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THE MOUNTAIN

SECOND RAINIER NUM
GRAND PARK AND SUMMERL

VOLUME V · 1912



PUBLISHED BY
THE MOUNTAINEERS
SEATTLE, WASHINGTON

Publication Committee
1912

Lullie Nettleton, *Editor*
A. H. Albertson, *Business Manager*
Winona Bailey, *Historian*
Helen Gracie
Effie Chapman
H. A. Fuller

The Mountaineer

Volume Five

Nineteen Hundred Twelve



Published by
The Mountaineers
Seattle, Washington



David Ford
(V, VI, VII, IX)

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1912
The Mountaineers

26-64
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THE MOUNTAIN FROM GRAND PARK
Lydia Lovering

View taken at an elevation of 6000 feet, looking southwest ten miles to Mt. Rainier rising abruptly more than 8000 feet above the point of view. Aug. 14, 1912.



SHOWING ANOTHER VIEW OF THE MOUNTAIN LOOKING SOUTH FROM CRESCENT MOUNTAIN OVER THE SLUSKINS. AUG. 6, 1912

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Greetings:

From
John Muir
and
Enos Mills



Salutation:

Good luck to your club
God guide your climbing,
every footstep, mindstep, &
heartstep, & lead you ever
nearer to both heaven &
earth.

Faithfully Yours
John Muir.



Salutation:

ENOS A. MILLS
LONGS PEAK, ESTES PARK
COLORADO

October , tenth, 1912

To The Mountaineers:

Scenery is the greatest of natural resources and there could hardly be a more useful activity than that of arousing interest in it. Nature is ever democratic, ever sanitary, ever recreative and always cheering. It is the best of company and in the nature of things there cannot be a more laudable club than the Mountaineers, or one of similar aims and equally high character. The home region of the Mountaineers is unexcelled by any other in the world. You are to be congratulated on situation and thanked for great work already done for scenery.

Unfortunately scenery still is regarded as an outcast and much work is yet to be done in saving scenery from destruction and guarding it until it is appreciated. The outdoors of yesterday is gone forever and the wilderness is vanishing. During the next few years it will be the lot of mountain clubs to select and save for all the people the few remaining scenic places and also to see that all National Parks and scenic reservations of the Nation are given adequate protection and development. Do we not need a National Park Department or a Scenic Bureau? Scenery is one of the great assets of this country and its value is steadily increasing. Then too, Scenery has a large and important place in the making of good citizens.

Enos A. Mills



L. E. L.

The Mountaineer

Volume Five

Seattle, Washington

Nineteen Twelve

THE HIGHER FUNCTIONS OF A MOUNTAIN CLUB*

WILLIAM FREDERIC BADÉ

Mountaineering as a form of sport is a relatively recent arrival among the recreational interests of mankind. In vain one searches the literature of antiquity for evidence that the ancients were interested in the conquest of mountain heights for the satisfaction of athletic and aesthetic impulses. When mountain ranges have been successfully traversed in the pursuit of other ends, an ancient chronicler sometimes allows himself a momentary exultation, but more because of what has been escaped, than because of what has been braved.

The earliest record of this kind known to me, made 1259 B. C., more than a thousand years before Hannibal crossed the Alps, is an inscription on the front of the temple of Rameses II at Abusimbel, Egypt. It commemorates the arrival at the Egyptian court of King Hattusar of the Hittites and his daughter. Together with their retinue they had made the long journey of a thousand miles from central Asia Minor to Egypt, crossing the Taurus mountains in winter time. Although they doubtless selected the easiest passes, it was a notable achievement, and was felt to be such by the Egyptian monarch, who three thousand years ago bade his scribe sculpture this simple tribute on the walls of the royal sanctuary: "What can these newcomers be like! To make such a journey when there goes not a messenger to Zahi in these days of flood on the upper heights in winter. . . . The embassy came, their limbs being sound, and they were long in stride."

But instances of this kind, even, which exhibit mountaineering as a necessity rather than as a diversion, must have been rare in antiquity. While mountain fastnesses afforded shelter in times of war, their loftier summits were by the ancients believed to be the abodes of gods or spirits who were ready to

*Dr Badé is the head of the Department of Semitic Languages in the Pacific Theological Seminary at Berkeley. He is editor of the Sierra Club Bulletin and has climbed mountains both here and abroad.

resent an invasion of their domain. Such views survived to quite modern times as in the case of the Matterhorn, and are still held among the more primitive peoples of the earth. The above-mentioned Egyptian inscription contains a prayer to the god Sutekh that he may "dispose to fairness the flood and the cold upon the heights" for the benefit of the Hittite embassy.

The modern interest in mountaineering manifested itself first in connection with the awakening spirit of scientific inquiry. The foremost pioneer in this double enterprise was the French-Swiss physicist Horace Benedict de Saussure (1740-1799). In 1787 he climbed Mont Blanc under the guidance of Jacques Balmat, who had gained the summit for the first time a year earlier.

Slow but substantial progress was made during the next half-century in laying the foundations for the development of mountain climbing as an art and as a form of sport. But the systematic conquest of summits of first-rate difficulty did not begin until the second half of the nineteenth century. Coincident with this new phase of alpinism came the organization of various alpine clubs. First among them was the English Alpine Club founded in 1857. Its organization was followed by the Austrian Alpine Club in 1862, the Italian and Swiss Alpine Clubs in 1863, the German Alpine Club in 1869, and the French Alpine Club in 1874. North America joined the procession in 1876 with the organization of the Appalachian Mountain Club.

But the Pacific Slope, with its misty camps of mountains trailing in tumultuously diversified chains from the icefields of Alaska to the warmth of tropic seas, is destined to be the future arena of American mountaineering. The Sierra Club of California, the Mazamas of Oregon, and the Mountaineers of Washington already have well established organizations and an enthusiastic membership. Upon these clubs has fallen the responsibility of directing alpestrian sentiment and energy on this coast. It is proper that they should ask themselves whether the history of alpine sport, brief as it is, may not suggest new lines of endeavor which have never been fully realized. The plasticity of our western life, unexploited fields of nature study, uniquely favorable climatic conditions, and the existence of national parks big enough for kingdoms in Europe, present advantages which no alpine club of the Old World has ever enjoyed.

The highest function of a mountain club must always consist in the encouragement it affords to the noblest and

cleanest of all sports. It accords well with this primary interest that it should work for the establishment and preservation of national parks where people may camp unhindered and live to the full that outdoor life which is so necessary to their highest physical and intellectual health. Where such parks have already been established the pecuniary rewards of power development will for a long time render them subject to invasion by power grabbers. Only large organizations, created for disinterested ends and vigilant on behalf of the public, can hope to interpose an effective check to corporate greed.

It is fitting that the stimulus which the awakened scientific imagination gave to the art of mountaineering in its infancy should in these days of its relative maturity lead to the cultivation of certain scientific interests that can be most fruitfully pursued amid the free life of the forests and the mountains. The publication of accurate information regarding the trails, passes, and topography of a mountain region is certainly one of the tasks to which a mountain club should address itself.

Next in order comes the study of the *silva* and *flora* of our mountains. The botanical survey of many of our western mountain regions is still very imperfect. Almost any mountaineer with a good eye and a fair knowledge of botany can make a valuable contribution. When all the species have been described and classified there remains the even more interesting task of studying the ecology of mountain plants, their adaptation to their environment and to each other.

Particularly interesting from the point of view of plant geography are the bryophytes and liverworts that inhabit the higher altitudes. Some of them at least may prove to be survivors from past ages of the world's geological history. Certain isolated peaks are found to be veritable islands of plants that live only at certain altitudes, and which, co-incident with the disappearance of arctic conditions after the ice age, were left stranded on the mountain tops like sailors after a shipwreck. Any expert bryologist would be delighted to receive and report on specimens of mosses secured during an ascent and carefully labeled as to date, altitude, and place, and the character of the substratum on which they were found growing. Reports or descriptions of this nature could be printed from time to time in the club publications, which would thereby, in time, become indispensable sources of reference for special investigators.

When the rarer and more exquisite flowering plants of a given region and their habitat have become known, a great service to practical aesthetics and to the enjoyment of future generations might be rendered, on the one hand by preventing their ruthless destruction and extinction by the thoughtless, and on the other by transplanting and spreading them into regions where they are not now found. It is to be hoped that the time is approaching when every mountain club will have a committee, or sub-organization, that shall give particular attention to the conservation of our wild flowers. The lasting good effect of activity along such lines would soon become apparent in our national parks.

What is true of the flora applies in equal measure to the fauna and avifauna. At a little dinner recently, the writer heard the distinguished diplomatist and statesman, James Bryce, express the opinion that children and young people should be taught to take an intelligent and sympathetic interest in the lives of our furred and feathered friends of the mountains and forests; that in this way the natural instincts of childhood can be turned to account for the conservation of our rapidly disappearing wild life.

Recent investigations have shown that certain birds and mammals of the Pacific Coast are disappearing so fast that unless something is done at once to check their destruction by hunters they will become extinct in a very short time. The mourning dove and the band-tailed pigeon, for instance, are so reduced in numbers now that they bid fair to follow the passenger pigeon to extinction. A number of California organizations, including the Sierra Club, have by representatives organized themselves into a Committee on the Conservation of Wild Life. Their endeavor will be to secure immediate legislative action in the most urgent cases. It may properly be regarded as one of the higher functions of a mountain club to give support to such movements, and to encourage and commend such rare philanthropic acts as the recent purchase of Marsh Island in the Gulf of Mexico, by Mrs. Russell Sage, to be dedicated as a guarded refuge for the migratory birds of America. This island had long been the most popular haunt of the southern market gunner, because shore birds flocked to it by the million—only to be slaughtered.

There remains to be mentioned the recreational use of

alpine regions in winter time. Recent years have witnessed a remarkable development of winter sports in different parts of the world, especially in Switzerland. The great possibilities of this relatively new form of recreation were forcibly brought to the writer's attention two years ago during a midwinter sojourn in the Alps. Thousands upon thousands of tourists were coming from every part of Europe to engage in the sports and to enjoy the scenery of the mountains in winter. The most frequented resorts were situated at altitudes ranging from five to seven thousand feet. During January skee-parties made ascents to altitudes of ten thousand feet and over.

Anyone who has observed this trend of outdoor recreation will agree that the winter use of national parks will in the near future come to reinforce the summer use, as surely as morning succeeds night. Snow-shoeing, skeeing, tobogganing, skating, and mountain climbing will claim their enthusiastic devotees. From the sea-level Californian among his ever-blooming roses to the hardy Canadian of the frosty north, the men and women of our Pacific Coast are beginning to hear the call of the snowy pine, of the frozen lake, and of those glistening summits which have a new charm under wintry skies. It will prove a noble function of our mountain clubs to stimulate and foster this love of the heights when the north wind roars.

LITTLE TAHOMA

*O crag-crowned peak, I hail thee once again!
Once more thy lofty crest breeds fresh surprise.
At rest in hanging garden, flower-warmed glen,
O'er waves of ice I lift my wistful eyes
And hail thee; O, I hail thee once again!*

*O jagged spire, I hail thee once again!
'Twas here thy Mother Chaos gave thee birth
To guard thy sire from vulgar feet of men,
And yet, I brave long silent lanes of earth
To hail thee; O, I hail thee once again!*

Edmond S. Meany

THE MOUNTAINEERS' OUTING ON THE NORTH SIDE OF MT. RAINIER*

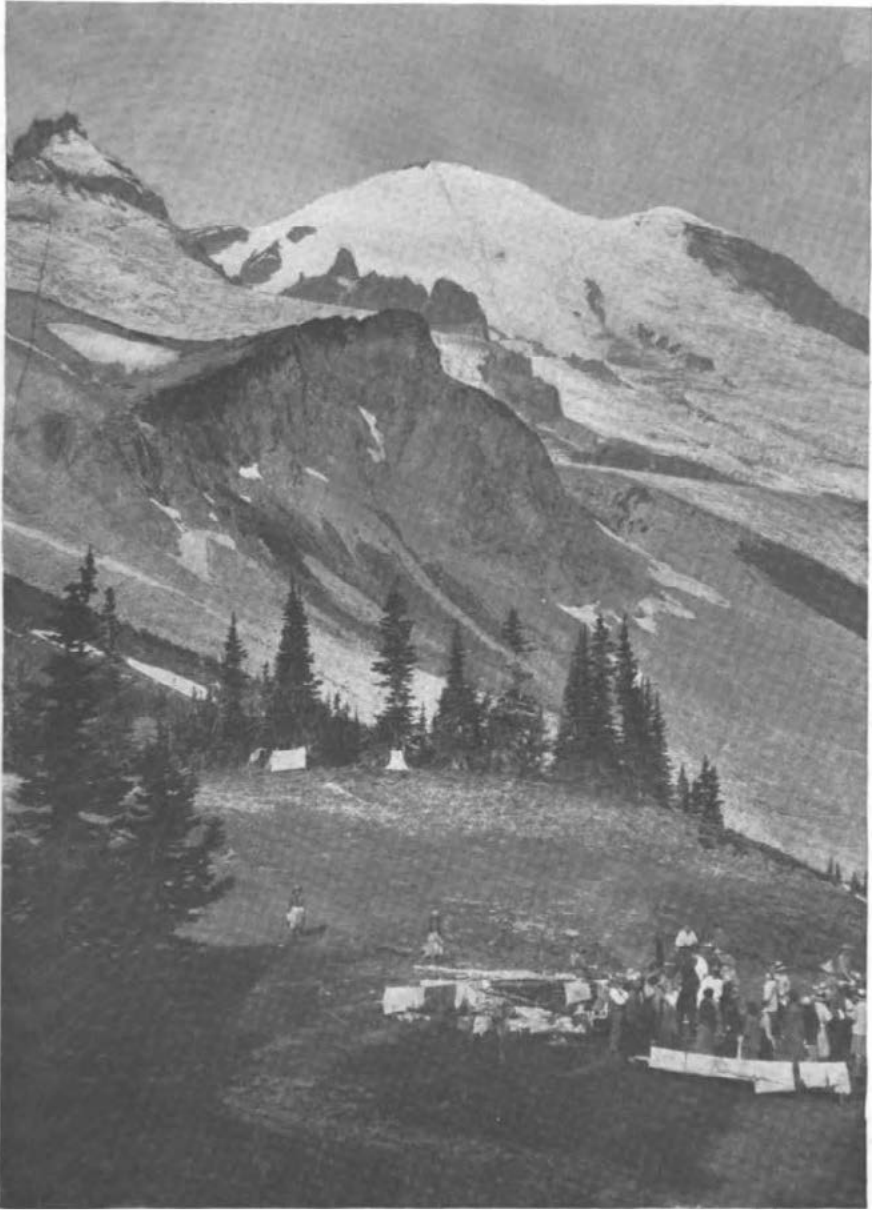
MARY PASCHALL

Briefly, the plan for the 1912 outing of the Mountaineers was to skirt the highest mountain of the State along its eastern and northern slopes, to explore there its least-known parks and glaciers, and finally to scale the great peak itself. All this sounded most alluring to the fifty-five club members, under the leadership of William H. Gorham, who left Seattle on the morning of July 20 to spend three long weeks where the breezes blow fresh from the snows of Rainier (Tacoma).

