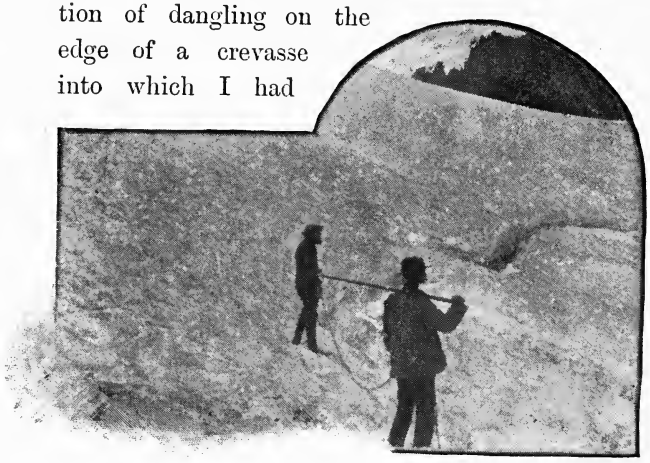
CREVASSE ON THE HALLETT GLACIER.

near at hand. However, the shot so accelerated his gait that he probably reached Wyoming in a very short time, for he went up the side of the mountain on a run, and was over the top of the ridge and out of sight in ten minutes. I watched him for a moment on the ground glass of the camera, and his figure looked like that of a rat running up a wall. This quickness of motion in a beast of such bulk was marvellous; for later in the day it took us over an hour to gain an equal height, climbing over similar rocks. One can judge how utterly powerless we should have been if the conditions had been reversed and we had been chased by the bear.

The bear being disposed of, we returned to the glacier and roped ourselves together for an investigation of the surface of the ice, using a forty-foot lariat for the purpose, so that we had about twenty feet of rope between us. Then we crossed the snow to the big crevasse. This was fifteen feet wide in some places, and twenty to thirty feet deep, and large icicles hung down from the upper edges. After securing photographs of this, we went back to the rocks, where the Appalachian threw off the rope and separated himself from us to climb the final peak by the ledges. Our leader and I tied ourselves

together again, and began the ascent to the ridge by the glacier.

In Switzerland I had been guided over many glaciers, and on one occasion had had the sensation of dangling on the edge of a crevasse into which I had



fallen; but never before had I led in crossing a large snow-field, or assumed any responsibility. The crossing of this glacier looked easy and simple, and one not accustomed to ice-work would have probably laughed at the idea of using a rope; but my experience told me that the crevasse, which seemed to end abruptly, probably extended under the smooth snow for a long distance, and we might strike it or some other cleft

in the ice in any part of the glacier that we might cross. And then there was our leader's former adventure, to which I have already alluded. He was all alone, and ascending on the north side, trying to reach the curious shafts which stand as sentinels over that part of the ice. He was getting along all right, when, suddenly, he broke through the bridge of a hidden crevasse. Luckily the ice was firm at the rim on both sides, so that he held up by his elbows and managed to extricate himself. Safely out, he ran down the mountain, determined never to venture on the snow again without help.

We had no ice-axe. The snow was in the condition of *névé*, and very firm. I used my camera tripod for a feeler, and often could send it down deep in treacherous places; but we kept to a sort of *arête*, and by stamping foot-holes made some progress. It was very slow, however, as every step must be made, and the incline grew steeper as we advanced. If the snow had been in a more icy condition, we could never have reached the ledges without an axe, and as it was we had to make detours to avoid glare ice. From the summit of the *arête* we jumped over a suspicious bit of ice to the rocks, and congratulated ourselves that we were the first to tread upon these upper

snows.* The ledges we found very narrow and broken up into towers and spires. The west side of the peak was an indescribably wild scene, such as I had never beheld; there were precipices and gorges, masses of rock and bowlders, smooth cliffs, rough-hewn towers, and below us several thousand feet was a gem of a mountain park, with a silver stream winding through it for miles down to the Poudre. Encircling the whole were snow-clad mountains of the Rabbit Ear and Medicine Bow Ranges, and beyond was the Park Range, filling the western horizon with its mountains piled upon mountains. Part of the wonder and delight of the scene was caused by the fact that we were looking upon an almost unknown land as we gazed into the west. The meadows at our feet, walled in by high mountains, are very difficult to get into with pack animals; hence over and among the far mountains there is not a settlement until Utah is reached.

Unlike some of the difficult Swiss peaks, there

* After our return to Estes Park, our party spoke of the glacier as the "Mummy Glacier;" but now I am disposed, with Professor Stone of the College of Colorado, who visited it later in the season, to call it "Hallett Glacier." "Mount Hallett" has its name from the same gentleman, having been so christened by Dr. E. O. Otis, of Boston, and the writer, when on its summit in July, 1887.

is always some easy way of access to the high crests of the Rocky Mountains; but there is hard climbing to be found, if that is sought. To any mountaineer in search of such work, I would suggest that he ascend the Mummy glacier by an *arête* on the north side to the point where the shafts of rock are standing, then descend the mountain to the deep glen below, being careful to take provisions for two days from camp. After exploring the valley at its upper limit, let him ascend the west peak of the Mummy from that side directly to the summit, and I fancy he will have need of steadiness of head and strength of limb.

We began to make the remainder of the climb of the peak by the broken ledges, and found our way difficult. The rocks, broken and shattered, afforded poor hold, and if once they gave way, went spinning to the lake below with a whir and a crash that made us realize what would be the result should we fall from these heights. We had to help each other with boosts and pulls; for sometimes there were no firm rocks within reach, as we felt for them over the edges of platforms above us. It was not easy to get the gun and camera up; so finally, after passing the edge of the ice, which was too treacherous to venture

upon at this point, we were forced to take the face of the mountain, by which we had an easy route to the summit.

The rocks on the top of the Mummy have an entirely different appearance from those of any other summit in the Rocky Mountains on which I have stood. On Pike's Peak, Bald Mountain, Long's Peak, Table Mountain, and on many of the lesser peaks, the slabs of granite are strewn around or heaped up in piles, while here there is little debris, for the rocks are arranged in laminæ with edges up, and present a saw-like appearance; the mountain drops off on all sides, excepting the ridge to the northwest, in noble ledges flanked by massive towers.

We were more than an hour upon the summit; the atmosphere was of rare transparency, and the view seemed limitless. Mountain ranges far into Wyoming were clearly seen; Pike's Peak rose in the south, and peaks farther away to the southwest; but here, as from the ledges below, the chief joy was in looking toward the sierras of the west. This was the only peak upon which we had not found a cairn, and I doubt if it had ever been climbed before.

As we were ascending the glacier a Rocky Mountain eagle swooped down over the ridge, but

seeing us he soared up over the top of our peak, and while we were on the summit, was circling over us at a great height, probably at an elevation of 20,000 feet above sea-level. It would be a curious fact to learn at how great an elevation a bird of that size and weight could sustain itself

by flight; for notwithstanding its lightness as compared with its size, it seems as if it would drop like a piece of cotton in an exhausted tube.