With the usual joyous good-bys at the depot the trip began, our special car continuing to hum like a bee tree all the way to Lavender, where the dunnage was put off with us to await the coming of the pack train. Through a cloud of dust, at the turn of the road a half hour later, came the rhythmic beat of many hoofs mingled with the clamor of neck bells, chiming to our ears a very paean of delight. Presently they appeared shaking their manes, and a cheer went up to greet as valiant a band of little horses as ever bore pack saddles. In front rode Anderson, powerful even in repose, while "Brud," on his beautiful bay, dashed here and there meeting old friends. Four other packers, rounding up the stragglers, gave promise of what might be expected of them on the day to come, when twenty burden bearers would struggle up the fearful rock stairway of the Frying Pan, leaving our littlest wobbly colt beside the ford. But we were all unconscious of dangers ahead, it was enough for us to be going back to the hills.

Up the Granite Canyon trail, camp was pitched near a spring at the headwaters of Tanenum Creek, and every member of the party straightway began looking for a room in the only inn that is never full. Half the joy of the march is in the magnificence of these bedrooms roofed by the sky. At Summerland it was possible to reach out of one's sleeping bag and pluck

*Outing Committee: Wm. H. Gorham, A. H. Brackett, Fred Q. Gorton.



**MOUNTAINEERS'
CAMP IN
SUMMERLAND**
Chas. S. Gleason

Elevation 6900 feet. View looking west from "men's quarters," showing Little Tahoma and Mt. Rainier, on the sky line; the *Frying Pan* glacier flowing from Little Tahoma north and joining the *White* glacier. In the middle distance: the nose of the middle fork of the *Frying Pan* and the site of Mountaineers' Camp No. 7, July 27-30, 1912, in the foreground.

the flowers; on the heights of Spokwush meadows, one could almost reach the stars.

Following the backbone of the Manastash ridge next day, night brought us to Quartz Creek, where the first Sunday service was held. The second was in Summerland, the last in Grand Park, each temple of worship more beautiful than the last.

The main highways among the mountains, pursued alike by animals, railroads, and mountaineers, are the water courses. Most of the trails, indeed, have taken their names from their river companions. Winding down the southern slope of the ridge through the mottled trunks of the yellow pines, one instinctively looks for the Naches, and dropping into the valley, emerges suddenly from the timber into an open meadow knee-deep in flowers. Beyond runs the river, clear-eyed, singing its way toward the sea; from rift to cataract, from pool to dreaming pool, it flows among the rock-ribbed hills. Where is there a spot where larkspur nods a deeper blue or berries hang heavier? The ford that July morning witnessed the approach of both divisions of the army at once, the horses emerging suddenly from the copse, rushed eagerly to quench their thirst, then splashed on not to lose their places in the brave calvacade; while slowly winding along the rocky palisade above moved "the line," an iridescent ribbon of color.

One can not think of a summer's outing without recalling the camp-fires, yet how is it possible to picture the spirits that enter into the fire-lit circle? The lost art of story telling here returns and brings with it original verse and song to fill to overflowing this breezy chapter of life's out-door holiday. Sitting on the ground at the Forks of the Trail, the gathering place of forgotten tribes of Indians, we listened to their simple stories of earth and sky; heard again their footfalls by the river; and watched the fires that glowed and died before our own was kindled. Through the closing songs of those star-lit nights ran the old, old melody of comradeship, filling all the dark till the very trees clapped their hands and the surrounding hills took up the strain and broke forth into singing.

The Crowe Creek trail, leaving the Naches, rises steadily for nearly three thousand feet. Through the silvery trees of the ghost forest the majestic Fifes Peaks can be seen for many miles. Near Echo Lake we were joined by the Caesar party of

Tacoma, and continuing through Bear Gap found Mr. Brackett and Mr. Corey with thirty-five hundred pounds of provisions. Filing through the rocky portals of an unnamed pass, the party made a rapid descent toward the east fork of the White, rumbling mightily far below. There is an exhilaration of motion in these glacial rivers always fascinating and we were glad to be camped near by for a day, while our "trail gang" slashed a way by which the pack train might reach Summerland.

On the morning of the eighth day hope ran high. The whistle blew the signal to start and "the line" filed away on the Glacier Basin trail to the junction of the White and the Frying Pan rivers. Crossing the turbid stream, the ascent began up a rugged valley, closed on one side by a sheer wall of rock, on the other by close-set trees, while far above and beyond loomed our mountain, dazzling, wonderful. The Frying Pan River, scarcely started in its headlong race, chanted still the songs learned in subterranean galleries under the blue ice of the glacier. Up and higher up toiled the little company. It was hard to hold us back now with the breath of the hills in our nostrils and the hill flowers pressing against our feet. After a final scramble up the last hundred yards, the miniature park itself burst into view; its jutting headlands guarded by turrets of living green were spread for us with carpets of crimson and violet embroidered in gold. We were home at last in Summerland. Here Carr made plans to kill for us the fatted calf, and here also came the first try-out on snow, when the che-cha-kos, standing at the top of a dizzy white slope and told to coast down, balanced first on one foot and then on the other in an agony of indecision whether to try it standing or sitting. They made at last a bold effort, one and all, started scientifically as instructed, using the alpenstock as a rudder and a brake. but missing the trick somewhere, capsized desperately and reached the foot of the declivity rolling like animated boulders from an avalanche.

Among the most striking impressions of these altitudes are the sky-line pictures. Sometimes it is a silhouette pack train or a nodding company of plumed anemones, and occasionally a band of mountain goats drifting upward along the horizon of a ridge. On the tenth day out while we were halted for lunch on the margin of a snow field, there appeared across the deep valley a solitary messenger. It proved to be the man detailed



**RURAL FREE
DELIVERY IN
THE MOUNTAINS**
S. V. Bryant

On July 29, 1912, the Mountaineers were met on the snow fields near Urania glacier by Park-ranger Longmire with mail from Paradise Park.

by the park superintendent to meet the party and bring them word from the great outside world. With breathless interest his progress was watched as step by step he moved down the slope. "How beautiful on the mountains are the feet of him that bringeth good tidings." Could it have been the altitude that set our hearts to beating as the precious mail bag was unstrapped and one by one we heard our names as one hears in a dream? Standing upon the snow, each with his news from home, there was no spoken word, the silence wrapped us as a cloak, those enhungered were satisfied.

Breaking camp the following morning, the opportunity came for a brief study of the great White glacier, the longest in the United States. The sweep of its tremendous body and its grip on the mountain made one think of some prehistoric reptile. Of especial interest were the balanced rocks and the ice needles, scarcely less striking than the seracs on the Winthrop.

Arriving at Glacier Basin a most unique try-out was made to Camp Curtis under the leadership of Professor Flett. We had volunteered to carry fagots above timber line, in order to have a commissary fire when on the main climb; some of us were inwardly sorry of our bargains before we were through. In fact, those sticks had a fashion of increasing in weight every few hundred yards. But who can forget the glimpse of heaven

and earth from that eerie camping spot above the clouds or the delight of the descent into Glacier Basin across the face of Inter-Glacier?

Northeast of St. Elmo Pass and directly opposite the point where the glacier changes suddenly to a river and goes roaring and foaming down the mountain, stands a small pyramid of irregular rocks. It was at this spot that the seeds of the cherished edelweiss of the beautiful Bavarian Alps were planted with appropriate ceremony on August first by the women of the 1912 outing of the Mountaineers. In the Mountaineer Bulletin of April of this year will be found a copy of the letter from Mr. Anton Lang, the donor, together with a short sketch of the traditional significance of this courageous little flower of the Alps, that dares to bloom upon the mountain tops. In improvised costume, the spirit of Bavaria in the name of her country presented the seeds which were graciously accepted by the spirit of the mountains of America, after which they were gently laid away in the brown mould, awaiting the time when the sun in heaven should wake them into life. There is a charm, an atmosphere, that surrounds all planting, from the grain of wheat to the oak tree; here was the added dignity of a mountain clothed in perpetual snow, standing guard over a treasure almost intangible yet associated with all that makes life significant. The few spoken words and the simple verses on the edelweiss, expressed the hope of a people whose freedom rings indeed from every mountainside!

On August first, after hearing the reports of the Major Ingraham party and of the four scouts sent on the preliminary climb, to the effect that snow conditions were extremely bad on the north side of the mountain this year, the main party took the trail for Grand Park by way of Lodii basin. The ascent of the mountain was made by nine men.

Judged by almost any standard one can not be disappointed in Grand Park. A tableland six thousand feet high, it contains more than one thousand acres where the clean winds sweep across the levels and play forever in and out among the perfect groups of alpine firs. To look at sunset across this immense flowery plain at Mt. Rainier is to know it as a new peak and rejoice in the acquaintance. He is fortunate indeed who has thus seen it crowned in the gigantic cloud hood that promises storm. We fully realized the warning that was given us on



GRAND PARK
Kathleen Gorham

This beautiful natural park lies ten miles northeast of the summit of Mt. Rainier on a plateau, elevation 6000 feet, and contains about 3000 acres of mountain meadow with groups of alpine fir and mountain hemlock. View taken Aug. 4, 1912.

Plate V.



VIEW FROM SUMMERLAND
Chas. S. Gleason

Taken from elevation 6800, showing on the left the nose of the south fork of Frying Pan glacier, to the right center, the middle fork, with Little Tahoma and Mt. Rainier on the right sky-line. July 28, 1912.

Plate VI.

leaving the park, when three days later the hood became an umbrella and we were just beneath the drip.

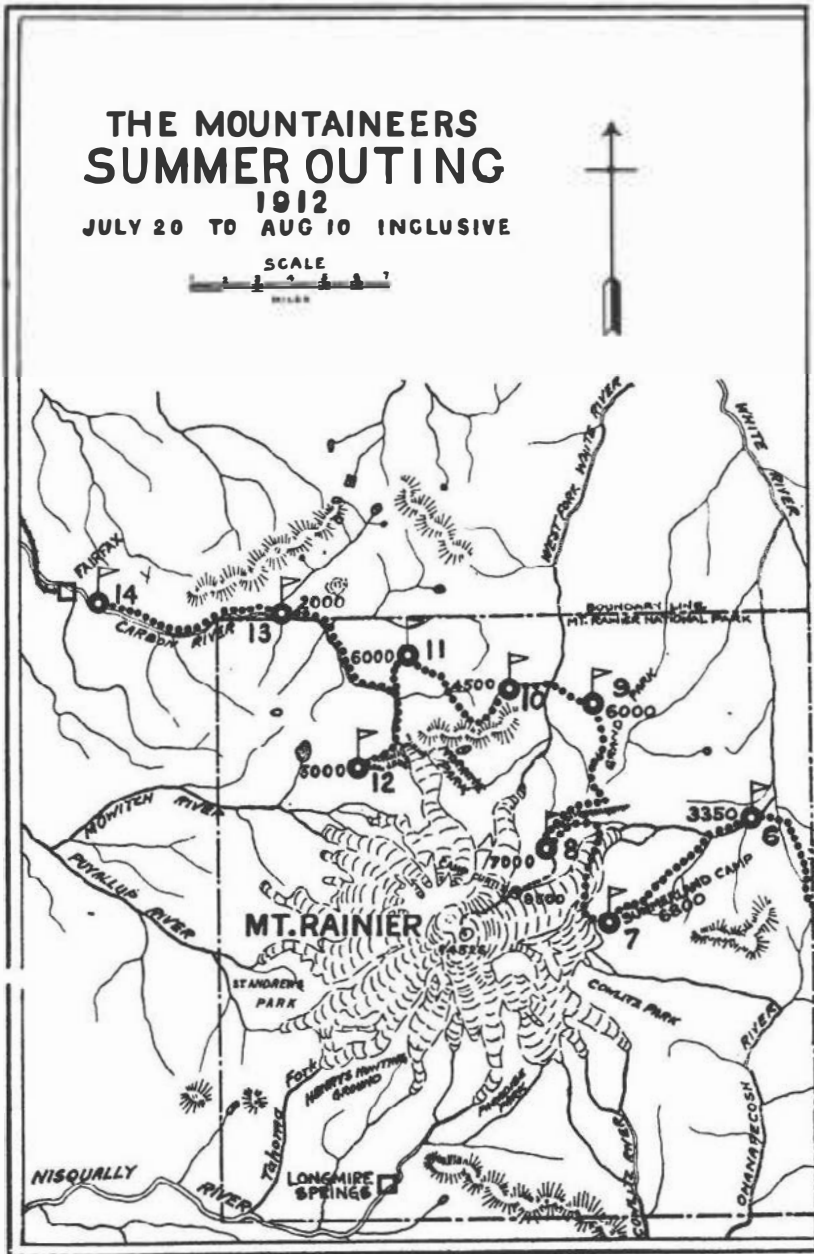
Down the Winthrop and up Van Horn Creek to Spokwush meadows, one is surrounded with vistas. Toward the west from the divide across the torrent-scarred ridges, appears the snowy line of the Olympics, a mile below stands the gray arch of the great stone bridge, while to the south of the valley rise the rich red turrets of the ruined castles of the Sluiskins. Before the blazing campfire, one of our geologists interpreted part of the story from the great stone book that for many days had been spread before our eyes on the rocks and glaciers of this typical volcanic peak, a story as old as the hills indeed, yet ever new and full of interest. Morning came in one saffron sheet, unrolled beyond seven ranges of foothills. Reluctantly we packed and started to breakfast. The women had been asked to bring down their dunnage and there immediately ensued a wild scramble as the bags were released on the heights above commissary. Rolling, bouncing, hurtling downward, they made straight for the fire or the stream. Shouts rent the air at every fresh catapult from above and cheer upon cheer for the hero who dared to stop the missile.

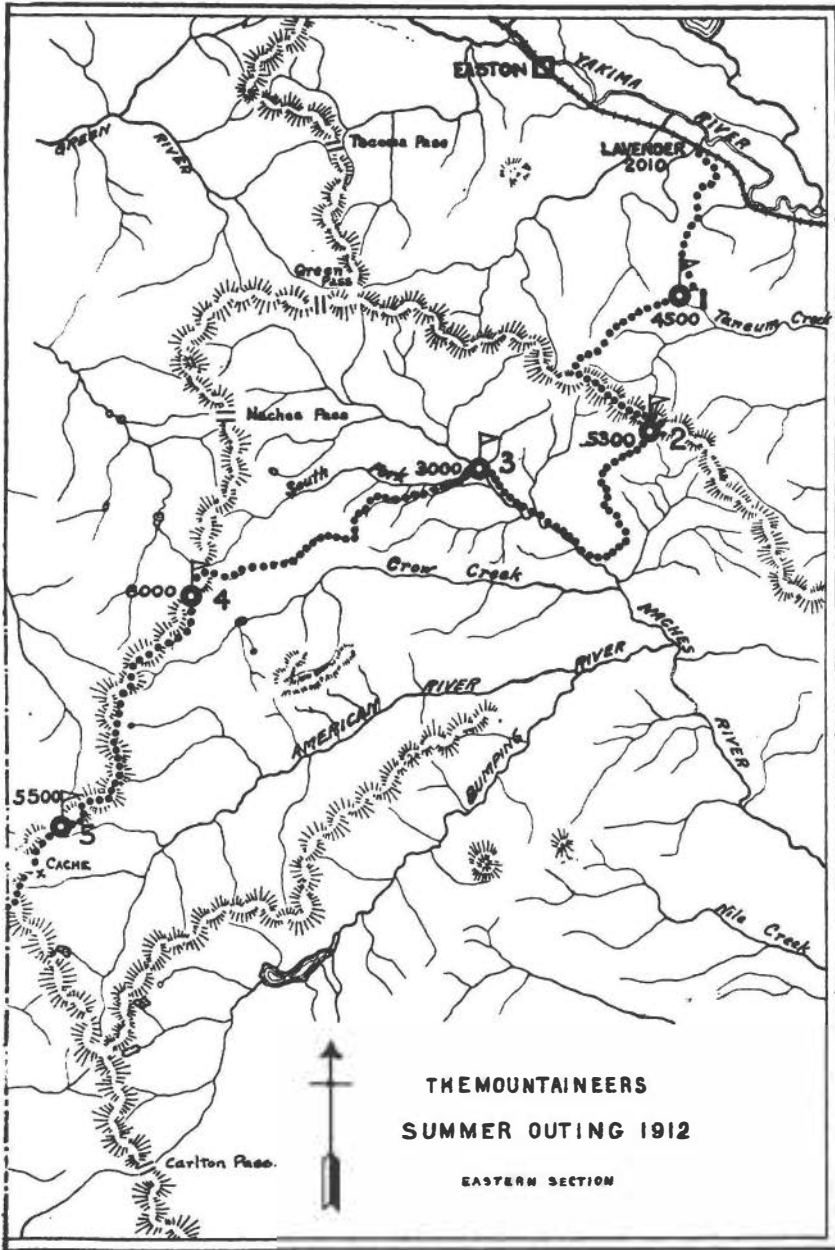
From Chenuis Mountain to Spray Park is not far horizontally, but we alas, measured the distance up and down, so there was but time for an afternoon's acquaintance, a last look at our mountain of mountains, a last rest on our beloved heather, a last race across the snow, and we were off down the trail toward the Carbon river.

The very heavens wept at our departure, and such a down-pour! Yet despite the soaking, it was a right jolly company that gathered that night in Ranger O'Farrel's hospitable cabin to celebrate Christmas in August, with a real illuminated tree and a most real Santa Claus in a fur coat to distribute the gifts.

One more campfire, ending with a "hob-nail dance" in the deserted mining town of Hillsboro, a coveted opportunity to study the coal mine now being actively operated at Fairfax, and we boarded the special car. This time the hill mud clung visibly to our shabby and beloved boots and with it the joy of all that we found, in those wonderful playgrounds among the eternal peaks.

Plate VII.





Drawn by R. E. McKee and Arthur Nathan

ITINERARY OF 1912 OUTING

- July 20. Seattle to Lavender, elevation 2100, via C. M. & P. S. Ry. S. 10 miles to Camp 1 on headwaters of Tanenum creek near summit of Manastash ridge, El. 4500.
- July 21. S. W. 12 m. to Camp 2 on headwaters of Quartz creek, El. 5300.
- July 22. S. to Naches river, W. up old McClellan trail to Camp 3 at "Forks of trail," El. 3000. Distance 11 m.
- July 23. W. up Crow creek trail, 14 m. to Camp 4 on summit of Cascades $2\frac{1}{2}$ m. S. of Arch rock, El. 6000.
- July 24. S. 12 m. along summit trail, passing Bear Gap, to Camp 5 near head of Morse creek, El. 5500.
- July 25. S. to cache at head of Rainier fork of American river, thence to summit on E. boundary of Rainier National Park. thence N. W. down fork of White river to Camp 6, El. 3350. Distance 13 m.
- July 26. At camp while "trail gang" of men of the party cut out trail to Summerland, and packers returned to cache for supplies.
- July 27. S. W. 9 m. up White and Frying Pan rivers to Camp 7 in Summerland, El. 6800.
- July 28. Try-out on Frying Pan glacier.
- July 29. Try-out to Urania glacier.
- July 30. Across Frying Pan and White glaciers and around Ruth Mt., 7 m. to Camp 8 in Glacier Basin, El. 7000.
- July 31. Try-out up Ruth Mt. to Camp Curtis, El. 9500, and return across Inter-Glacier.
- Aug. 1. Try-out through Elizabeth pass and across Winthrop glacier.
- Aug. 2. In camp.
- Aug. 3. Ascent of Mt. Rainier by nine members. Party crossed Sourdough range and through Lodii basin N. to Camp 9 in Grand park, El. 6000. Distance 9 m.
- Aug. 4. Explored Grand park.
- Aug. 5. W. 9 m. descending 3000 ft. into Winthrop canyon and up Van Horn creek to Camp 10 near Natural bridge, El. 4500.

- Aug. 6. N. W. 6 m. via headwaters of Van Horn and Spokwush creeks to Camp 11 in Chenuis basin, El. 6000.
- Aug. 7. S. W. 9 m. descending 3000 ft. into Carbon canyon and thence up Carbon and Cataract creek trails to Camp 12, El. 5000, with side trip to Spray park.
- Aug. 8. W. 9 m. down Carbon trail to Camp 13 at park ranger's station on N. boundary of National Park, El. 2000.
- Aug. 9. W. 8 m. down Carbon trail to Camp 14 at Hillsboro.
- Aug. 10. Two m. to Fairfax on N. P. Ry. and to Seattle by train.
- Distance walked exclusive of try-outs and side trips, 139 m.
Total ascents and descents, 50,000 ft.

CHARLES S. GLEASON



M. F.

THE ASCENT OF MT. RAINIER

E. M. HACK, D. D. S.

Oh fateful, oh unhappy, tearful Friday!

From Glacier Basin, Rainier National Park, on August second, nineteen hundred twelve, at three o'clock in the afternoon of that most direful of all days in the week, was begun the climb of Mt. Rainier.

Glacier Basin has an elevation of approximately six thousand feet and the climb of thirty-seven hundred to Camp Curtis was made by six o'clock. The wood brigade, preparatory to the big climb we all expected to make, had ascended two days before, consequently a goodly supply of fuel awaited our band of nine and right welcome it proved, for a biting wind swept the camp. As protection in such emergencies small stone pens have been erected. The one which comes distinctly to the writer's memory was intended for two persons. Four slept therein, with the agreement that the first position would likewise be the last, and there was forced home to him who rests upon his back the conviction that a brilliant moon very effectually dispels the sleepy phalanx of darkness.

We arose next morning at half after three, in season to behold a most wonderful sunrise. Far below a thick canopy of clouds shut out the nether world, and in the dim and mystic light of early morning, vast mountain ranges were seen suddenly transformed into wondrous cataracts, whose phantom waters rushed downward to break on airy rocks and be transmuted to lovely fairy forms clothed in the rose and gold of the rising sun.

From Curtis the route lay entirely over snow and ice, somewhat softened by the sun at lower elevations, affording an easy footing, but hard and treacherous on the steep slopes at higher altitudes. Considerable dust was noticed on its surface until a point fifteen hundred feet below the summit was reached, when the snow gradually assumed a dazzling whiteness varying in deep crevasses through shades of green to a deep emerald, according to light absorption. Some very good pictures were

Plate IX.



THE ROUTE TO THE SUMMIT P. M. McGregor
View from Camp Curtis, elevation 9500 feet, showing the route up the White glacier to the saddle between Crater peak and Russell peak, 500 feet below the summit, taken by the Mountaineers, August 3, 1912.

Plate X.



A CREVASSE ON THE WINTHROP GLACIER H. V. Abel
View taken Aug. 1, 1912, on a try-out trip of the Mountaineers through St. Elmo pass and across the Winthrop glacier.

taken during the ascent, but they do scant justice to the wonderful snow and ice formations, dreadful in their fantastic beauty.

The members of our party agreed that each man should in turn break or chop steps as necessary, which plan was adhered to throughout the climb, the present worker falling in at the rear when his "trick" was ended, the second in line succeeding him. No special precautions were taken, each person seeming capable of caring for himself. The mascot of the journey was an emergency bandage, which was not used. One regulation army canteen of oatmeal water supplied two men. This mixture proved much superior to either tea or undiluted water.

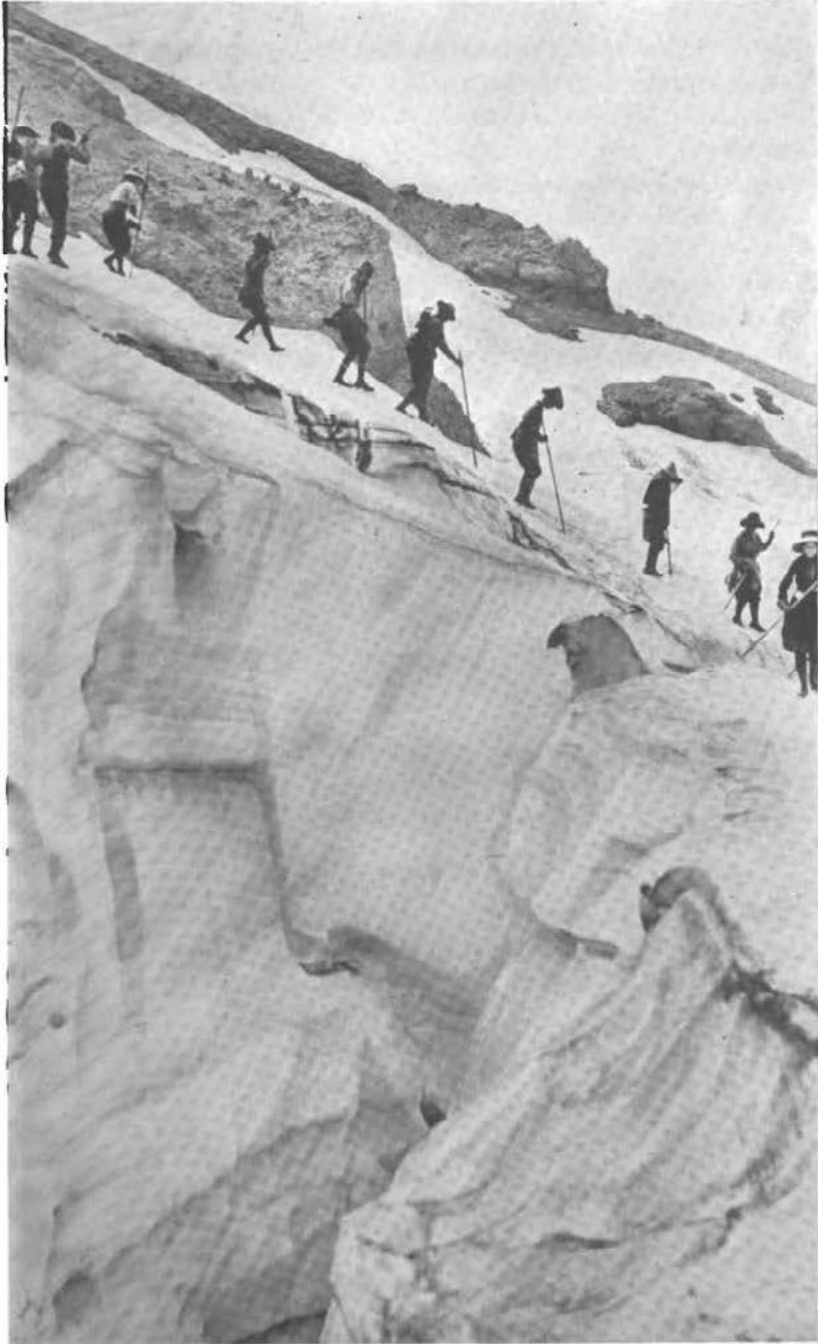
Our route to a point within one thousand feet of the crater was identical with that of the scouts who had been sent from the main body two days previously, with the object of ascertaining the most feasible way to conduct a large number to the top. On these dangerous climbs nothing is left to chance. At an elevation of more than thirteen thousand feet they had encountered a seemingly impassable barrier, a deep crevasse. Professor Flett, whose wide experience on the mountain eminently fitted him to be our pilot, now took the lead and nonchalantly "hit" the ugliest looking trail the writer has ever gazed upon.

The little band scattering out at intervals in uncertain and wobbly effort to follow leader, the writer was left alone for a few minutes beneath a peculiarly formed impending mass of snow and ice, which imagination easily likened to the jaws of some vast pre-historic monster suddenly frozen by tremendous climatic changes, even in the act of devouring its prey. Standing there sheltered from the wind, no living being in view, the earth obscured by floating mists, there was gained for the first time an appreciation of that "eternal silence of the hills." In an effort to understand the ambition which drives us into the very jaws of death after such fruitless victories, thought turned upon the glory of man's achievement in the past, the majesty of his probable destiny. For out of that eternal silence has he come, climbing slowly, painfully, through the countless eons which have vanished in a trackless past. Experience born of the bitterness of misfortune and defeat, his only guide, has taught him how to conquer every obstacle which ignorance and superstition have thrown across his path, yes, even Death

itself. So the answer came from that restless spirit of conquest, which urges us ever onward to the accomplishment of our destiny, to the ever narrowing confines of the land of the unknown.

A shout of triumph echoes through the mountain fastness, a passage has been discovered. True the way is dangerous, but it leads to success and what else matters? One portion conformed much too closely in general contour to the inverted letter V and for a while we experienced a most unseemly envy of the fly and his various appliances designed for sticking fast. Moreover, to give additional comfort, nature had flanked us with two beautiful and very commodious crevasses, the whole furnishing a short and slippery path to that country of golden harps and milk and honey; the praises of which are so often sung by those who have never crossed its confines, and into the realms of which we are so eager that the other fellow should enter. A snow bridge crossed, we approached the upper levels of that graceful, dazzling sweep known as the saddle, guarded by Columbia Crest and Russell Peak. Here the slopes were less precipitous and the snow softer, due probably to recent falls. The hour hand (also the inner man) now indicated one o'clock and we began anxiously to peer about for the celebrated steam caves promised us by Professor Flett. I fail to recall the prevailing idea entertained of those apartments, but our doughty leader had hinted of hissing steam and sulphurous gases, so we expected a large and commanding archway bearing the celebrated legend; mayhap a little devil to receive wraps and a hot lunch seasoned à la Mexicano.

Sad disillusionment! We scrambled, or fell, through a jagged opening in the ice crust into a spooky cavern most comfortably warm and so moist with the condensing steam that our clothes were soon bedewed with glistening drops. Sure enough the steam was escaping in jets through various openings among the rocks and we had the unique and most enjoyable experience of scraping the snow with tin cups from the roof of our house, placing in the icy mixture a cube of condensed bouillon, putting the utensil on the floor over a jet of escaping steam, and in five minutes detecting with eager nostril the delicious aroma of boiling beef tea. And this at an elevation of fourteen thousand feet, under the eternal snows of Mt. Rainier. While perched upon a warm rock munching a most



**CROSSING
INTERGLACIER**
E. V. Abel

Showing the Mountaineers returning from Camp Curtis, elevation 10,000 feet, to camp in Glacier basin, July 31, 1912. Inter-glacier is a banging glacier between the Winthrop and the White, but not connected with either, nor with the great ice cap on the summit.

delicious lunch, we idly wondered how long it would take to complete the process of parboiling, should a miniature avalanche suddenly deposit us in some remote corner of the cavern.