It was four o'clock when we left the summit, and ran down the face of the peak to where we had left our traps and extra plates. Collecting

these, we walked to the north side of the glacier and climbed about half-way up. Part of the south side of the glacier is in shadow early in the afternoon, and on that account is very smooth and firm, while the north end is exposed to the sun's rays from early morning till much later in the afternoon; consequently, the heat has so melted the upper snows that the water runs down and causes the deep grooves seen in Plate VI. The surface of all the large ice-fields about Estes Park presents this grooved, or ribbed, structure.* While we had been examining the formation and shape of the curious ridges of snow, the sun had been obscured by high drifting clouds. Suddenly it came out with dazzling brightness, and we beheld a remarkable shadow profile cast upon the

* Since writing the above, my attention has been called to a description of the surface of the snow of the Mount Lyell Glacier, in California, which proves that running water is not the first cause in forming the troughs. In the case of the great ice-field, however, the grooves are "in a direction at right angles to the slope." According to Mr. J. T. Gardiner, formerly of the Geological Survey, "the transverse ridges or blades are produced by the *action of sun on wind ripples.* During the winter the wind blows mainly down the cañon, and the loose snow is drifted into wind ripples; during the summer, when neither rain nor snow falls for many months, the snow is greatly wasted, but more in the troughs than on the crests, on account of the reverberation of heat within the troughs." — Prof. Joseph LeConte, *American Journal of Science and Arts,* 1873, vol. v., 3d series.

pure white snow by the sculptured rocks. At first it was a startling apparition, and we stood there transfixed with awe as we gazed upon it, shading our eyes with our hands. The length of the profile traced on the snow by the varying shadow was fully a hundred feet. The lines were clearly defined. Of course it can only be seen at a certain hour on sunny afternoons. The day is far distant when throngs of tourists will stream up the gorge to see the largest ice-field of Colorado, and by that time perhaps the granite rocks will have crumbled away, worn by rain and cracked by frost, and the profile which we saw will have vanished. Meanwhile many will doubtless be glad that we succeeded in securing a photograph of the strange and beautiful scene.

It was now five o'clock. We reluctantly turned away from the glacier, and scrambling over the moraine to the large snow-field where the bear had crossed, we glissaded down for several hundred feet, then took to the rocks, and soon reached our horses and mule. On the way down, we shot seven ptarmigans. We reached camp at dark in a very tired condition, but a cup of strong coffee so revived us that in an hour we were contentedly lying before the blaze, the thick hedge of spruce timber at our backs keeping off the strong blasts

of wind. Then we told stories of bear, and stories of elk, and stories of "big-horn," and smoked the pipe of peace.

Spruce firewood will always crack and snap; and this night the sparks rose high, carried far up by the wild wind, and then whisked down the deep gulch toward the plains. As I lay there looking at the black line of cliffs surrounding us, and then into the dancing flames, I thought of camp-fires long since burned out, of blazing pines in dark forests, of nights in deserted log-cabins in the West or in the stone-roofed *châlet* in the far-away Alps. Then from the heights and distance came memories of moraine, crevasse, and *bergschrund*, of expanse of snow, of bowlder waste and the wary "big-horn," of spires of rock and domes of ice, and, loosing my hold on consciousness in this strange chaos, I slipped beneath the canvas and was soon asleep.

YPSILON PEAK FROM DEER MOUNTAIN.

CHAPTER VI.

YPSILON PEAK.

THOUGH making many climbs among the higher peaks and giving much study and investigation to the upper snows, not all of the time of two joyous summers in Estes Park was spent on the mountain-tops, but many days were whiled away in rides, drives, and strolls among the quiet scenes of this beautiful vale. Encircling the shores of Mary's Lake and tracing from afar routes which we had followed into the range, was a delight. We climbed the ledges of little Prospect Mountain, and studied the topography of the valleys at our feet or of the rugged mountains in the west. We galloped over pastures; we forded river and creek. Seemingly inexhaustible are the scenes of pleasure to be found along this beautiful river of Estes Park in its short yet varied course through the mountains. Dashing forth from a dark, deep cañon, tumbling over precipices and ledges, the stream ceases for a space in its hurry, winds gently through the peaceful valley, then

again descends as a rapid through ravines in the foot-hills, and afterward sluggishly creeps across the plains to join the Platte. In one of its little glens we were shown the last memento of Indian life existing in the valley, — a "wickyup," or arbor-wigwam, hidden in the dense aspen growth, and built of these trees. It had stood there longer

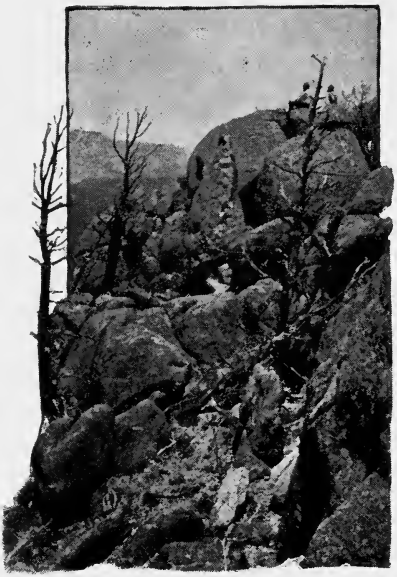
than the oldest settler knew; the poles were rotting and falling in, and could have retained their position but a little while longer; but alas! a fire has since swept through the aspen forest, and the "wickyup" has been destroyed before its time. Still more interesting and novel are the scenes to be met with, or perhaps rather to be ferreted out,

along the banks of the little torrents that flow into the Big Thompson from the north and from the south. One of these streams is Wind River, beautiful to me from many associations. It was on one of those happy days upon its borders that my great interest began in the mountain that I am about to describe.

That day I was in this pretty valley with my wife. We had spent the time lazily near a deserted cabin by the stream. I had been fishing a little. Later we were looking at the mountains, which from here are so beautiful in the west. One great peak with a steep wall facing the east, and a long reclining ridge leading toward the southwest, especially interested us. A large snow-field lay on the eastern face; two glittering bands of ice extended skyward to the ridge of the mountain, forming a perfect Y. My wife said to me, "Its name shall be Ypsilon Peak." So it went forth, and the name was accepted by the dwellers in the valley and by the visitors at the ranches.

I have already described the views from two little mountains, Sheep and Prospect, which are in Estes Park, and separated from the main range by valleys and meadows. There is another elevation, nearer to some of the great peaks, which is well worthy of description, especially in connection

with Ypsilon. This is Deer Mountain, a beautiful wooded elevation, with long sweeps of pasture-land reaching from the pine growth down to the rushing Big Thompson River. Beaver Park is on the southern flanks, and separates it from Eagle Cliff. On the north a narrow valley divides it from the southern ridge of the Black Cañon; and this narrow valley leads into a wide "open" called Horseshoe Park, which lies between Deer Mountain and the range. Deer Mountain, itself beautiful to look upon, gives charming views of the mountains and valleys. One must traverse its summit, a great square nearly a half-mile



Gazing at Ypsilon from Deer Mountain.

broad, from one end to the other in order to obtain the different views; but each corner is marked by an elevated ledge, from whose summit the perfect outlooks are obtained. It was from one of these ledges, the westernmost, and overlooking that unique valley, Horseshoe Park, that I obtained the finest view of Ypsilon.

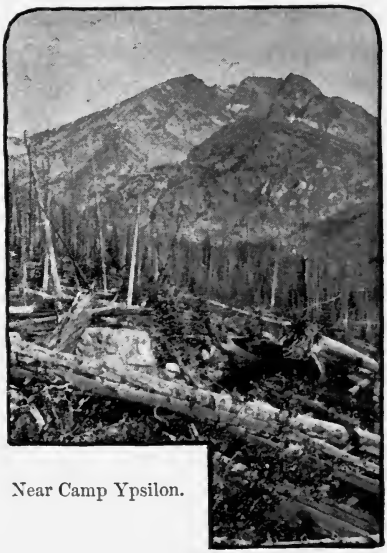
The larger parks of Colorado, such as Estes, are beautiful; but these smaller ones found higher up among the mountains are far more interesting and picturesque. Met with in among the fastnesses of the hills, they can never fail to be a surprise to the traveller, the hunter, or the explorer. They are hidden between steep ridges, which are clothed with dense spruce or pine to their base. In the glade the trees are scattered, as if planted for a park with broad walks between. The water flowing through is no longer a dashing torrent, but a quiet stream, its banks lined with aspens which quiver and rustle in the breeze. Sometimes the narrow glen widens into a vast level stretch, with high peaks walling in the distance and looking down upon fair meadows. Such a valley is Horseshoe Park, and Ypsilon and its rocky spurs block the western sky. The smaller glades found about timber-line on Ypsilon and Hague's Peaks are even more picturesque. This is especially true of

those found on the densely wooded slopes of the latter peak, which upon the opposite side is a bare rock and snow waste down to a much lower altitude. In following the ill-defined trail from Estes Park to Lawn Lake, along the slopes of the great peak, struggling up through the forest, the traveller suddenly comes upon such glades at frequent intervals, and it seems as if a deer or elk must surely bound out of the tall luxurious grass into the dark forest.