The presence of steam caves is easily explained. The snow falling on warm surfaces at higher altitudes is reduced to water, runs through the still hot rocks of the extinct volcano, and escapes as steam at various points below the snow crust, which is melted in the immediate vicinity of the jets, forming a cave.

Luncheon over, we scrambled again to the upper world and continued our arduous journey, soon encountering a wide margin of small loose rocks extending downward from the rim of the crater, possibly two hundred feet, and swept entirely clear of snow. This, as viewed from Camp Curtis, appears a faint, dark band around the summit. The party reached the crater at three-fifteen o'clock and there across the comparatively level area of the smaller crater was our goal, the semi-spherical, snow-clad Columbia Crest. A few minutes and we stood upon the pinnacle of Rainier's icy mantle. A thick haze obscured the horizon. The utmost heights of Hood, St. Helens, and Adams pierced the cloud canopy and appeared as floating islands in a sea mist.

Two important ceremonies were now observed. The leaders were corralled and a wobbly war dance done around them, then we stood, a row of icicles, while the camera fiends accomplished their fell purpose.

It is interesting to note that several had a heart-beat of approximately one hundred per minute, though he who claimed to be the oldest in the party reported one hundred and thirty. He had been quite sick as we approached twelve thousand feet but recovered after the summit was reached. Respiration with most was somewhat labored while exercising.

The descent was commenced at three-fifty o'clock. The rim of the crater again reached, we cached a paper bearing our signatures and sang a song to the good old tune of "Never again." The ground just here was too warm in places to afford a comfortable seat. Possibly old Rainier may some day pay us its respects in the form of a lava flow and evil smelling gases, who knows?

The higher altitudes above us, the descent became quite rapid, Curtis being reached shortly after six. A half-hour rest encouraged three of the party to continue the descent to Glacier

Basin which was entered at eight, and there we found ample toothsome evidence that Carr had been snoopin' 'round. Next morning the complete party joined the main body in their camp at Grand Park.

The writer is not justified in advancing an opinion concerning the relative merits, hardships, or dangers of this climb. However, Professor Flett remarked in his hearing that a party of twenty men would have found it necessary to spend the night in the crater, and when Camp Curtis was reached on the return journey most of the party were exhausted. The trip proved a pleasure none of us would forego, possibly few repeat.

"Among those present" were Messrs. J. B. Flett, J. H. Weir, and Duncan Pearce of Tacoma; F. Q. Gorton, P. M. McGregor, S. V. Bryant, H. V. Abel, C. A. Hultin, and E. M. Hack of Seattle.

GRAND PARK

*I wish that all the pilgrims
Who seek the mountain steeps
Might rest in these broad meadows
Where wondrous quiet sleeps.*

*Each pilgrim here may worship
In templed emerald spires;
Aloft on massive altar
Still smolder ancient fires.*

*The timid forest deer-folk
These lily censers sway,—
Shy priests of emerald temples;
O pilgrim, pause and pray!*

Edmond S. Meany

A NEW ROUTE UP MT. RAINIER

DORA KEEN*

Probably no other high mountain in the world can offer an approach as beautiful, as wild, and as easy as that from Fairfax, Washington, to the foot of Mt. Rainier. An hour after leaving the railway, the giant cedars and Douglas firs of Rainier National Forest close in on a trail so unfrequented as to seem all but untrodden, yet of easy grade and "good" for the region traversed. By night Crater Lake may be reached and early the next day Spray Park, at the foot of the mountain. Here one may camp with wood and water, and grass for the pack horses, in the loveliest of natural parks.

Could the mountain be climbed by this northwest side, and if so could we get to the summit and back in a day? These were the problems confronting our little party of three, all experienced mountaineers and keen for the fray. Our elevation was only 6,100 feet. We had reached the last wood and water and the pack horses could not well go higher—although in Alaska they would have gone much higher. We could camp no higher, therefore, unless we were to waste the precious days of clear weather in relaying up wood, bedding, etc., on our backs, or go without them. It was mid-September. Daylight lasted only fourteen hours and the nights were chill, but on the other hand the summer's avalanches had nearly ceased and new snow had made travel fairly easy on the glaciers above. This side of the mountain was considered impossible because of the almost continuous avalanches from its steep ice walls during the summer, but now there was frost at night and the day's heat was brief.

To reconnoitre, to study the mountain with glasses was the first step. At 7,500 feet our view was complete and was near enough for a satisfactory survey, so down we sat to plan our route in detail, and to watch for avalanches. We were looking across the North Mowitz glacier from half way up Desolation ridge, and when each of us had picked out his route, we found that we all agreed, not only in our judgment that the mountain

*Miss Keen is a world-famous alpinist whose latest feat was the first ascent of Mt. Blackburn, Alaska.



EAST SIDE OF DESOLATION RIDGE. HIGHEST POINT 9500 FEET

Dora Keen

*Dotted line on photograph indicates the route chosen.

could be safely climbed from that side, but also in every detail of the route chosen. But alas! the fates were against us, for at 9,500 feet the next morning, just where the serious work was to begin, the illness of one of our number compelled us to turn back, and when two days later we finally started again without him, again at the same point a terrific wind made it unsafe to proceed, and the fatal cloud cap determined our retreat. We had neither time nor food for waiting, but so sure were we of our route that I am glad to submit a few notes and views for the benefit of other adventurous mountaineers:

From the last wood and water, below Desolation ridge, something more than an hour's climb, even by lantern, will bring one to the east, snow-covered side of this ridge, which should be followed to its highest point (another hour and a half) almost under the end of Willis Wall. Thence the head of the North Mowitz glacier gives a short and apparently safe crossing to a ridge of rocks that lead up some 2,000 ft. In case these rocks can be climbed with an extra rope, by their outward side, the ascent to the summit would at no point be imperilled by ice breaking off from above, and all difficulties would be solved, for the rocks lead upward to easy snow slopes, on which the summit could probably be reached in another hour and a half. For the ascent of the rocks, prudence would dictate that four hours be allowed, but so far as could be

judged from various points by varying lights, the only point of serious difficulty lies not on the rocks but immediately below them. Here a steep ice slope, rotten ice, and deep crevasses below might require some 200 feet of step-cutting. Care must also be exercised in getting on to the rocks lest procedure too far to the west take the party under dangerous ice cliffs. Weather conditions and season are also important in order to avoid either too much snow on the rocks, or avalanches while crossing the head of Mowitz glacier. The route determined, there remains the problem of an eighteen-hour ascent with only fourteen daylight hours—for September seems the best month for this route. If the start is at 2 a. m., with wind-proof Alpine lanterns, this interesting first ascent by the northwest side might safely be accomplished in a day.

*L. E. L.*

NACHES PASS

EDMOND S. MEANY

During the years 1910, 1911, and 1912, the Mountaineers have seen seven passes through the Cascade Range. Three of these are used by railroads, the others by Indians, miners, and cattle drivers. The one that is probably most historic of all the passes, we approached but did not actually visit during the outing of 1912. This is Naches Pass, the trail which we left at the river ford and proceeded to Crow Creek Pass, about six miles south of the more famous route.

Many of the passes were used by Indians for years beyond computation. As near as I can make out, the first white man to cross the range was Lieutenant Robert E. Johnson who left Nisqually on May 19th and returned to that fort on July 15, 1841. He had traveled one thousand miles, visited the missionary and fur-trading posts, examined the country, and crossed the mountains twice by the same pass. I believe that pass was the Naches. The element of doubt lies in the fact that the report of the Wilkes Expedition, in which Johnson was an officer, refers to the river he followed on the west side as "Smalocho" and the one on the east side as "Spipen." I can not wholly reconcile these with present-day names of rivers.

A sort of triple-headed climax was attained in the history of Naches Pass in the year 1853. In August of that eventful year Theodore Winthrop used that rough trail of Indians in crossing from Nisqually to the Yakima Valley. In his delightful book, "Canoe and saddle," he tells his experiences in a chapter headed "Via mala." His spelling is "Nachchese," but his descriptions are gripping to one who has been over any part of his trail. He met Captain George B. McClellan who had been trying the same pass to find a possible route for a railroad. That engineer pronounced the pass impossible and declared that he would search the Snoqualmie and other passes. His search was a failure.

Earlier in that year Nelson Sargeant had gone over Naches Pass and on out upon the plains to meet his folks who were

coming to Puget Sound by the overland route. He met the train of wagons over which James Biles served as captain. Nelson Sargeant guided them to the Naches Valley and up the mountain slopes. McClellan had called it an impossible pass, Winthrop called it "Via mala," and yet these pioneers hacked a wagon road over the pass in three weeks of the month of October. Over some steep places they used ropes on their wagons and parts of the wagons were left by the way, but the whole party crossed in safety.

In eight days, from June 12 to 20, 1856, Lieutenant-colonel B. F. Shaw marched a little army of 175 mounted soldiers, 107 pack animals, and 27 packers over the Naches Pass to the Wenas branch of the Yakima River. These were Territorial Volunteers serving under Governor Isaac I. Stevens. Officers of the regular army had declared the pass impossible a few days before that successful march by the volunteer troops in that Indian war.

At the outbreak of that war, late in 1855, Lieutenant W. A. Slaughter had crossed the mountains through Naches Pass, but hearing nothing of Major G. O. Haller whose troops had been turned back by overwhelming numbers of Indians near the present Fort Simcoe, he (Slaughter) turned back to the west side of the mountains. Meeting Captain Maurice Maloney with a company of regulars and a company of volunteers under Captain Gilmore Hays, the combined force again crossed the mountains. This time the season had so far advanced that the route was again retraced. Philip H. Sheridan in his memoirs tells of marching from the east side to meet Maloney's force and finding the snows had sent them back.

Settlers near the trail to Naches Pass call it "McClellan's road" and they claim there is a brass cannon near the Pass which was left by that officer in 1853. This is an error; McClellan did not reach the actual pass and the reconnoiter he did make was with two companions and no artillery or baggage. If the traditional cannon is at the Pass it was probably left there by one of the little armies that marched that way during the Indian war of 1855-1856.

THE UNDESCRIBED GLACIERS OF MOUNT RAINIER (*1)

F. E. MATTHES

In the Rainier number of this magazine, which appeared in 1909, Alida J. Bigelow gave an able synopsis of the late Prof. Israel C. Russell's report to the U. S. Geological Survey on the glaciers of Mount Rainier (*2). As she pointed out, that report does not cover the entire series of glaciers of the great volcano, the Kautz, Wilson, Tahoma, Puyallup, and Edmunds Glaciers not being described in it. The fact is that Prof. Russell in the short time at his command, was unable to completely encircle the mountain. Its west and southwest flanks as a consequence remained unknown to him.

The topographic surveys which the U. S. Geological Survey has lately been carrying on in the Mount Rainier National Park fortunately embrace the very portion of the mountain which Russell did not see, and thus there is now at hand a considerable body of data on the glaciers that have hitherto remained undescribed.

The brief descriptions that here follow hardly dare aspire to complement Russell's classic studies; they are offered merely in a preliminary way, in the hope that some day they may be superseded by more thoroughgoing and detailed discussions. In the meanwhile, however, they may prove of interest not simply because they fill a gap long vacant, but because they also seem to indicate the need of a revision of our general conception of the glacier system of Mount Rainier.

That system, which was first outlined by Russell, comprises glaciers of two classes: primary and secondary; the primary glaciers being those having their sources on the summit of the mountain, the secondary glaciers (also termed interglaciers) being those originating well down on its flanks, as a rule in the hollows of the triangular tracts that separate the

(*1) Published with permission of the Director of the U. S. Geological Survey.

(*2) The Glaciers of Mount Rainier, 18th Ann. Rept., U. S. Geological Survey, Part II, pp. 349-415.



**VIEW TAKEN FROM
SOURDOUGH
MOUNTAIN**
Chas S. Gleason

Taken from elevation 7500, looking south by east and showing: From left to right, on the sky-line, Fryling Pan glacier, Little Tahoma, north side of Gibraltar rock, Crater peak, Russell peak, and Liberty cap; in the middle distance, White glacier, Ruth mountain, Camp Curtis, Steamboat prow, Interglacier, Elizabeth pass, Winthrop glacier, and east side of Willis Wall. In the middle foreground is Glacier basin, the site of Mountaineer's Camp No. 8, July 30 to August 3, 1912.

diverging primary glaciers. While this classification admirably fits the conditions on the east half of Mount Rainier, it is scarcely applicable to the west half. Indeed all the large glaciers on the west half, with the exception of one, originate in amphitheatres or "cirques" situated some 4,000 feet below the summit. In point of magnitude, however, they are quite on a par with the summit born glaciers, and to call them "secondary" or "interglaciers" would seem scarcely appropriate. A careful analysis, moreover, shows that the great Carbon Glacier itself—the second largest ice stream on Mount Rainier—is really a cirque-born glacier of the same type as the other cirque glaciers on the west flank. Surely no one would think of placing the Carbon Glacier in the secondary or interglacier class.

In the following, therefore, the distinction between primary and secondary glaciers, as drawn by Russell will be dropped. At the same time, the term "interglacier" will be retained as most apt for the designation of those intermediate ice bodies of small extent that are situated on the "wedges" between the larger glaciers.

Van Trump Glacier. Beginning immediately west of the Nisqually Glacier, the last ice stream on the southeast side of the mountain described by Russell, we find a huge "wedge" that tapers upward in a sharp point. That point, which has an altitude of 13,000 feet, is a remnant of the great crater rim produced by the explosion that removed the original top of the volcano. Immediately below the point is a small hollow in which névé has accumulated for ages. The effect has been to enlarge the hollow until the ridges separating it from the great glaciers to the right and left are now reduced to slender "arrêtes" or "cleavers" as they are locally quite aptly called.

The process illustrated by this tiny interglacier has been repeated in a number of places on the great wedge. Every hollow in its irregular surface has been occupied by a small névé mass, and through the peripheral sapping action that invariably takes place around such ice bodies, these hollows have been enlarged, until now they are separated from each other only by narrow rock walls or cleavers. Thus the wedge has the appearance of carrying a number of ice-filled compartments with intermediate rock partitions. In some instances, even, these partitions have been partly destroyed

and the compartments communicate, so that their ice masses coalesce. The most conspicuous case is found in the central area where a number of basins, large and small, have united, so that their snows now flow together. This compound névé field is known as the Van Trump Glacier.

In former times, especially at the height of the glacial epochs, the Van Trump Glacier must have been much thicker and far more extensive than now, and many of the small ice tongues which, owing to the rapid shrinkage of the last decades are now threatening to become detached, were then part and parcel of the whole. At its lower border the Van Trump Glacier sent forth six lobes, each lying in a deep and narrow groove. These were confluent and ultimately formed two good-sized glaciers and a minor one that traversed the valleys of that charming park country for which the name Van Trump Park has recently been suggested.