Never anxious to send me away from her side into the mountains, the sponsor of Ypsilon was always desirous that I should ascend this peak; but the summer vacation of 1887 passed away, and it still remained unclimbed. During this last summer, however, the not difficult but very interesting feat was accomplished.

Thursday, August 9, a camping outfit was packed in Ferguson's stage; and our party, consisting of Mr. Hallett, Mr. Gilman, Mr. George W. Thacher, Mr. J. R. Edmands, Prof. C. E. Fay, and the writer, started for Horseshoe Park to attempt Ypsilon Peak. Mr. Gilman and myself rode horses, which were to be used as pack animals on our arrival in Horseshoe Park. We left Ferguson's ranch at 9.30 A. M., and reached the end of the road at 11.30. There we unloaded

the wagon and sent it home, packed the two horses with the necessary outfit, and turning to the right followed an old trail by the side of a creek which flows from Lawn Lake. We lunched in a park where there was feed for the horses, and higher up at four o'clock forded the creek under some difficulties, the operation consuming half an hour. After leaving the ford, there was no trail; so Mr. Hallett led the procession with axe in hand, and was obliged to cut and hew right and left.



Near Camp Ypsilon.

With our faces now turned directly toward Ypsilon Peak, and several hundred feet above a brook which flows from its snows, we worked our way over the side of a great ancient moraine for

three hours, and on the banks of the stream found a suitable camping-spot at dark. I acted as commissary and cook, but fear that my comrades were not over and above pleased with the very plain fare. We passed the night under cover of canvas, rubber, and blankets; we did not carry a tent. With the exception of one of our number, we all slept well.

In the morning we left camp at 7.20, — at first in a body, but, as is generally the case with such a large party, we were soon scattered all over the flanks of Mount Fairchild, over the top of which we intended to go. Mr. Hallett carried my sensitized plates, — a heavy load. I lugged the camera, and in addition to this burden was troubled with a very lame foot, and had little hope of standing on the summit of Ypsilon that day. Mr. Edmands soon made direct for the summit of Fairchild, which he reached at 10.55; while the rest of us bore to the right in order to gain a ridge, by following which we thought we should obtain good views the whole morning long. We kept nearly together, Messrs. Fay and Hallett arriving first on the ridge at 8.15. At that point I took pictures of Ypsilon, and higher up obtained fine views of Hague's Peak and the west peak of the Mummy Range. The deeply furrowed precipitous sides of

the former peak, rising nearly three thousand feet above the timber, were marvellous to behold.

Messrs. Fay, Hallett, and Thacher now went ahead for Fairchild; and Mr. Gilman and I, not being in good condition, determined to skirt that mountain a few hundred feet below the summit. We were soon joined by Mr. Thacher, who was also out of sorts and had given up Fairchild. Luckily we had one canteen of milk and a flask of brandy with us, and constituted ourselves an invalid corps for a short time, when, strange to relate, my lame foot with exercise had become entirely well. Mr. Gilman also had quite recovered from his indisposition; so, leaving our friend to continue a direct high-level route to the notch between Fairchild and Ypsilon, we made straight for the top of the former, over the steepest part of the peak. This enabled me to examine a snow-field in which I had long been interested; but I was disappointed in it. When I came to Estes Park, the first of July, it was a great body of snow, and so shows in photographs taken during that month; but it had steadily decreased, and now, a perfect arrowhead in form and at its minimum in size, the ice was very thin and shallow. At the snow we again changed our plans, thinking that we should be too late to meet our

friends on the summit, and bore away around the peak, hoping to head them off. We crossed their path a hundred feet above them, and arrived on the scene at an opportune moment. We had commenced to descend at a rapid gait, when Mr. Gilman shouted, "Look! a bear!" He spied the animal, a great cinnamon, as it was emerging from its lair under a projecting ledge. I shouted to Mr. Hallett, who carried a revolver; and he gave Bruin several shots, all but one of which sounded "click" against the rocks. The bullet that returned no sound we suppose lodged in bear meat. Like the grizzly which we met last year on Mummy Mountain, this bear seemed bound for Wyoming, and soon disappeared beyond the skyline of the mountain; but he gave us lots of fun for a few minutes.

We reached the notch at 12.50 P. M., and there joining Mr. Edmands we began on the lunch. Mr. Thacher soon came in, and reported having seen two young cinnamon bears playing on ledges below him. The bear question was getting serious.

At 1.30 P. M. Messrs. Edmands, Hallett, and Fay started for Ypsilon's crest, which they reached at 2.25. Mr. Thacher started down through a gorge for camp, which I considered a very heroic action; for my part I never should have ventured

through that country alone and unarmed. Mr. Gilman and I spent some time selecting view-points and taking photographs, using up most of the plates. The views from the notch are very fine, especially toward the west. Starting for Ypsilon at two o'clock, we followed the route taken by the others, which led up the gradual western slope of the mountain, and reached the summit at 3.10. We found the topographer busy taking angles; but all his labor was for naught, on account of the disturbance caused by the presence of magnetic iron in the rocks. Although the day was perfect for an expedition in the mountains, the breeze was a little too fresh on the highest rocks; so we all dropped down under a ledge on the east face, and scanned with the field-glass the gorges below.

Ypsilon from above is even finer than from below. The snow gullies which form the long lines converging together at the base, which give the peak its name, cut deep into the mountain's flanks, and have formed miniature cañons. Weird shapes of snow cling to nooks which are sheltered from the sun. One cornice had a big hole in it, as if a cannon-ball had passed through. But the great point of interest is the steep character of the whole northeastern face. Numerous lakes were

visible below, between us and our camp; some were perched on high moraines far away from the base of the peak; while straight down and over two thousand feet below, immediately at the base of the cliffs, we saw two large ones which were walled in by dikes. All the great peaks in the neighborhood have these characteristic glacial lakelets. The debris seems to have been swept away from the exit end, though great blocks lie on the side.

In a short time we went to the point near where the left snow couloir begins, and hurled off big bowlders, imagining that we could send them into the water below. Only one thing prevented: we could not find any rocks tenacious enough to hold together. All were reduced to fragments before they reached the smooth surface of the lake.

The three who first arrived on the summit soon left us, and following the ridge descended the next peak south on their way to camp. After parting with these companions we returned to the summit of Ypsilon and commenced to erect a cairn, but the rocks being too heavy to handle easily, we gave it up. As the wind had died down a little, we spread out a map on the rocks, and with aid of compass identified many points of

interest; but soon abandoned that simply to take in the glorious view. Long's Peak with its grand tower never looked nobler. The mountains in Estes Park were but his little foot-hills. The moraine in Willow Park, the smaller ones in Horseshoe, and the still larger one, which above our camp led down towards Horseshoe Park, were very prominent features in the near landscape. The imposing rocky face of Hague's Peak cut off the northern horizon. Past the turrets of the west peak of the Mummy Range we saw the ice of the summit of Hallett Glacier. Then for the first time I realized why that great mass of snow exceeded all others in the Front Range. Placed near the summit of a peak 14,000 feet in height, it lies in such a cold region that this alone prevents little waste from melting.

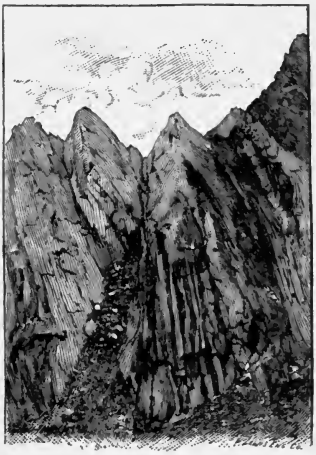
The view toward the west is magnificent. It must be remembered that this district is yet in a wild state. Let not the reader think when he looks at the map and sees places noted, such as "Lulu," "Michigan City," that it means much. In many cases such dots mark but the site of deserted mining-camps or lonely ranches. "Moraine," for example, in Estes Park, given place on the map in large letters, is in reality one ranch, Sprague's, with a few cottages for summer visitors.