Kautz Glacier. Immediately west of the great wedge that bears the Van Trump Glacier lies the ice stream named for Gen. A. V. Kautz, the first explorer to attempt the scaling of the peak. It has its sources in the summit névés south of the new crater. It is a singularly narrow glacier, averaging only one-half to one-fourth the width of the Nisqually, or about 1,000 feet. At the same time it is fully as long as the Nisqually, that is, exactly four miles, according to the new topographic surveys. It receives but one tributary of any size, a glacier still nameless that originates in a profound cirque under Peak Success. At first sight the volume of that glacier appears to be equal to that of the main stream, but the medial moraine which begins at their confluence, by its gradual shifting farther and farther west from the central axis of the glacier, shows that the tributary ice stream is the lesser of the two.

The medial moraine, which is almost two miles long, is very similar to that of the Nisqually Glacier, and like that moraine gradually gains in width and height toward the lower end of the ice stream so that at last it stands out above the ice like a strong embankment. The lower third of the glacier lies encased in a narrow canyon, the depth of which steadily increases downward, until at the glacier end it amounts to nearly a thousand feet. Below the glacier end the canyon suffers a remarkable constriction. For a distance of a quarter of a mile it has a width of only 400 feet. The walls are nearly

vertical, composed of columnar basalt, and it would seem as if the glacier during the times of its greater extension has had to squeeze through this narrow strait, unable to effect any considerable lateral erosion in this resistant material. Closer study, however, reveals the fact that the buttress on the west side of the gorge has formerly been overridden by the ice. The glacier, therefore, when at its greatest height, did not content itself with the avenue afforded by the narrow passage, but overrode the obstruction of hard lava to the west, thus securing an outlet one-quarter to one-half a mile in width.

Immediately below the constriction, curiously, begins the broad, flat floored valley of the Kautz Fork, a valley that seems disproportionately wide for the narrow gorge that empties into it. It is to be remembered, however, that it received ice from other quarters, notably from the region above Pyramid Peak. There is even reason for believing that the Wilson Glacier, when at its greatest height, overflowed eastward through the low pass back of Pyramid Peak and sent part of its volume into the Kautz valley. That that valley was once completely filled with ice is amply attested by the powerful moraines that run the entire length of the great ridge above the so-called "Ramparts."

The view into the gorge of the Kautz Glacier from the heights to the east is a singularly fascinating one that would well repay the building of a tourist trail up the ridge. The entire extent of Van Trump Park with its alpine ridges, gorges, lakes and waterfalls would thus also be opened up.

Pyramid Glacier. From the summit of Pyramid Peak one overlooks a great triangular interglacier situated on a sloping platform between the deeply sunk Kautz Glacier on the east and the Wilson Glacier on the west. It bears no name, but certainly deserves one. Merely in order to give it a handle for ready reference, but without insistence upon the acceptance of his suggestion, the writer will speak of it here as the Pyramid Glacier. In the meanwhile he hopes the Mountaineers of Seattle may settle upon an appropriate appellation.

The Pyramid Glacier heads against the great cleaver that descends from Peak Success. To the east it is separated from the Kautz by a straight, mile-long ridge covered with moraine. It has a length of a mile and a quarter and its greatest width is nearly a mile. Formerly part of its névé shed into the gorge

of the Kautz Glacier, but today its contributions to that ice stream are practically nil. Most of its volume used to cascade into the cirque-like valley back of Pyramid Peak. That region now is clothed in green and is one of the most picturesque timber line gardens the writer has had the pleasure to visit. It is easily accessible even now, although there is no beaten trail. It seems difficult to realize that the total number of tourists who have visited this park thus far probably does not exceed a dozen. Among its chief attractions is a perpendicular waterfall from the edge of a cliff of columnar basalt two hundred feet in height. Until last year that fall was scarcely known to anyone, and remained nameless. The name Pearl Fall was then suggested by one of the park rangers.

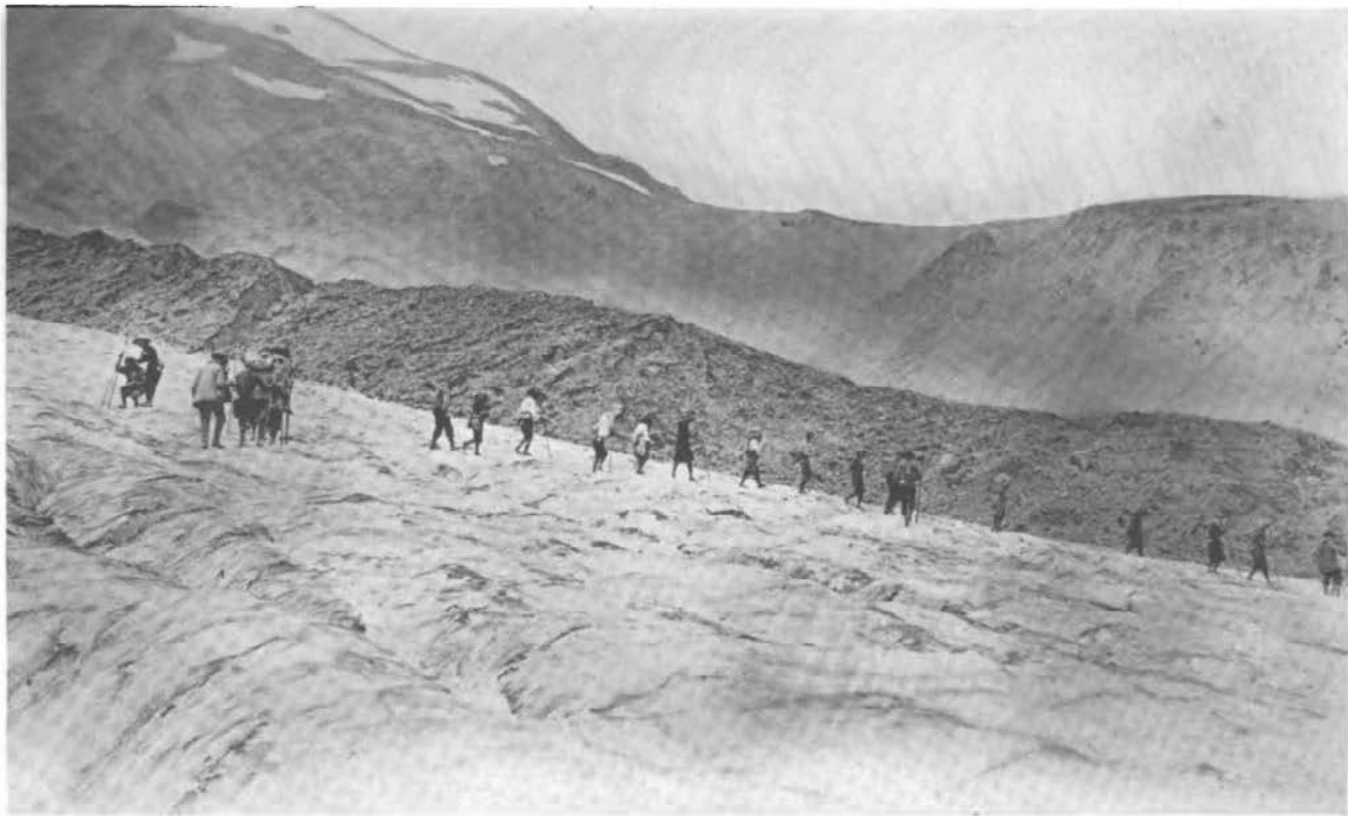
Wilson Glacier. (*¹) The next glacier to the west is the one marked on the old government maps as Wilson Glacier, named for the topographer A. D. Wilson who accompanied S. F. Emmons on his dash to the summit (*²) a few weeks after Van Trump and Hazard had made their first ascent.

This glacier originates in a profoundly sculptured cirque under Peak Success at an elevation of 10,900 feet. It is an even four miles long and throughout its upper course averages half a mile in width. It forms the eastern member of the remarkable group of associated ice streams of which the Tahoma Glacier is the western member. The two great glaciers flow parallel to each other, separated in their middle course for over a mile by a mere row of isolated rock pinnacles, the remnants of an attenuated cleaver which is now partly submerged and over which the névés coalesce. Farther down the two glaciers abruptly part company, and cascade around a formidable pinnacled and deeply scarred fortress of barren rock, to meet again at its base, two thousand feet lower down. From Indian Henry's Hunting Ground one looks out upon this singularly magnificent glacial scene. Strange it seemed to the writer that the imposing rock mass hemmed in by the ice should not long since have been given a name. Glacier Island is the appellation he has suggested for it.

Glacier Island has an extent of nearly a square mile. So excessively steep are its ice-carved sides, however, that it is

(*¹)The old names as adopted by the U. S. Geographic Board will be used by the writer pending possible reforms in nomenclature.

(*²)S. F. Emmons, *The Volcanoes of the Pacific Coast of the United States*, Journ. Am. Geograph Soc., Vol. IX, 1877, pp. 45-65.



**MOUNTAINEERS
CROSSING THE
WHITE GLACIER**
S. V. Bryant

Showing the great lateral moraine on the west side of the glacier. July 30, 1912. This glacier is the largest, finest and longest in the United States. It extends from the summit of Mt. Rainier down the entire eastern slope to the base, averaging two miles wide and about eight miles long.

not readily accessible except to experienced climbers. The island consists really of two rock masses divided by a deep abyss. A lobe from the Wilson Glacier formerly plunged into this gulf, and connected with the Tahoma Glacier, thus splitting the island into two lesser islands. A small remnant of this lobe still exists, but it no longer reaches to the bottom of the gulch.

The south half of the island, upon examination proves to have been entirely overridden by the Wilson Glacier; the higher north half, on the other hand, judging from the greatly weathered appearance of the frail pinnacles that surround it, has never been submerged.

The Wilson Glacier in passing around the island narrows down to a width of only six hundred feet, that is, a width one-fourth of the average width which it maintains above the island. At the same time its slope is greatly accelerated. In half a mile it descends 1,400 feet. Yet the glacier does not appear to break and cascade as it does in so many places farther up.

At the foot of Glacier Island the Wilson Glacier broadens again and unites with the great east lobe of the Tahoma Glacier, the two continuing thence for a distance of three-quarters of a mile as a single mass. This mass one might at first glance not take for a glacier; so entirely concealed is it under a mantle of morainic material. But a live glacier it truly is, as one may readily discover by venturing out upon its treacherous, hummocky surface. The coarse sand and cobbles are then seen to constitute but a thin veneer, through which the clear, blue ice shines in many places. So large are the quantities of powdered rock that bestrew this extensive tract, that the wind occasionally picks them up and creates veritable dust storms with them. The writer while crossing the glacier on one occasion met with such a dust storm, and a most disagreeable experience it proved to be.

Tahoma Glacier. This ice stream is by far the largest on the southwest side of Mount Rainier. Originating on the very summit of the mountain, it descends through the great, mile-wide breach that separates Peak Success from the Liberty Cap massif. For the most part it cascades down in the form of an unbroken stream, but a portion of its mass falls in avalanches down the great precipice that extends northward and forms

part of the wall of the enormous amphitheater under Liberty Cap. This amphitheater, which is second only to that of the Carbon Glacier, contributes a very considerable share of the total bulk of the Tahoma Glacier, perhaps as much as 30 per cent. Strangely, the union of its ice mass with that coming down over the cascades does not give rise to a medial moraine. It will require further investigation to determine the reason for this striking anomaly.

Farther down the Tahoma Glacier broadens to a width of slightly more than a mile, presenting an unruly, billowy surface, diversified by numerous crevassed domes and abrupt ice cascades. Approaching Glacier Island, the great stream contracts until at the west end of the island it measures only 1,700 feet across. Immediately below this point the glacier splits upon a low wedge, sending one lobe to the south and another to the southwest. The south lobe joins the Wilson Glacier under Glacier Island and thus becomes tributary to the Tahoma Fork. The southwest lobe continues by itself for a distance of a mile, giving birth to the southernmost fork of the Puyallup River. The south lobe, it may be added, is accompanied on both sides by splendidly developed lateral moraines; the moraine at the foot of Glacier Island especially is perfect and worthy of a visit.

Measured from Columbia Crest down to the end of the southwest lobe (which has an elevation of about 4,800 feet), the Tahoma Glacier is found to be exactly five miles long. Measured to the foot of the Tahoma Fork lobe it is five and three-fourths miles long.

Puyallup Glacier. The same amphitheater that contributes so generously to the Tahoma Glacier also initiates the Puyallup Glacier, the next ice stream to the north. In the center of the amphitheater rises a bold pinnacle of black rock which parts the névés and from which trails the long and exceedingly narrow rock cleaver that separates the Puyallup from the Tahoma Glacier.

On issuing from the cirque the Puyallup Glacier passes through a chute only 1,200 feet in width. A short distance below part of its mass is diverted northward to the Edmunds Glacier; yet notwithstanding this small beginning and immediate loss the Puyallup farther down spreads out to a width of three-quarters of a mile and then to a full mile, and attains

a length of slightly over four and one-half miles. Its front reaches down to a level of 4,600 feet, the same level reached by the much greater Tahoma Glacier. The reasons for this anomalous state of things will be made clear on another page.

The snout of the Puyallup Glacier affords many points of interest. In the last half mile of its course the glacier describes a beautiful curve flanked by precipitous cliffs which it evidently has undercut. Just above the bend it splits upon a diminutive wedge, the little lobe thus separated hanging like a triangular tongue down a steep slope. Evidently the glacier before it had receded to its present position, used to cascade over the little wedge as a solid stream, filling the capacious amphitheater below that marks the head of the Puyallup Valley.

Edmunds Glacier. This ice stream is the shortest of the series of eleven main glaciers of Mount Rainier. It lies on the west flank between the Puyallup and Willis Glaciers, and partakes of the characteristics of both of these ice bodies. Like the Willis Glacier it originates in a shallow cirque at an elevation of about 11,000 feet. This cirque is fed by direct precipitation, by drifting and by avalanches from the steep rocky flanks of the Liberty Cap massif. In addition the glacier receives, as stated before, considerable contributions from the Puyallup Glacier.

About a mile and a half above its terminus the Edmunds Glacier splits on a narrow moraine covered ridge. The north lobe, which is the shorter of the two, is of interest principally for the strong morainic ridges that parallel it. The south or main lobe carries a great deal of debris, only a narrow lane of clear ice extending between the ever broadening moraine bands on the sides. The south edge of the glacier is shielded by a long and high cliff of columnar basalt, aptly termed the colonnade.

The total length of the Edmunds Glacier is three miles; its average width some 2,000 feet. It reaches down to an elevation of 4,400 feet.

Nameless Interglacier. On the broad platform between the Edmunds and the Willis Glacier lies a great névé field one and one-half miles long and about a mile wide. At an altitude of 8,200 feet it splits on a narrow crest, sending a small portion of its

mass northward to the névé fields bordering the Willis Glacier. To the south, again, it contributes to the Edmunds Glacier. Perhaps the most interesting feature connected with it is the stream that issues from the main lobe. That stream, after cascading noisily down a steep amphitheater-like hollow, tunnels under the front of the small north lobe of the Edmunds Glacier, reappearing farther down reinforced by the melting water from that ice body.

In former times the interglacier attained much greater dimensions and coalesced with the Edmunds Glacier, just as the ice fields immediately north of it now form part of the Willis Glacier. It is to be hoped that a suitable name may soon be suggested for this beautiful interglacier, which in point of size is, next to the Paradise Glacier, the largest body of its class.

Summary and Conclusion. In making a careful study of the glaciers here described one cannot but be impressed by the fact that the summit of the mountain is not the source of all the "main" glaciers, but that cirques at relatively low altitudes give birth to a large percentage of them. Thus, of the five main glaciers here described, only two come from the summit and of these two, one, the Kautz Glacier is considerably inferior in volume to any of the cirque born glaciers. Of the entire set of eleven main glaciers of Mount Rainier, only six are summit born, to-wit, the Winthrop, Emmons, Ingraham-Cowlitz, Nisqually, Kautz and Tahoma, and five are cirque born, to-wit, the Wilson, Puyallup, Edmunds, Willis and Carbon.

The advantage of dropping the distinction between primary and secondary glaciers, on a basis of origin, is thus manifest. The real reason for abandoning Russell's system of primary and secondary ice streams, however, is of a more fundamental nature and requires further explanation.

Underlying Russell's system, evidently, is the idea that the summit regions because of their superior altitude constitute the chief gathering ground for snow, and that, therefore, they should normally feed the largest glaciers. The hollows in the interglacier tracts, on the other hand, because of their low altitude and relatively small capacity he held to be able to generate glaciers of subordinate importance only. Russell's climbs across the Winthrop and Emmons Glaciers no doubt served to impress him greatly with the vastness of these two summit

born ice streams. Interglacier, on the contrary, must have impressed him by its relative insignificance. It is easy to see how his intimate acquaintance with these glaciers on the north-east side of the mountain influenced him in the formulating of his scheme.

Had he been able to extend his investigations to the west side of the mountain, most probably he would have revised his views. He would have realized that the "Wedge" between the Winthrop and Emmons Glaciers is not really representative of the interglacier tracts on the other portions of the cone; indeed that it is merely an adventitious division point far down on the mountain flank, while the other great wedges all head high up, on the ancient crater rim, as they normally should on a volcano with the geological history of Mount Rainier. He would further have realized that on the extensive and deeply sculptured surfaces of such great wedges (as those culminating in Peak Success and Liberty Cap) there is abundant opportunity for the generation of large glaciers.

In Russell's days the manner in which cirques act as catchment basins for windblown snow was but dimly understood, nor was the rôle played by the wind in distributing the snows on mountains of great altitude fully appreciated. Yet that such is the case we now positively know. The cirques and other hollows on a peak like Mount Rainier fill with snow not as the result of simple vertical precipitation, but mainly through drifting under the influence of high winds. The ridges between the hollows after every storm are quickly bared, while in the wind sheltered depressions the snows accumulate to great depths. It is herein that lies the secret of the remarkable capacity that cirques possess for the collecting of névé and the generating of glaciers.

Had these things been clear to Russell, he never would have classed the Willis and Carbon Glaciers as primary, that is, as summit born glaciers. He classed them as such because he conceived them to be fed largely by avalanches from the summit névés. That they receive such avalanches is true enough, but these accretions are not to be regarded as constituting the glaciers' main source of supply. Large and imposing though the avalanches may seem, they probably are quite subordinate in volume to the snows gathered in the cirques by drifting.



LITTLE TAHOMA
P. M. McGregor

View of the rugged peaks from the divide between the
forks of the Fryling Pan glacier. July 30, 1912.

The enormous amphitheater for which the Carbon Glacier is noted, Russell thought of as a sequential feature, developed by the cascading ice, and now threatening by the continued recession of its head wall into the heart of the mountain to seriously curtail the supply of tributary summit névés. As a matter of fact the cirque constitutes the real generatrix of the ice stream, and the latter's fate does not at all hang upon the snow supply from above, as Russell thought. As long as the amphitheater catches a sufficient amount of wind blown snow the Carbon Glacier will continue to exist, even if the tributary névés on the summit were completely wiped out of existence.

The Willis Glacier is closely similar to its neighbor the Edmunds Glacier and requires no special explanation. Both ice streams as well as the Carbon must be classed as cirque born glaciers; the only difference between them lying in the vaster proportions of the Carbon's amphitheater, and these no doubt were determined by the superior size of the great hollow that originally existed in the mountain's north flank.

And now a word about another matter that even today is not generally understood. The precipitation on mountains of great elevation does not increase steadily upward all the way to the summit. As is well known to meteorologists the level of maximum precipitation is usually found at moderate altitudes, and therefore in many instances several thousand feet below the top. This is true also of Mount Rainier. The

heaviest snowfall on that peak probably occurs at levels between 8,000 and 11,000 feet. For it is between those levels that the moist air strata hang and that the great storm clouds habitually form. This in itself explains why so many of the mountain's glaciers and ice fields originate low down upon its flanks, mostly at levels below 11,000 feet. It also explains another fact, which must have struck more than one careful observer, namely, that so many glaciers have a length and volume wholly disproportionate to the limited capacity of their sources. And this characterization holds for cirque and summit born glaciers alike. One need but view the slender Kautz Glacier to feel at once convinced that the small initial supply which it draws from the summit névés is unable by itself to sustain an ice stream of so great length. The tributary it receives from Peak Success of course strengthens it considerably, but it is a notable fact that the glacier even before it receives this reinforcement appears larger than it was at the start. Obviously it receives accretions midway in its course, not only by precipitation but by drifting. The very size of its tributary suggests how considerable such accretions are likely to be.

Similar observations may be made on the other summit born glaciers, only in most cases the conditions will be found more complex than in the Kautz.

Especially striking is the downward enlargement of some of the cirque born glaciers, notably the Puyallup, Edmunds and Willis. Their beginnings are insignificant, yet each of these ice streams greatly augments in volume and in dimensions in its middle course.

Thus it appears that, after all, the mountain's flanks rather than its summit constitute the principal gathering ground of snow, and it is in that fact especially that we find warrant for placing all the large glaciers of Mount Rainier, whether cirque or summit born, on a parity with each other.

THE THERMAL CAVES

J. B. FLETT

In common with nearly all our volcanic peaks, Mount Tahoma has steam issuing from the crevices in the vicinity of the crater. This thermal region is not confined to the crevices bounded by the rim of the main crater, but extends outside of that circle and includes a small crater which lies west of the main one, together with additional territory to the north of both. Snow and ice have filled both craters nearly full. As the season advances this ice mass gradually settles down leaving a well defined rim ranging in height from twenty-five to one hundred feet. As the center is filled with ice to an unknown depth, no steam can force its way to the surface. The diameter of the large crater is about sixteen hundred feet. The circumference or region of thermal caves would therefore, if confined to the rim alone, extend about a mile in length. The large crater dips down toward the east. It is far from being level, while the small crater dips only a few degrees toward the west. The rims of the two craters meet at the dome of Columbia's Crest.

On the northwest slope of the small crater the steam has melted all the snow off so there can be no caves formed on the outside of the rim for the space of a quarter of a mile. There are, however, some excellent ones within the rim. All around the rim of the large crater are found large dome-shaped caves where the ice is melted by the slumbering heat beneath. As a party approaches the large crater from the south side, these caves are often a source of great danger unless the party is warned by some experienced leader or guide. Often there is only a thin shell of the roof left, through which the novice may fall to the depth below, either to get a very cold reception or a very warm one or perhaps both, depending on the nature of the cavity. When the crater rim is reached, the danger from caves is over so long as the party climbs over the rocks which form the rim. These caves do not extend far on the outside on the south. On the north side the heat is so intense that the

snow is melted off for a long distance down toward North Peak. When viewed from the prairies south of Spanaway Lake this region appears black in striking contrast to the spotless white of the surrounding part of the summit.

The hottest caves are found on the northeast slope of Crater Peak. In one of these ice-water was boiled in exactly three minutes. At times there are passageways for several hundred feet from one large dome-shaped chamber to another. In short, one can pick out a suite of steam-heated rooms adapted to his needs. This is fortunate, for the ascent from the east side is long and strenuous. Here a party can stop for refreshments. On our ascent of the mountain last summer warm drinks, bouillon, etc., were prepared in short order. There is usually a stream of water flowing through some part of the floor. Water also flows from some of the ridges on the roof in such quantity that a cupful can be obtained in a short time. It is folly to pack water up to the summit. It can always be procured in some of the caves if one understands the summit and where these caves are. There is one just east of Columbia's Crest down in the large crater where the writer has passed two nights. There is plenty of water flowing down the slope of the floor, which is rather steep at this point. One of our party had to go down into this cave for a distance of about eighty-five feet after an alpenstock that was accidentally knocked down and bounded into the darkness. We put a rope on the young man while he went after it. After he secured it he rolled stones down for a long distance. We could hear these plunge into a lake or pond. If this were not the real Styx it at least reminded us of the classical description.

There are no deleterious gases nor sulphurous odors connected with the steam issuing from this mountain. Both Mount Baker and Mount Adams belch forth poisonous gases of a sulphurous nature. None of the party felt any bad result from sleeping in these caves. The slope of the crater is always the floor. Sometimes this is so steep that one is liable to slide down, perhaps into the lake above referred to, or at least take several jolts over jagged cliffs which might have an injurious effect on his anatomy. In order to prevent this we drove an alpenstock through the thin shell of ice above the entrance and through into the slanting floor. Our rope was fastened to this. Then each man fastened himself to the rope. Strung out

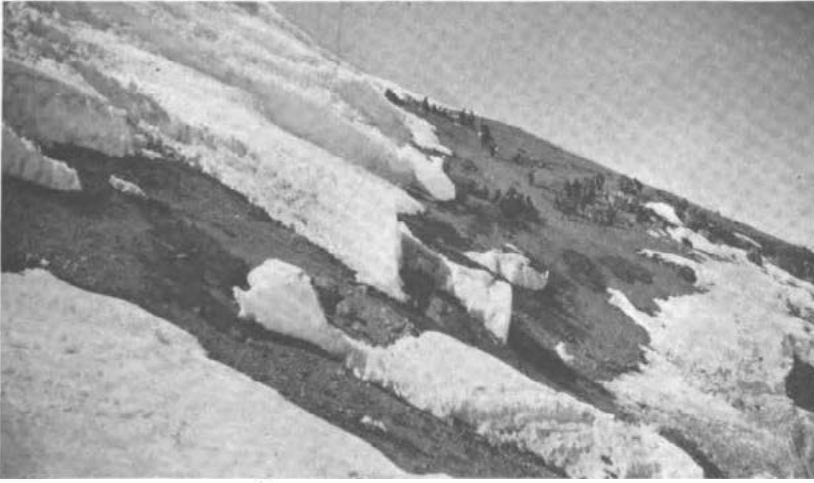
in this fashion we tried to sleep on the steep angle of the crater. Fortunately there were several large rocks above which we made our beds. We were careful not to push too much against these rocks for we were afraid that they might break loose. Bad as were these conditions the night was passed more comfortably than a night is spent at Camp Muir or Camp Curtis in a cold wind.

Strangers would not think that the small openings under the crust of snow or ice could lead into such large chambers within which several hundred people could find warmth and shelter. At times the roofs of these caves must collapse to the floor, just as the ice caves do where the water rushes out of the end of a glacier. This uncertainty makes a man feel rather uncomfortable when he realizes what might drop on him while he is within. The steam comes quite fast, at fixed intervals like the breathing of a large animal. The steepness of the slope, the danger of collapse, the puffing of the steam, the pitch darkness, and the general hell-like surroundings all taken together make indeed a novel situation which one will remember for a long time.

Near these caves are several kinds of moss and the common liverwort (*Marchantia polymorpha*). These have never been observed in the fruiting condition.

These thermal caves formed between the ice and the crater rim or on the slope of Crater Peak must not be confused with the lava caves which are so common to the south of Mount Adams. The cause of their formation is entirely different. There are no lava caves in the vicinity of this mountain. They are caused by the cooling of the outer surface into a crust while the inner portion remains liquid and flows on, leaving an empty shell often half a mile or more in length. They are more permanent than the thermal caves which have only ice for a roof. These thermal caves vary as the snow varies from year to year. They can only be formed where the steam issues forth and the snow accumulates in such quantity as to form ice.

Plate XVI.



INNER SLOPE OF THE CRATER MELTED BARE OF SNOW BY STEAM

Plate XVII.



A. H. Barnes
SHOWING WHAT IS BELIEVED TO BE STEAM ISSUING FROM THE DARK CAVITY
UNDER WILLIS WALL OF MT. RAINIER

CHANGE IN WILLIS WALL

J. B. FLETT

About eighteen years ago the writer visited the vicinity of Willis Wall in an attempt to find a route around the east side of the mountain. The weather was quite foggy in the early part of the day, but about noon the clouds began to break away. As we approached the Carbon Glacier from Spray Park the fog cleared away from the base of the mountain and revealed Willis Wall in all its rugged grandeur, while in front and below us the Carbon Valley was full of fog. It appeared like a body of water. We cautiously approached the edge of the precipitous bank above the glacier and rolled stones down for we could not see the bottom. We judged from the distance the stones rolled and the way they crashed and bounded from cliff to cliff that we did not wish to descend at that high altitude.

While we were deliberating on the next move, a huge avalanche came from the top of Willis Wall and bounded from cliff to cliff as it made its rapid descent in the form of a massive cumulus cloud. When it reached the upper end of the glacier the cloud-like appearance ceased. It then came tearing down the steep slope of the glacier presenting the appearance of a train of cars as the snow and ice were ground into dust-like particles which rose like smoke and steam from a locomotive. At that time the slope of the mountain was much more gradual near the lower part of the wall, so that the avalanche moved down for a long distance before it finally came to rest. The vast mass of ice falling for more than three thousand feet, grinding and abrading the rocks, has wrought great changes on this slope, so that now Willis Wall presents a hollow circular appearance which is dark during the early part of the forenoon.

Some observers have thought that great changes have taken place quite recently and that volcanic action has been in some measure responsible. Several parties have observed steam issuing from crevices in this dark circular portion already referred to. Our party this summer saw it very plainly and

took several photographs of the condensed vapors, for which see accompanying illustration.

Some of the members of Major Ingraham's party called our attention to this phenomenon as we passed through Spray Park. When we reached this side of the mountain the next day, we witnessed a fine exhibition of steam curling up and down, to and fro, over the face of Willis Wall. Its center of activity seemed to be about half way up the slope and well over toward the Avalanche Camp side. There were several other places below where the vapors appeared to be pouring forth. We resolved at once to go up and investigate as near as the avalanches would permit. As the sun rose and lighted up this dark cavity toward noon, the steam began to vanish. We reached the steep slope of the mountain about noon. At that time there was no apparent steam. We rested for an hour with cameras ready for the avalanche that did not fall. We then concluded that the vapor was caused by the currents of cold air from this dark cavity coming in contact with the warm air from the outside. The more we think of it the more we are convinced that our conclusion was rather hastily formed. The steam appeared so real from our camp at an altitude of about 5,500 feet that a more thorough investigation is really necessary to get at the truth. No one would dare to attempt to reach the apparent source of activity. From Avalanche Camp or from the glacier below, valuable observations could be made to determine whether this is steam or the warm and cold currents coming together.