Perhaps two or three members of the family at the most remain at the ranch during the winter months. Grand County, whose mountains we gazed upon, contains some 2,000 square miles, and had at the last census a population of 417 persons. These mostly dwell in the lower part of Middle Park; so it may be imagined that very few human beings were in the wide country that we looked upon. Right beneath, a deep upper valley of the Cache la Poudre River separated us from the beautiful rock peak represented in Plate IX. This mountain, like innumerable others dominated over by Upper Grand Valley Peak, was a study in itself. The tapering summit, the white snow-field, the glacial lakelet, were beautiful. What an ice-fall and what a crevasse must once have marked the place where one sees the sudden break in the gradual slopes below the lake! There were scenes such as the camera cannot carry away from mountains like these. Far below in the green valley were dashing brooks, roaring cascades, miles of green meadow and great forest, such as the dwellers on the plains little dream grow in Colorado.

All these things were seen in a few moments, and we began a rapid descent. In half an hour we reached the point near the col where we left

UNNAMED MOUNTAIN WEST OF YPSILON PEAK.

the camera, and hastened down the gorge. Of the three routes to camp followed by our divided party, we suspect that we took the most interesting. Surely there are no finer turrets and pinnacles to be found among the mountains than those which surmount the *arêtes* of Ypsilon on the north. We lingered to take some photographs, but when on the col a gust of wind had struck the camera, and throwing it over had broken the ground glass; so the pictures taken later did not prove to be quite in focus. The accompanying cut represents the sharply serrated portion of a narrow ridge which descends from the shoulder seen in Plate VIII. on the right of the highest peak of Ypsilon. The heavy mass of snow below the junction of the two arms of the Y, fairly indicated in the plate, lies in a gulch of which this ridge forms the right or northerly wall.



As we descended lower we came upon other beautiful lakes and extensive greenswards. The cliffs above us echoed back many a shout which we sent up among them, for we thought that perhaps our companion of the morning might be waiting for us among some of the ledges. Our way was free from great difficulties until near camp and at dark, when we became involved in the mysteries and miseries of a forest swamp. We divided loads and changed packs; but it seemed to me, whichever I carried, camera or plates, that they were never so heavy before. We got to camp at 7.45 o'clock, and were the last in. Camp-fire that night was an interesting one, as each had a story to tell.

It seems that our leader, by an accident and misunderstanding, became separated from his companions, and getting lower down in the gorges arrived first at camp. The professor, descending a little in front of the topographer at the upper edge of the scrub growth, was very much startled by two large cinnamon bears, which at full speed, and growling, advanced upon him in tandem order. He shouted loudly, and whirled his shining canteen in the air with sufficient energy to change the plans of Bruin, who had probably considered him some small game. The one in

advance, now within twenty feet, turned so quickly in his tracks that he almost knocked over Ursa Minor, following at his heels. Their appearance was for a moment ludicrous, and tended to neutralize the sensation of fright which the beasts had at first excited. Mr. Edmands hurried to the scene, of which the two gentlemen remained masters; for the animals, after getting themselves together, disappeared into the timber.

Our camp was also a merry one; we knew no sadness. We had been upon a beautiful mountain, had met with adventures and no mishaps, and were now safe around a blazing fire within the circle of whose rays neither bear nor mountain lion would dare to venture.

CHAPTER VII.

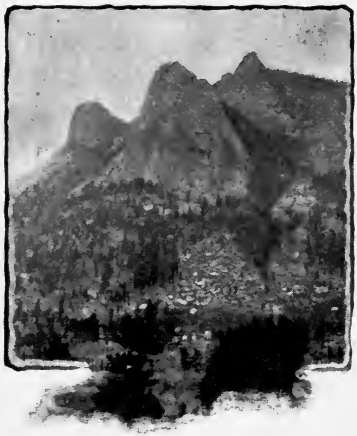
HAGUE'S PEAK.

OUR party for a grand trip to the Hallett Glacier, returning over Hague's Peak, consisted of four persons, all of whom were connected with the expedition to Ypsilon. It was a question whether we should camp at Horseshoe Park or in the Black Cañon, but at last we chose the latter. We decided to take a wagon as far as possible, and so carry a tent. We also made up our minds to dispense with pack animals, and make a long day of it.

We left Ferguson's at two o'clock P. M., August 14, reached the end of the wagon-road on the south bank of the stream at a quarter before four, and getting our traps across the river pitched our fly-tent under some pines. While the others were doing the hard work of making camp, I shirked duty, and ascending the slope on the south side of the cañon took a number of photographs of the walls opposite. Three towering rocks mark the highest part of the cañon; below, the

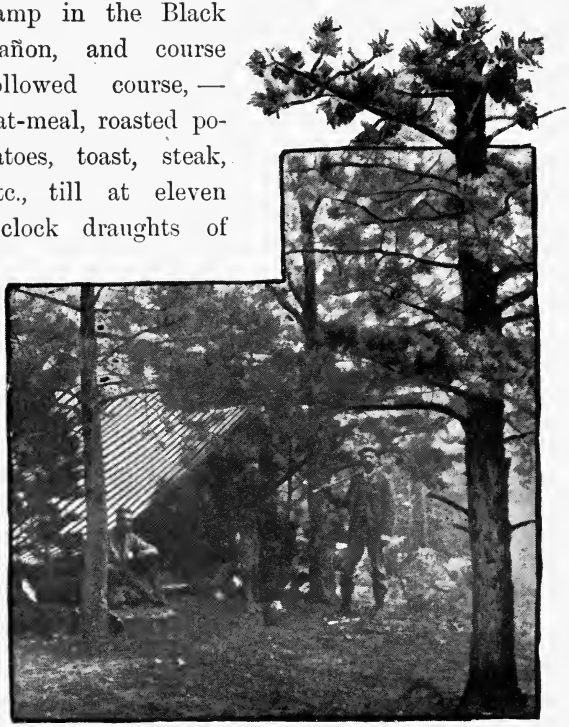
MOUNT FAIRCHILD AND HAGUE'S PEAK OVER MARY'S LAKE.

summits are dome-shaped, and far down, near the entrance, two sculptured figures stand out from the parapet, appearing almost exactly like two great owls. These remarkable rocks interested me; but I was soon obliged to leave them, for I had only been gone from camp an hour before it commenced to rain. The rainy season was supposed to be over; but this night gave such supposition the lie, for the storm continued all through the dark hours. The fly-tent shed most of the water, and we slept soundly and were kept dry. This was the only occasion on which we used a tent in expeditions among the mountains; and it was very fortunate that we brought one this day.



Our camp was certainly a luxurious one; such living as we had, if continued, would soon spoil one for hard trips; but it was a reaction against

the very simple fare that I, as commissary, had imposed upon my friends in Camp Ypsilon. Another acted in this capacity in the memorable camp in the Black Cañon, and course followed course, — oat-meal, roasted potatoes, toast, steak, etc., till at eleven o'clock draughts of

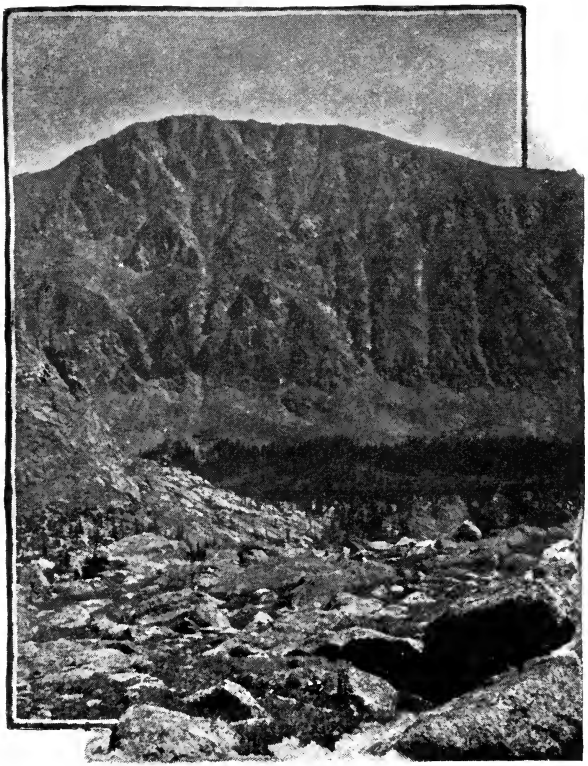


chocolate ended the supper, and pipes were brought out. The commissary also did the proper thing in the morning, — built a fire before we were awake,

and at five o'clock whispered gently in our ear, "Coffee," which we drank before getting up.