The shape of the cavity and the enormous amount of rock material on the glacier would seem to indicate that something unusual had taken place. The hollow cavity could hardly be formed by the avalanche. The writer has crossed this glacier many times, but has never before seen anything like the amount of moraine material that there is at the present time. The glacier is simply loaded with débris from twenty to fifty feet high for its entire width.

The hottest part of the summit is on the north slope of the crater down toward North Peak. This fact, too, points to a possible slight eruption on Willis Wall or issuing of steam therefrom. Tourists to the north side of the mountain should make a careful study of this region to ascertain the truth.

Careful observations for a period of a week or two would do much to solve this problem.

When the atmospheric conditions are just right, steam can be seen plainly on the summit. At other times the steam can not be seen at all unless one is very close to the place where it is issuing forth, so will it be in the case of Willis Wall.



Sunset from Camp Curtis

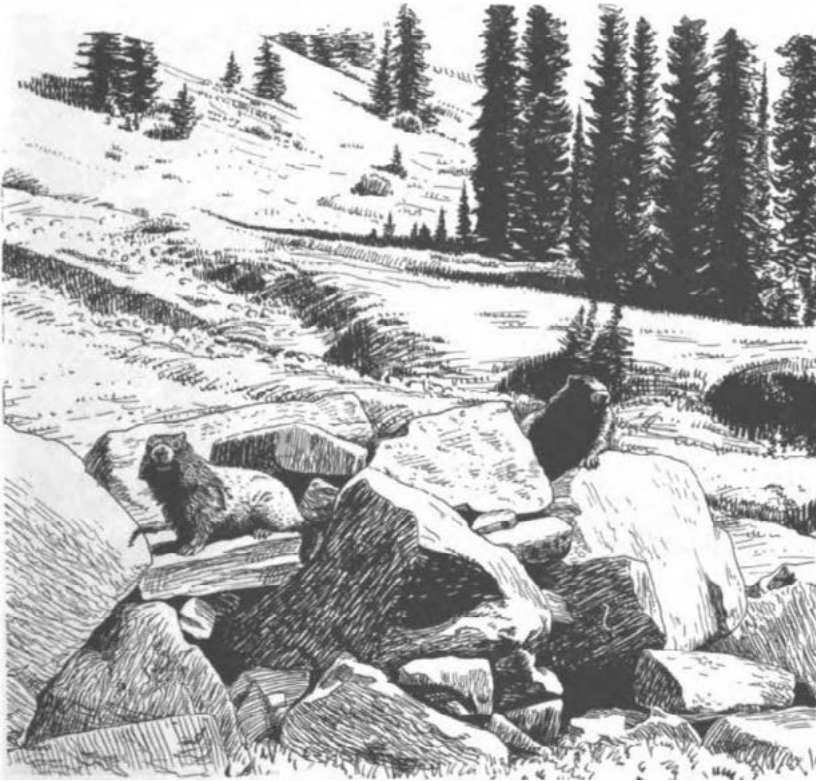
H. B. Hiseman

THE WHISTLING MARMOT

TREVOR KINCAID

To one unaccustomed to mountain slopes and the peculiar life associated with the world above timber line, the manner in which the marmot introduces himself to strangers is both startling and pleasing. When the amateur mountaineer, leaving his human associates far below in the valley, toils upward above the limit of tree growth and emerges into the vast solitude of cloud-swept steeps, he feels far removed from others of his kind. Suddenly a shrill, buoyant whistle breaks upon his ear, and he is startled to think that the seeming waste of rock and moss is tenanted by man, and by youthful members of the species at that! When, however, he searches for the author of the flute-like cadence he is astonished to find the musician is not a biped but a four-footed mountaineer, clad in a warm furry coat to meet the exigencies of his alpine domicile. Familiarity with this fur-clad flutist does not breed contempt, but leads us to appreciate more fully the picturesque qualities of this dweller upon the lofty places of the earth.

The marmot belongs to the extensive order of mammals, named in accordance with their universal gnawing propensities, the *Rodentia*, a group which includes the rats, hares, squirrels, beavers, etc. Tracing the family tree of our whistling friend a little farther, we find that zoologists classify him in the same family with the squirrel, chipmunk and ground-hog, viz., the *Sciuridae*. One more climb into the genealogical arbor and we find that our local alpine marmot belongs to the genus *Marmota*, and his full name when he is on dress parade in a museum, is *Marmota caligata*, this designation having been applied to the animal by Eschscholz in 1829. In some accounts of the species he travels under the alias of *Arctomys pruinosus*. The common names that have been used in describing the animal are also somewhat varied, such as, whistler, whistling marmot, hoary marmot, gray marmot, alpine marmot, etc. In early days the Canadian fur traders called the creature, *siffleur*. The word marmot is derived from the French, *marmotte*, and this by a



The Whistling Marmot. Pen and ink rendering from a photograph taken in Buck Creek Pass

roundabout route through the Italian from the Latin *mus montanus*, or mountain mouse.

Ten species of marmot are known to exist in the northern hemisphere, two being found in Europe, three in America and five in Asia. The alpine marmot of Europe has been known for generations to the mountaineers of the Old World. It resembles very closely our American whistling marmot and its habits are quite similar. The long-tailed marmot of the Himalayas (*Marmota caudatus*) is another close relative. The groundhog of lower altitudes is a cousin, zoologically speaking, of the marmot, while the prairie-dog is a sort of second cousin, since he belongs to another but closely allied genus, *Cynomys*. The bobac of the Asiatic plains is another kinsman of the marmot tribe.

Unlike their near relatives, the squirrels, the marmots do not possess cheek pouches for the temporary storage of food,



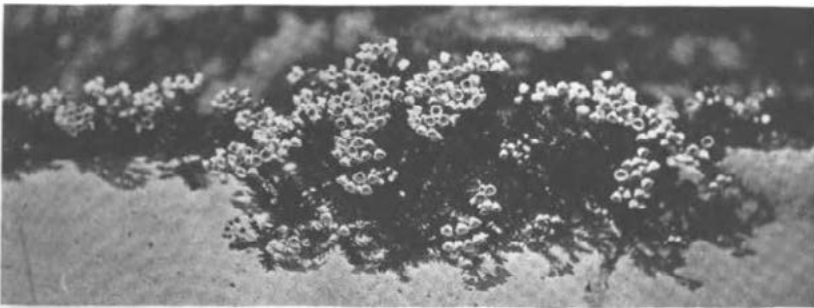
The habitat of the Marmot is from the Columbia River far into Alaska and from the Pacific to Hudson Bay

but on the other hand they are characterized by the peculiar formation of the fore limbs, since the thumb is reduced to a mere rudiment and is provided with a peculiar flat nail. The body of the animal is nearly two feet in length with a tail about six inches long. The color is grizzly gray with some dark markings. The home of the local species is in the region extending from the Columbia River to beyond 60° north latitude, and eastward to Hudson Bay. An allied species, the yellow-bellied marmot (*Marmota flaviventris*) is found in the southern portion of the continent, from Texas to California and New Mexico. The marmot of the Olympic Peninsula is by some authors regarded as a distinct species, since it differs from its relative of the Cascades in certain minor characteristics, but it is usually regarded as a mere variety of the more widely ranging species.

The habits of the marmot, aside from its unusual whistling powers, are similar to those of related burrowing rodents. The tunnel made by the animal extends for some distance among the crevices of the rocks in the midst of which it makes its home,

and it retires when alarmed to an inner chamber where it remains safely ensconced till all danger has gone by, or till such time as curiosity gets the better of its judgment. Since the animals are of a social disposition, small settlements are established in favorable situations. As befits good citizens each marmot is zealous for the common welfare and stands ready at an instant's notice to signal the approach of danger to his fellow townsmen. Once the tocsin has sounded all are upon the qui vive till careful investigation has disclosed the cause of the alarm.

Roots, leaves, and insects constitute the principal food of the marmot; these the animal is able to secure without wandering far from its burrow. On the approach of winter the beasts retire to the inner recesses of their cavernous dwellings and go to sleep. They do not awaken till the returning summer brings to them the growths of vegetation which follow so closely the retreating snow-line. Some slight provision is, however, made for tiding over an inclement season since one chamber of the burrow is filled with dried grass before the creature goes to sleep in the fall. With the dawn of a new season the marmot awakens from his slumber and stands ready to give his buoyant greeting to friend and foe alike, as the life of the mountain is released from the icy grip of winter.



HEATHER

C. R. Corey

KNAPSACKING IN THE HIGH SIERRAS

R. L. GLISAN*

The most attractive feature of the Sierra Club outings in California is the knapsack trips.

On the 27th of June, 1912, about 185 Sierra Club members left Springville in Tulare county, California, on their annual outing. Tramping easterly up the Tule river across to the Kern and northerly up the wonderful canyon of the Kern almost its entire length, swinging eastward again we crossed the Sierras, ending a month of scenic ecstasy by dropping over 7000 feet in one day from the high mountains to the desert on the shore of Owens lake, where we caught our special homeward bound.

To describe the entire outing would take too much space, but it may be possible, with some regard for brevity, to describe one of the knapsack trips.

On July 11th a knapsack party left the main camp at Moraine Lake on Chagoopa plateau above the Kern. The party consisted of a member of the Outing Committee and his wife, five other club members, a Mountaineer, and a Mazama, four ladies and five men, all having had knapsacking experience.

The previous evening the provisions were weighed, put in small bags, labelled, and apportioned. Canned goods and bulky articles were discarded as far as possible, preference being given to powdered milk, soup tablets, and hard-tack, while eider-down sleeping bags were taken instead of blankets. The allotted packages were placed in respective sleeping bags, rolled and strapped in special harness designed by a club member. Personally I preferred a specially arranged sleeveless hunting coat, carrying my sleeping bag in a small compact roll. The total individual equipment weighed from twenty to thirty-five pounds, cameras, fishing rods and tackle helping to make the greater weight. Each morning the provisions were reapportioned, making due allowance for amount already consumed.

*Mr. Glisan is one of the foremost mountaineers of the Pacific Coast. He is a member of the Sierra Club of California, the Alpine Club of Canada, and ex-president of the Mazamas of Portland.

Leaving Moraine Lake we crossed the Chagoopa plateau to the rim of the Big Arroyo Canyon and after several attempts, finally selected the head of a ravine where a dry water course furnished stepping stones and scattered pines below gave fair assurance that the descent would not be too abrupt on the lower slopes. On the plateau above, mountain bluebirds flitted across our path and near the rim we noticed wolf or coyote tracks, no doubt made by the "invisible choir" in the timber the evening before. On the way down we heard grouse call and on a projecting point we found curved mountain sheep horns, mute evidence that our route had been favored by that monarch of all mountain climbers. A descent of 1500 feet brought us to the Big Arroyo, with our packs by that time tested and adjusted as from then on to be like part of our own anatomy.

Going up stream we forded near Lost Creek and while some rested under the pines, others prepared fire, and the three anglers hastily putting their rods together whipped the near by pools, each securing in less than an hour twenty or more trout. The trout were marvels of beauty, for here the rainbow of the Kern and the trout of Golden Trout Creek had intermingled creating a kaleidoscope of color, varying in shade as they came from sunny riffles over yellow granite or kept more secluded in dark pools. Probably you all know the rainbow, but the golden trout is only found in the creek of that name, a tributary of the Kern, and in several near by streams and lakes where they have been transplanted by the Sierra Club. Carrying fifty or more trout on various occasions, in fish cans, on mule back, for several days at a time, the club has achieved remarkable success. One hundred, planted five years ago, increased so amazingly that thirty anglers securing the limit of twenty each in Rock Creek one day made no appreciable difference in the number of its finny inhabitants. To appreciate their wonderful coloring one has to see the golden trout as it darts, a blaze of gold, from its hiding place under bank or boulder for the fly; or caught, lies gasping on the green sward showing the brilliant gold underneath, with sides of paler hue divided by a horizontal band with dark back and strongly marked dots on fin and tail. The largest golden trout caught during the outing weighed three and one-half pounds and the record rainbow eight and three-quarter pounds, both caught in lakes stocked five and seven years before. The trout in the streams were smaller but better fighters and more attractive flavor.

But I am widely digressing—leaving the Big Arroyo we took the dim zigzag up Lost Creek, so called because the creek slips so inconspicuously down the canyon wall that many seeking Lost Creek have followed up Soda Creek, its more pretentious rival.

Pausing here and there under the cooling shade of some isolated pine, to glance backward at the widening view, we soon entered clumps of timber interspersed with little glades, where dodocatheon and other dainty dabs of color blossomed on the green turf edging the tumultuous stream. Near the trail we passed a camp-fire and paused to glance at a bear cub tied by a halter rope with a hobble for a collar. The cub, terrified, climbed up the hunter's coat and whimpering, clasped him by the neck, and for want of better shelter buried his head against the hunter's broad shoulder, a large skin stretched near by pathetically demonstrating why the cub's mother did not offer the desired protection.

Late in the afternoon we made camp in the tamrac pine at 10,500 feet elevation, and after bath and supper drew close to the genial rays of the camp-fire on the ledge, the wall of rock reflecting the heat and offering support for tired limbs.

In the morning the men rose with the dawn and soon had breakfast sufficiently advanced to warrant calling the ladies. Where the ladies had selected sleeping quarters a self appointed committee of three solemn looking mules were seen, with long ears forward, immovable as statues, gazing at the strange mummy-like sleeping bags, hidden from us, but detected by them, as foraging they had wandered up the glade from the hunter's camp below. A call from us produced mutual consternation, as fair heads emerged from dunnage bags and met the downward stoical glance of the inquisitive intruder.

Breakfast over we followed up the creek. Tamrac gave way to scattered Japanese-looking foxtail pine, whose clustered tips like fox tails extended on twisted limbs from dark brown trunks, and polished golden brown dead branches and stems rose above the green boughs, offering an effective contrast to the huge white granite boulders, erratic—left by a retreating glacier ages ago.

Halting at Columbine Lake to absorb the reflection of Sawtooth lifting its jagged crest like a shark's tooth ripping the heaven above, we slowly worked up the steep slope and at last made the huge slab which formed the summit, 12,340 feet.



**VIEW FROM
SUMMIT OF
SAWTOOTH MT.
E. L. Gilsan**

Showing the Mt. Whitney group on the horizon with a gathering storm, and sunshine in foreground. Mt. Whitney is 14,502 feet high and Sawtooth Mt. is 12,300 feet in altitude.

The view from Sawtooth was superb, a wonderful panorama of the High Sierras. To the north we caught glimpses of the peaks guarding the Kings River Canyon, which cuts westerly through the Sierra range. Just below the King we could trace the Kern on its journey south dividing the Sierras into two great ranges, the Kaweahs rising on the western range and Whitney, Williamson, and Langley on the east, each over 14,000 feet, but such close rivals that no one peak was conspicuous above its neighbors and yet all lifted above the desert to the east as to give one an overwhelming sensation of height and grandeur as we gazed from the summit of one or the other later in the outing. To the southwest lay the San Joaquin valley with the hazy blue coast range beyond and at the head of a valley just below, we could recognize the mining camp of Mineral King.