The day dawned so dark and rainy that it was seven o'clock before we decided to start. One of our number had brought a horse, on which he proposed to ride as far as the trail led up the cañon. This was a great gain to the rest of us also, as he carried the lunch. We started off at a terrific pace, knowing that we must hurry. The pedestrians got very wet, but the horseman was so thoroughly soaked and chilled that at half-past nine he decided to turn back. He had received all the water from the wet branches that he had ridden through, while the rest of us were only wet below the knees.

Mr. Edmands, Professor Fay, and I kept on toward Lawn Lake, which we reached at quarter before eleven. This lake is certainly a marvellous sheet of water, situated in a valley about 10,700 feet above the sea. It is over half a mile long, has beautiful grassy slopes on all sides, and fine groves of spruce near its banks. High above, on the south, loom the crags of Mount Fairchild. The precipices of Hague's Peak rise three thousand feet above one on the north, and at the end of the valley are the buttresses of the west peak of the Mummy.



Summit of Hague's Peak.

We made for this mountain, our route sometimes leading through a maze of bowlders, and then up steep grassy slopes; then again over level

greenswards where innumerable rills wandered. Among the rocks we saw two badgers, the only animals larger than conies that we met this day. They seemed alone in this wild solitary basin, and we did not disturb them with a shot.

We passed two lakes at the base of the peaks of Mount Fairchild, lunched near the notch between that mountain and the Mummy, and soon began our ascent.

It is rarely that the climber in the Rockies meets with much difficulty in ascending the accessible sides of the peaks. I have already pointed out the fact that an easy route is generally found to the summits; but the illustrations which refer to Long's Peak and Ypsilon Peak show conclusively that one face on each of these peaks is absolutely inaccessible. On this day we seemed to have struck the rocks on the Mummy at a place which gave us the only bit of difficult scrambling that we found during the summer. If they had been a little more difficult, we should have been obliged to make a long detour. When our work commenced the weather was fair, and we had clear views of the valley below, and of the surrounding peaks; but as we got higher up, a dense fog settled down upon our peak, and later snow fell, making the rocks quite slippery. To

select an easy route was impossible; the ledges became barely practicable. Fortunately the dip of the strata was in our favor, the rocks were pretty firm, and we mounted higher and higher. The storm added to the weirdness of the situation; splintered crags appeared before us like the weathered towers of ancient fortresses. Overhanging rocks forced us to edge around on narrow ledges. Seen through fog, rain, or snow-flakes, the heights above were magnified, and the Mummy, which from the valleys seems as if in repose, now showed itself an angry mountain. Lover as I am of clear, distant panoramic views, yet I would not like to have missed this day's experience. We finally overcame all difficulties; but on gaining the summit, denser clouds encompassed us, and snow-squalls rushed over the peak. The temperature was 34° above zero. Very soon we started down toward the glacier. The clouds grew thicker and denser, and we could see but a little way before us. After descending to what I thought the proper distance I hesitated, for I knew we must be within a few hundred feet of the ice, and also realized that in the obscuring fog it would be very easy to go a little too far to the left, and be landed in the Cache la Poudre valley. In a few minutes the clouds lifted a little, and I recognized

the snowfield where the grizzly crossed the year before.

I glanced to the left and waited for the uncovering of the great ice-field. We had to linger but a moment; a sudden rush of wind dissolved the mist, or bore it up the steep slopes, and the weird ice-field lay before us, its summit line of snow high above us clearly cut

against a fog-bank, and great yawning crevasses even with our eyes. It was a supreme moment to me, for I had talked so much to my friends of this ice-field and its wonders, that I feared their disappointment; and now when their exclamation came forth, "Wonderful!" I was exceedingly gratified.

The situation had changed but little in a year.

Some of the rocky spires had fallen; but the general line of cliffs stood intact, even the nose of the profile rock had not varied in shape. The crevasses were narrower but longer, and extended nearly across the field. The blocks of ice were much larger in the lake, and were deeply grooved both on the upper and lower surfaces. Thin pieces of ice were also floating there, side by side with the icebergs, clearly illustrating the difference between the frozen lake-water and masses which had fallen from the glacier. The tops of the bergs were like crusted snow, while the under surfaces were clear blue ice. The temperature of the water was 34°, the same as that of the air on the summit of the peak. Our altitude was about 13,000 feet.

We left the base of the ice at about three o'clock, reached a deep notch between the two peaks of the Mummy Range in an hour, and immediately tackled the steep though not difficult side of Hague's Peak. We reached the top in an hour and a half; so late in the day, it was rather cold, but we thoroughly enjoyed the view. Magnetic properties of the summit rocks again interfered with our topographer's work in taking angles.

Isolated from the Front Range by deep valleys,

this peak is certainly well calculated to serve as a view-point from which to observe the surrounding mountains. It was a delight to me, as I lay on the rocks, to look at the many peaks that I had climbed in the range, and recall incidents in the different ascents. But two elevations of importance remained for me to scale in the long line extending from Long's Peak to our mountain, one of which, fortunately, I am able to describe in the concluding chapter.

As viewed from the valleys, and from many points in Estes Park, it had always seemed to me that the west peak of the Mummy Range was a trifle higher than Hague's Peak; but when on the former summit the year before, it seemed as if Hague's was the higher of the two; and now, as we looked back at the west peak, it certainly did appear higher than our position, and the barometric record of the day gave it about two hundred feet the advantage.

The lateness of the hour did not allow us to linger long over the view, and the knowledge of the character of the blind trail which we must follow after reaching the cañon made us look anxiously at the declining sun. It was five o'clock when we turned from the summit, and started at a rapid gait down the precipitous sides

of Hague's Peak. We were not much fatigued by our long tramp, so we sprang lightly from bowlder to bowlder when among rocks, and ran swiftly over the lower grassy stretches and down through the timber that clothes the slope above the trail; yet darkness overtook us in the forest lower down, and we had a struggle among its mazes. We lost all trace of trail, and only knew of our emergence from the cañon by our voices ceasing to return echoes from the walls above. Fortunately, when we reached our camp, a wagon was waiting for us; all the traps had been packed up, and an hour later saw us at Ferguson's.

As the result of the experience of three expeditions, perhaps it would be well to state the best way of visiting the four peaks in this neighborhood; namely, Ypsilon Peak, Mount Fairchild, and the two summits of the Mummy Range. A passable trail leads up Black Cañon to Lawn Lake, and near it there is good feed for horses. A camp could be pitched there the first day; Ypsilon Peak and Mount Fairchild ascended on the second; Hallett Glacier and the two peaks of the Mummy Range on the third; and a leisurely return made to Estes Park on the fourth day.

MOUNT HALLETT TO STONE'S PEAK, FROM DEER MOUNTAIN.

CHAPTER VIII.

STONE'S PEAK.

THE period of my stay in Estes Park was drawing to a close. I had almost made up my mind to take no more trips among the higher peaks. On the evening of August 17 three of my mountaineering friends left Ferguson's for Lamb's ranch, with the intention of ascending Long's Peak on the following day. I could not well be away from home that night, so could not go with them; but seeing them stride away from us, all my restless qualities were aroused, and I said to our leader, who was standing in the crowd which had gathered to see the climbers off, "Why not start early in the morning and ascend the peak above Willow Cañon? This will be a novel expedition." He assented; though maintaining that it would be a very long day's tramp, and that it would be much better to camp at timber-line. "However, we will try," he said. So in the bright moonlight we went out into the pasture, rounded up the horses and got them into

the corral, in order to have them ready for an early start.

At four o'clock the next morning there came a tap at my cabin window.

"Hallett?"

"Yes; time to be off."

We were on our horses in half an hour, and were soon riding at a wild gallop toward Willow Cañon.

In Willow Park we disturbed two deer that were feeding in the meadow; they speedily left for the mountains, and we had no time to follow. It was fortunate for us that we took horses for the first part of the journey, for in following the cañon trail we were obliged to ford the river several times. At quarter-past seven we reached the end of the trail. Tying the horses, with no other burden than a canteen of milk, lunch, barometer, and field-glass, we pushed on and up through the forest. It was a delight to be free from heavy weights; and much as I needed the camera on many occasions that day, I do not regret having left it behind.

Very soon we hit upon an old elk-trail, which was of much use for a while. In it we observed fresh tracks of a mountain lion. We reached the junction of Fern River and the Willow Cañon

stream at eight o'clock, and then followed an unnamed creek, the sources of which we were to know better later in the day. We soon crossed it to the right, and climbed steep wooded slopes till, at ten o'clock, we reached timber-line (altitude 11,100 feet). Here we attacked a ridge, which we hoped, and not in vain, would lead us to the main peak whose side was marked by a large snow-field. Our route lay over the summit of three very steep minor peaks, and we were often brought face to face with precipices, and obliged to change our course. In among ledges were frequent grass-plots, where we noticed signs of big-horn. Rounding a crag we suddenly startled a noble ram,—a perfect speci-

Playground of the Big-horn.

men, with magnificent curling horns. He leaped from rock to rock, and disappeared, only to reappear on successive ledges to take a look at us. After gaining a considerable height above us, he seemed to take courage, made longer rests, and once stopped to rub himself against a projecting ledge. We had several opportunities to examine him with the field-glass. He soon reached the summit of a ridge, and standing for a moment on the crest, his beautiful form projected against the sky-line, he gave us a parting glance and was not seen again. We moved on, and immediately another ram jumped up in front of us. This time so great was the bewilderment of the animal that he did not think to go up the mountain, his natural way of escape, but rushed down a narrow gorge which ended in a precipice of a thousand feet, and paused on the outer rim of the dizzy cliff. A pistol-shot would have killed him. We could have knocked him over with a big stone, but of what use such cruelty? We could never have carried home the trophy. He glanced at us a moment, and his figure neatly balanced was a most interesting spectacle. The next instant he jumped to a ledge under the tower which we stood upon, rounded it in two skilful bounds where we could not have passed, and escaped down the mountain.

Reasoning that more of the animals might be feeding on the grassy slopes of the opposite sides of the mountain, we were on our guard against more surprises. With the wind dead ahead we climbed very carefully, and as we surmounted each ridge, we kept our bodies hidden, and worked our way very carefully for two hours, crawling in many places, till we reached a point where only two peaks remained between us and the snow-field. Creeping to a notch we peered over a broken ledge, and were rewarded for our long fatiguing stalk by beholding twelve big-horn quietly feeding or resting only a hundred yards below us. The first ram had evidently gone higher up the mountain, so had not alarmed the flock. Quickly and stealthily slipping over the ridge, we slid behind a bowlder, and were able to observe with a powerful field-glass the family life and movements of these wild animals perfectly unaware of our presence. The flock consisted of eight ewes, two yearlings, and two very young ones. The latter we frequently observed in the act of sucking. An old ewe lying on an eminence seemed to be doing guard-duty. The flock moved but slowly; we noticed some getting up and others lying down. It was an hour before the group passed out of sight around the side of the mountain.

Notwithstanding our proximity to the big-horn that day, it would have been impossible to have photographed them, even if we had brought a camera; for, on account of the roughness of the ground, I could not have got the instrument in place quick enough to catch the rams in a good position; again the flock was too far removed, and their color, a dusky brown, too nearly that of the rocks among which they were moving, to secure clearness of outline in a picture. Seventy-five yards is about the limit of distance at which a picture of animals of such size, that is, about six feet long and three feet six inches high, could successfully be obtained.

At two o'clock we were on our way once more, and half an hour later, near the top of what I call for convenience "Peak No. 3," a fierce snow-storm obliged us to take refuge under a ledge. The whirling snow-flakes blinded us so that we could not face the storm. The temperature was about 45° Fahrenheit above zero. In a half-hour the weather cleared about us, and the storm drove towards Long's Peak. Now we saw below us a beautiful rainbow thrown against the long range north of Willow Cañon. The arch rested entirely on the mountain, no part of it reflected on the sky, — a necessary result of such a phenomenon at

that time of day. The barometer gave 13,100 feet as the altitude of "Peak No. 3."

At three o'clock in a violent wind, which had followed the snow-storm, we stood upon "Peak No. 2," altitude 13,130 feet. The gale, however, soon subsided, after clearing the air of clouds, and our view was unobstructed. A light covering of snow lay over the great range; but the power of the sun was so great, that in an hour all the snow was melted, and no one would have believed that there had been such a squall.

The main peak was now within our grasp; but being in no hurry to bag it, we first strolled to the west edge of the mountain, and looked down into a beautiful green valley whose stream is a tributary of the Poudre. I do not doubt that elk can be found in this valley; surely it is just the place for them. I had long wished to stand at this point, in order to examine with a field-glass two large snow-fields which, when seen from the summit of Ypsilon Peak, I had thought might prove to be of a glacial nature. From this nearer view-point they showed clearly their true character; they were simply large shallow snow-fields.

The ragged and wild appearance of the mountain tops surprised me; and this view, now comparatively unknown, is destined, I think, to become

famous. One sharp rock-peak directly to the southwest of Stone's Peak deserves the attention of mountaineers.

As we turned and climbed towards the summit of Stone's Peak, rising above the peaks to the west and now at our backs, we often stopped, faced about, and looked at them. Clark's Peak, in the Medicine Bow Range, is a beauty from this point. Specimen Mountain, recognized by the kite-shaped snow-field near its flat top, was especially interesting. This mountain, as well as a number of similar peaks around it, has been the scene of volcanic disturbance, or, as Lamb of Long's Peak says, "of a blow-out." Its sides are said to be covered with pumice.

Now came the great event of the day. We had nearly gained the top of the peak, and were crossing a ridge with our faces turned toward the south, when there came in view a large snow-field that no one would have expected to find in such a position. Mr. Hallett exclaimed, "There's a frozen lake for you!" Then both of us cried, "A glacier!"

At quarter-past three we were on the highest rocks of Stone's Peak. I at once read my barometer, and took compass bearings. The altitude was found to be 13,500 feet. The west peak of

Mummy Mountain lay due north; Hague's Peak 15° east of north; and Long's Peak 10° south of east. The observations were made with all possible haste, as no time was to be lost if the marvellous snow-field was to be reached. At four o'clock we were off. We realized that we were imperilling, if not life and limb, at least our comfort and the peace of mind of friends at the ranch, in thus launching out in a direction away from home at that time of day instead of turning toward it; but our excitement was too great to listen to the counsel of prudence. Though foreseeing that we might be headed off by some cañon wall in taking an unknown line of descent, we thought that we could still make timber-line at least by dark, build a fire, and keep warm.

Our descent was rapid. We went over the top of two rocky needles and reached the slopes of the peak which bore the snow-field without having gone below the level of the foot of the ice; but alas! here we were turned from our nearly direct high-level route by a sheer wall, and were obliged to drop down several hundred feet, then reascend to the same altitude. The whole descent and ascent was made at a running gait, and the ice was gained at five o'clock. The altitude was 12,100 feet.

Immediately before reaching the semi-frozen lake that lay at the base of the ice, we skirted the sides of a tarn, then surmounted a dike from the top of which the wonderful snow-slope could be seen from summit to base. It lies on the north face of the mountain, inclined at as steep an angle as will allow of clinging snow. By the east edge it might be possible to ascend the rocks, but on the west side all access is barred, for the snow fills a basin whose walls of rock rise, on that side, smooth and sheer without ledge or cranny. The ice-slope itself could not be climbed without laborious cutting of steps. It is similar in appearance to the snow-field on Table Mountain, but larger and deeper. The evidence that it is of a glacial character rests entirely in the fact that blocks of ice twenty to thirty feet square, and from three to six feet thick, have fallen off into the water, showing that they have been squeezed out by pressure from above. A tongue of ice extended out into the water for perhaps thirty feet, having in it, under water, three large wedge-shaped crevasses, while above the water-line were five similar ones in succession. Some hundreds of feet higher up, on the west side, were several ice-chasms, one that was probably eight feet wide.

The snow-field is not over a quarter of a mile wide, and a thousand feet high. It is a body of *névé* to which there is no trunk except the tongue of ice referred to, which is the result of pressure, and resembles an ice-stream. In comparison with Hallett Glacier it is much steeper, rivals it in the size of the ice-masses that have fallen into the lake, but is inferior to it in the size, though not in the number, of its crevasses.

The cliffs that surround the ice are so smooth and worn that but little debris falls on the snow. A few small stones lay on the west side, and quite a large mass of bowlders rested on the eastern edge, about a hundred feet above the lake. My impression is that any rocks that fall on the ice near the summit are carried down and deposited in the lake.

The top of the dike which walls in the water is free from loose stones. On the lake side, however, it is covered with rocks, and all along the banks of the lake are big bowlders. While I was examining the ice my companion cut his name on a little stick which he carried, and building a cairn on the top of a large rock on the edge of the water, left the stick in the cairn.

Standing upon the dike high above the lake, just before leaving the ice-field, I was surprised

to find that I could see a point on Sheep Mountain, where I had stood in July, and there made record of the snow-fields visible, twenty in number. Of these, one situated on Hague's Peak had entirely disappeared, two had diminished to minute white patches, while the remaining seventeen had essentially retained their size. I never should have suspected that this particular ice-field, one of the seventeen, had such great size and depth; but a few days later, when visiting Sheep Mountain, I found that I could see, with the aid of a spy-glass, the large crevasses before referred to.

At half-past five o'clock we began to realize that we must take a return journey, part of it over unfamiliar ground, and must cover a distance that had taken us twelve hours' time to accomplish, — ten hours in actual motion. We got under way. Evidently it was a great day for game, for we started up two badgers the first thing. It was fortunate for us that daylight lasted while we were descending the ledges, for it would have been a hazardous undertaking two hours later. Lower down very steep grass-slopes required care on account of their slipperiness, caused by rain; but we were able to make very quick time until darkness overtook us in the dense forest and long be-

fore we reached the trail. What had been snow in the mountains had been rain in the cañons, and we were wet through.

This unnamed and unexplored cañon rivals in the steepness of its walls many of the famous gorges of Colorado. A grand forest fills it from Willow Park nearly up to the Continental Divide; fires have never ravaged it; it is truly primeval. The noble trees are Engelmann spruce, and for several miles we walked among trees seventy-five feet tall. The ground was mossy and spongy. We kept on "benches" as far as possible, but were continually forced to cross and recross the streams to avoid the ledges and rock-falls which swept down on either side.

At eight o'clock it was very dark, but the nearly full moon appeared above the southeastern walls and gave us some light. Unfortunately from that time on we had to keep on the southerly side of the gorge, and had only reflected light from the opposite walls, but that was better than nothing. We got along best when we could walk on fallen timber that chanced to lie parallel with the river; but when the fallen trees formed a network we had to go very slowly, sitting down on the logs and throwing our feet over, at the risk of breaking our legs in many falls. Once my

companion turned to me and said, "Are you very tired?" I gave the usual answer for such occasions, "Not a bit."

"It's lucky for you, then, for we are a long way from the horses."

For the crossing of the torrent we always found a fallen log at hand, which we bravely walked upright, notwithstanding the slippery surfaces. At the final crossing, however, after Hallett had stepped lightly over, I basely straddled the log and used my hands as propellers.

What misery we should have endured that night, if we had not been perfectly well and strong! When we struck the elk-trail I wondered if the mountain lion was still near, and for the tenth time lit my pipe. As my companion remarked, if we had been killed by accident or by wild beasts, none but experienced trailers would ever have been able to find our bodies in the dense forest.

We gained the horses at 10.30 P. M. Finding that it was too dark to ride safely for the first half-hour, we floundered along toward the "open," mounting only to cross the stream. A wild gallop we had when we did reach the meadows, and midnight saw us in our cabins.

APPENDIX.

A PARTIAL LIST OF PLANTS GROWING IN ESTES PARK, COLORADO.

OBSERVED DURING THE MONTHS OF JULY, AUGUST, AND SEPTEMBER.

Anemone, WIND-FLOWER.
A. patens, var. Nuttalliana.
A. cylindrica.
A. dichotoma.

Thalictrum, MEADOW-RUE.
T. cornuti.
T. sparsiflorum.

Ranunculus, BUTTERCUP.
R. flammula, var. reptans.
R. sceleratus.
R. Cymbalaria.
R. affinis, var. cardiophyllus.
R. aquatilis, var. trichophyllus.
R. Nuttallii.
R. hyperboreus, var. natans.

Caltha, MARSH MARIGOLD.
C. leptosepala.

Aquilegia, COLUMBINE.
A. cœrulea.
A. chrysantha.
A. brevistyla.

Delphinium, LARKSPUR.
D. occidentale.

Aconitum, ACONITE.
A. Columbianum.

Actæa, BANEBERRY.
A. spicata, var. rubra.

Berberis, BARBERRY.
B. repens.

Arabis, ROCK CRESS.
A. Holbœllii.

Cardamine, BITTER CRESS.
C. cordifolia.

Erysimum.
E. asperum, var. Arkansanum.

Lepidium, PENNY CRESS.
L. intermedium.

Viola, VIOLET.
V. biflora.
V. palustris.

Silene, CATCHFLY.
S. Scouleri.
S. acaulis.

Saponaria.
S. Vaccaria.

Lychnis, COCKLE.
L. montana.

Cerastium, MOUSE-EAR CHICKWEED.
C. alpinum, var. Behringianum.

Stellaria, CHICKWEED.
S. longifolia.

Arenaria, Sandwort.
A. capillaris, var. nardifolia.
A. biflora, var. carnosula.
A. lateriflora.

Claytonia, Spring Beauty.
C. Chamissonis.
C. Caroliniana, var. sessilifolia.
C. megarrhiza.

Sidalcea, Mallow.
S. candida.

Linum, Flax.
L. perenne.

Geranium, Cranesbill.
G. Richardsoni.
G. incisum.
G. cæspitosum.

Ceanothus, New Jersey Tea.
C. velutinus.
C. Fendleri.

Acer, Maple.
A. glabrum.

Thermopsis.
T. montana.

Lupinus, Lupine.
L. Burkei.

Trifolium, Clover.
T. dasyphyllum.
T. nanum.

Oxytropis.
O. Lamberti.
O. Lamberti, var. sericea.

Physocarpus, Nine-bark.
P. opulifolia.

Holodiscus.
H. discolor, var. dumosa.

Rubus, Raspberry.
R. deliciosus.
R. strigosus.

Purshia.
P. tridentata.

Dryas.
D. octopetala.

Geum, Avens.
G. macrophyllum.
G. rivale.
G. Rossii.

Potentilla, Five-finger.
P. arguta.
P. dissecta.
P. supina.
P. gracilis.
P. Hippiana.
P. effusa.
P. fruticosa.
P. Anserina.

Sibbaldia.
S. procumbens.

Agrimonia, Agrimony.
A. Eupatoria.

Rosa, Rose.
R. blanda.
R. Arkansana.

Amelanchier, June-berry.
A. alnifolia.

Saxifraga, Saxifrage.
S. flagellaris.
S. chrysantha.
S. cæspitosa.
S. cernua.
S. bronchialis.
S. rivularis.
S. Jamesii.
S. punctata.

Mitella, Mitre-wort.
M. pentandra.

Heuchera, Alum-root.
H. bracteata.

Parnassia, Grass of Parnassus.
P. parviflora.

Jamesia.
J. Americana.

Ribes, Currant, Gooseberry.
R. cereum.

Sedum, Stone-crop.
S. Rhodiola.
S. rhodanthum.
S. stenopetalum.

Epilobium, Willow-herb.
E. spicatum.
E. coloratum.

Gayophytum.
G. racemosum.

Œnothera, Evening Primrose.
Œ. biennis.
Œ. albicaulis.
Œ. cæspitosa.

Mentzelia.
M. multiflora.

Opuntia.
O. Missouriensis.

Ligusticum, Lovage.
L. apiifolium.
L. montanum.

Linnæa, Twin-flower.
L. borealis.

Galium, Bedstraw.
G. boreale.

Valeriana, Valerian.
V. edulis.

Brickellia.
B. grandiflora.

Liatris, Blazing Star.
L. punctata.
L. scariosa.

Grindelia, Gum-plant.
G. squarrosa.

Chrysopsis, Golden Aster.
C. villosa.

Aplopappus.
A. Parryi.

Bigelovia, Rayless Goldenrod.
B. Douglasii, var. tortifolia.

Solidago, Goldenrod.
S. humilis.
S. humilis, var. nana.

Aster.
A. oblongifolius, var. rigidulus.
A. lævis.
A. adscendens.
A. foliaceus, var. frondeus.
A. glaucus.

Erigeron, Fleabane.
E. macranthus.
E. glabellus, var. mollis.
E. compositus.
E. divergens.

Anaphalis, Everlasting.
A. margaritacea.

Gnaphalium, Everlasting.
G. Sprengelii.
G. strictum.

Rudbeckia, Coneflower.
R. hirta.
R. laciniata.

Helianthus, Sunflower.
H. annuus.
H. pumilus.
H. Nuttallii.

Bahia.
B. chrysanthemoides.

Actinella.
A. depressa.
A. grandiflora.

Gaillardia.
G. aristata.

Achillea, Yarrow.
A. Millefolium.

Artemisia, Wormwood, Sage-brush.
A. frigida.
A. biennis.
A. Norvegica.
A. Ludoviciana.
A. Mexicana.
A. tridentata.

Arnica.
A. cordifolia.
A. latifolia.
A. Parryi.
A. alpina.

Senecio, GROUNDSEL.
S. amplectens.
S. Bigelovii.
S. cernuus.
S. Fremonti.
S. rapifolius.
S. triangularis.
S. serra.
S. crassulus.
S. lugens, var. foliosus.
S. aureus, var. borealis.
S. aureus, var. croceus.
S. Douglasii.

Cnicus, PLUMED THISTLE.
C. Americanus.

Hieracium, HAWKWEED.
H. gracile, var. detonsum.
H. albiflorum.

Prenanthes.
P. racemosa.

Lygodesmia.
L. juncea.

Troximon.
T. glaucum.
T. glaucum, var. dasycephalum.

Lactuca, LETTUCE.
L. pulchella.

Campanula, HAREBELL.
C. uniflora.
C. planiflora.
C. rotundifolia.

Vaccinium, BLUEBERRY.
V. Myrtillus, var. microphyllum.

Arctostaphylos, BEARBERRY.
A. Uva-ursi "Kinnikinnick."

Moneses.
M. uniflora.

Pyrola, WINTERGREEN.
P. minor.
P. secunda.
P. chlorantha.
P. rotundifolia, var. uliginosa.

Chimaphila, PIPSISSEWA.
C. umbellata, "Prince's Pine."

Pterospora, PINEDROPS.
P. andromedea.

Dodecatheon, SHOOTING-STAR.
D. Meadia.

Primula, PRIMROSE.
P. angustifolia.
P. Parryi.

Androsace.
A. Chamæjasme.

Apocynum, INDIAN HEMP.
A. androsæmifolium.

Gentiana, GENTIAN.
G. serrata.
G. barbellata.
G. heterosepala.
G. prostrata.
G. frigida.
G. Parryi.
G. affinis.
G. Bigelovii.

Swertia.
S. perennis.

Frasera.
F. speciosa.

Phlox.
P. Douglasii.

Gilia.
G. gracilis.
G. spicata.
G. pinnatifida.

Polemonium, Greek Valerian, Jacob's Ladder.
P. confertum.
P. confertum, var. mellitum.
P. humile, var. pulchellum.
P. cœruleum.

Phacelia.
P. integrifolia.
P. sericea.

Echinospermum, Stickseed.
E. Redowskii.

Krynitzkia.
K. Californica.
K. virgata.

Mertensia, Lungwort.
M. Sibirica.
M. alpina.

Myosotis, Forget-me-not.
M. sylvatica, var. alpestris.

Lithospermum, Gromwell.
L. multiflorum.

Pentstemon, Beard-tongue.
P. glaber.
P. glaucus, var. stenosepalus.

Chionophila.
C. Jamesii.

Mimulus, Monkey-flower.
M. floribundus.

Synthyris.
S. alpina.

Veronica, Speedwell.
V. Americana.
V. alpina.
V. peregrina.

Castilleia, Painted Cup.
C. linariæfolia.
C. pallida.
C. pallida, var. occidentalis.

Orthocarpus.
O. luteus.

Pedicularis, Lousewort.
P. Grœnlandica.
P. Parryi.
P. racemosa.
P. procera.

Aphyllon.
A. uniflorum.

Utricularia, Bladderwort.
U. vulgaris.

Monarda, Horse-mint.
M. fistulosa.

Brunella.
B. vulgaris.

Scutellaria, Skullcap.
S. resinosa.
S. galericulata.

Stachys, Woundwort.
S. palustris.

Chenopodium, Pigweed.
C. capitatum.

Eriogonum.
E. alatum.
E. heracleoides.
E. flavum.

Oxyria, Mountain Sorrel.
O. digyna.

Polygonum, Knotweed.
P. tenue, var. microspermum.
P. viviparum.

Shepherdia, Buffalo-berry.
S. Canadensis.

Betula, Birch.
B. glandulosa.

Alnus, Alder.
A. viridis.
A. incana, var. virescens.

Populus, Poplar.
P. tremuloides.
P. angustifolia.

Habenaria, Orchid.
H. obtusata.

Spiranthes, Ladies' Tresses.
S. Romanzoffiana.

Goodyera, Rattlesnake Plantain.
G. Menziesii.

Listera.
L. cordata.

Iris, Blue Flag.
I. Missouriensis.

Sisyrinchium, Blue-eyed Grass.
S. mucronatum.

Allium, Onion.
A. cernuum.

Smilacina, False Solomon's Seal.
S. amplexicaulis.
S. stellata.

Lilium, Lily.
L. Philadelphicum.

Lloydia.
L. serotina.

Calochortus.
C. Gunnisoni.

Streptopus.
S. amplexifolius.

Zygadenus.
Z. elegans.

Sagittaria, Arrowhead.
S. variabilis.

CONIFERÆ (Pine Family).

Juniperus, Juniper.
J. communis, var. alpina.
J. Virginiana.

Abies, Fir.
A. subalpina.

Pseudotsuga, Douglas Spruce.
P. Douglasii.

Picea, Spruce.
P. Engelmanni.
P. pungens.

Pinus, Pine.
P. edulis.
P. ponderosa, var. scopulorum.
P. contorta.

LYCOPODINEÆ (Club-mosses).

Selaginella.
S. rupestris.

Lycopodium.
L. annotinum.

FILICES (Ferns).

Polypodium vulgare.
Cryptogramme acrostichoides.
Pteris aquilina.
Asplenium Trichomanes.
Phegopteris Dryopteris.
Cystopteris fragilis.
Woodsia Oregana.

EQUISETACEÆ (Horse-tail Family).

Equisetum arvense.