A thunder storm driving toward us across the Kern made the scene more impressive and us more uneasy, as on these peaks of exposed rock the air becomes so surcharged with electricity during a storm that often electric sparks will flash from finger tips as the climber reaches for some handhold.

We made the descent by a different route taking us down to a saddle above the lake and then down a steep snow slope, the latter more of a novelty to the Californians than to the representatives from the north.

Returning to camp we crossed the western ridge and descended into the Five Lake basin, selecting camp among the pines on the shore of the Middle Lake, where sunset and sunrise, mountains and clouds were so clearly reflected as to puzzle one to trace the dividing line.

The next morning we were up as "rosy fingered dawn" bathed the high peaks with silver light long before the sun could pour its golden rays down where we were hidden. It was a morning of surprises. We explored the basin and the basins further west. We fancied each a gallery, the lakes paintings, the supreme effort of world renowned artists, and we the committee to award the prize. Some lakes had bands of green, dotted with flowers of brilliant hues; some had talus of granite or sloping sides polished by ancient glaciers. Others were encircled with tall tamrac or again with fantastic foxtail pine. Banks of snow formed the edge, or perpendicular walls rose

sheer above. In sunlight or deep shadow the water varied from light blue to deepest indigo.

In one glade we startled a horse which, wilder than a deer, dashed away and at a safe distance half-circled, with arched neck, flowing mane and tail, curious but cautious. We wished in some way we could warn him of the winter snows to follow the Indian summer, when he would repent deserting the unfortunate who had brought him into the high places.

Towards midday we reluctantly left the lake basins and following down what in spring was a boisterous cascade, in summer a stone stairway, we again made the Big Arroyo farther up than the ford we crossed the first day. Here the fishing was even better than below, and enough trout were soon caught for lunch. The anglers lingered while the others pushed on up stream and made camp in the last fringe of timber at the head of the canyon, 11,000 feet elevation. The anglers soon followed, having easily caught the more generous limit allowed here of fifty trout each, although handicapped by their packs. Trout left over were taken to the next camp, our decreasing provisions making their weight less noticeable.

The following morning we went through the Nine Lake basin in search of the pass. Our compass and map designated a slight sag in the rim just above, although tempting defiles shadowed by high walls lay on either side. Several of the party reconnoitered to the right, while others made for the rim in front, which proved correct as the pass to the right led into another watershed. Taking heavy packs over a 12,000 foot pass, up shifting rock and down a corrugated snow slope, was a severe test, but no one flinched and soon we were in the amphitheatre or cirque at the head of the Kern-Kaweah and after noon we made camp where the creek from Milestone came cascading down the canyon wall.

The following morning we went up the creek to Colby Pass, named for the Sierra Club secretary who had discovered this, the only feasible route for a future pack animal trail connecting the two great canyons of the King and Kern. Below the Pass to the north lay the small lakes at the head of Roaring River.

Following up the ridge to the east, keeping close to the edge where we could look down perpendicular walls with spires and minarets of thinly weathered rock jutting out and forming

vistas of valleys far below, we came to Milestone Bow with Milestone opposite, a shaft with squared edges suggestive of a monument raised by some fabled giant.

Returning we again lifted our packs and followed down the Kern-Kaweah and lest we lose any of its increasing grandeur, a mile above the Kern where the apology of a trail disappeared over a projecting point, we kept the water's edge, climbing over slippery boulders, squirming around wet walls, or fighting brush, rewarded by the mad rush of water deep set in high canyon walls. Tired we made the main camp, where the Kern-Kaweah takes its last plunge into the Kern below, thus ending a knapsack trip I defy any one to equal.



PTARMAGIN
C. R. Carey

LOCAL WALKS

WINONA BAILEY

No small part of the activity of the Mountaineers' club is spent on local walks. In Seattle during the year beginning December, 1911, thirty-six walks were successfully conducted by the committee in charge, twenty-three on Sunday and thirteen on Saturday. The average Sunday walk took all day for a distance of about ten miles. Some of the Saturday walks were for the afternoon only, occasionally arranged to close with a big dinner at some country inn, where quality of food and good company attracted many, whose work prevented participation in the walk earlier in the day.

The spring walks closed in June with a big reunion, clam-bake, and camp-fire on Blake Island, the home of Mr. and Mrs. William Pitt Trimble.

The numerous street car lines running out of Seattle and its matchless water ways, including Lake and Sound, give opportunity for endless variety in the selection of route and objective point. About once a month a chartered steamer has carried from one hundred to two hundred people across the Sound to some otherwise inaccessible spot, and waited to bring them back in the evening. Sometimes the regular boat has been used, occasionally the railroad. Trips across or around Lake Washington alternate with Sound and Interurban trips. The region covered extends from Tulalip reservation near Everett on the north to the prairies south of Tacoma, from Bothell to Renton in the lake district and west into Kitsap county and across to Hood's Canal. The vast territory accessible and the constantly increasing number of roads and trails make it seldom necessary to repeat a walk entirely.

There have been six joint walks with the Everett members, often planned so that the parties met midway on the Interurban; and in May when the violets were in bloom everyone joined gladly with Tacoma walkers.

The extra strenuous have had two opportunities to test muscle and endurance, one for twenty-two miles to Renton by

way of Lake Sammamish; the other for thirty miles from Everett to Seattle.

The Everett branch has conducted twenty-two walks radiating from Everett in every direction and similar in their variety to those of the older club.

In April the Tacoma members began to announce local walks in the Bulletin and since that time have taken ten one-day trips.

The local walks committee has also planned and carried out two most successful and enjoyable three-day trips, one in September known as the Labor Day trip, by chartered steamer to the beautiful San Juan islands, a trip now becoming a kind of annual pilgrimage to Mt. Constitution and Rosario, the home of Mr. Robert Moran; the other a glorious midwinter frolic in the snow at Index, the gateway of the Cascades. Besides this the Everett club managed a three days' outing the last of May to Mt. Index and took eighteen people to the top of West Index. The Tacoma club took twenty people in June on a rare scenic trip to the top of Beljica peak near Mt. Rainier, a most appropriate preliminary for the summer outing on the higher mountain.



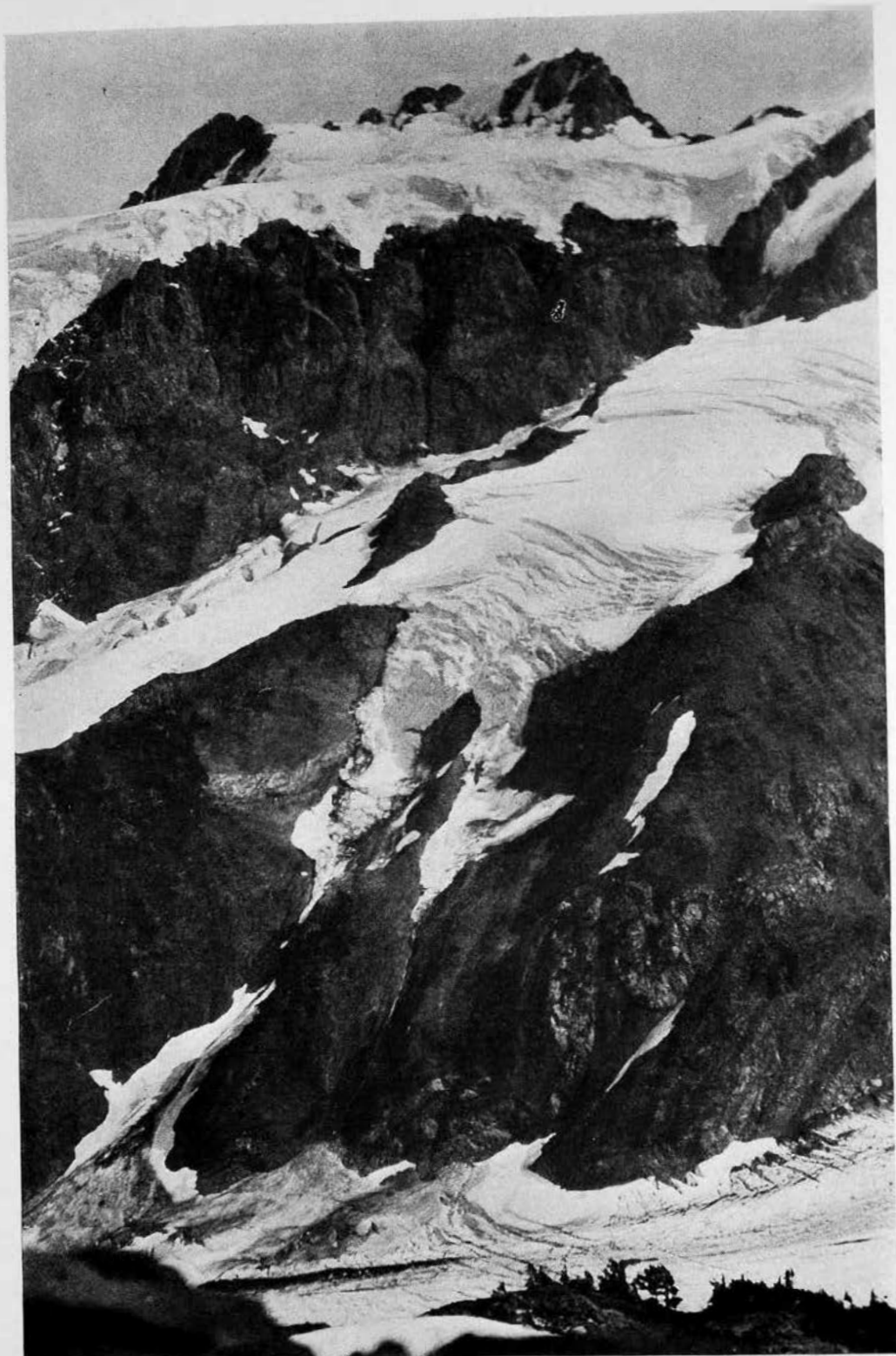
PTARMAGIN EGGS

A. B. D.



**"WINTHROP GLACIER.
FROM THE TRAIL TO
GRAND PARK"**
Copyright, A. H. Denman

Showing in the distance the Winthrop glacier, Willis Wall, and the head of the Carbon glacier. The Winthrop river and its canyon, 3000 feet below this point of view, is in the foreground. Aug. 3, 1912.



OLYMPUS FROM
THE NORTH—
Copyright by
Earl Rice

Showing a side rarely if ever climbed, being the side opposite the route of the 1913 Outing. Taken from an elevation of 6000 feet and at a distance of about two miles looking across the largest glacier flowing from Olympus. The edges of this unnamed glacier shows in the lower right foreground. Aug. 13, 1912.



**THE QUEETS
VALLEY—
Das. Albertson**

Looking down the valley of the Queets river toward the Pacific ocean, being one of many such Olympic vistas. This is taken from the proposed site of Permanent Camp, Outing 1913, and is located among the head waters in the park country.



THE QUICK AND THE DEAD

P. M. McGregor



MT. OLYMPUS FROM
BLIZZARD PASS
Chas. Albertson

Distant about two miles and 8250 feet high. East and Middle peaks, seemingly one, though a half mile apart, show close together as the high point. The West peak, two miles farther on, appears lower and at the right. The climb during the Outing of 1913 will be made up the Hoh glacier in the foreground and along the left sky line.



BERGSCHRUND—
At Head of
Winthrop-White Glaciers
H. V. Abel

This was of great height and formed the chief obstacle to the ascent. The crossing was made by following along the lower lip to and up a dangerous ice bridge to the cornice above. This elevation is fully 14,000 feet and is located just below the saddle between Columbia Crest and Liberty Cap.



XEROPHYLLUM TENAX
Mabel Furry

Indian Basket grass, or Squaw grass, found in high altitudes and used by the Indians in their basketry.

NOTES OF OTHER CLUBS

EDITED BY A. H. ALBERTSON

Mazama The following is quoted from the 1912 Mazama: "The annual encampment at Mount Hood from July 15 to 29, 1912, is to be included among the best of the 19 annual outings conducted by the Mazamas since the organization of the club. The camp was located a short distance from Cloud Cap Inn, in a grove of sub-alpine trees and convenient to the mountain. The largest number of people in camp at one time was 125. The official climb on July 22 was participated in by 65 persons, who were joined on the summit by a large party of climbers from the south side of the mountain, conducted by the Portland Y. M. C. A. * * * An edition devoted to the Mount Hood outing and the St. Helens outing of 1908 is in course of preparation. It is expected that this number will be issued early in 1913."

Rocky Mountain Climbers The club planned for this year a program of tramping which covered the last fourteen days in August. One hundred men and women, including residents of sixteen states of the Union, took part. The trip was leisurely, not more than thirteen miles being covered in one day, the dunnage being carried by wagons. Two main trips were taken. The first was from Camp Arapahoe, on the side of the Arapahoe Peak, to Arapahoe glacier. This took two days. During this trip the corner-stone of the Rocky Mountain Climbers' cottage was laid. This cottage is the first in a chain to be erected throughout the mountains of Colorado.

The second main trip was from Arapahoe Peak to the top of Bald Mountain by way of Silver Lake and Camp Albion. After climbing Mt. Audubon the party went to Ward by way of Stapp's Lake and Beaver Park. Long's Peak was also climbed.

The Rocky Mountain Climbers have been in existence six years and have about two hundred members. It is incorporated. The officers are E. G. Fine, president; John R. Bell, vice-president; W. H. Laney, treasurer.

Colorado Mountain Club This club was organized in Denver in April, 1912. The regular schedule of local walks was carried out during the summer ending with their first annual outing on Mt. Evans. The outings of this club are similar to those of The Mountaineers. Mr. James Grafton Rogers is president and Miss Mary S. Sabin is secretary. The Mountaineer welcomes this new club of the out-of-doors.

**The Alpine Club
of Canada**

The main camp of the annual summer outing of the Alpine Club of Canada was pitched at Vermillion Pass, 5300 feet above sea level. The camp lasted from July 31st to August 11th.

Vermillion Pass is about seventeen miles west of Banff by railroad and eight miles from Castle Station—seven being by road and one by trail. There were about one hundred in camp on August 1st, all told there were one hundred and sixty-eight. The camp-fires and Sunday services are very similar in general character to those held by The Mountaineers.

It will be remembered that the Alpine Club of Canada requires its applicants for membership to climb some mountain before being accepted as members. This year there were fifty-three who qualified for membership. Applicants having accomplished the required climbs are referred to as being graduated, and the climbs are spoken of as being graduating climbs. These graduating climbs are very much like the "try-out" trips of The Mountaineers and constitute one of the main activities of the club at their main camp. In addition to these graduating climbs a number of other trips were carried out. A trout fishing expedition was made to upper Vermillion Lake. The ascent of Mt. Whymper was made and a two-days' trip to Prospectors' Valley; a climb of Ten Peaks Valley and a three-days' climb to Mt. Ball.

The Alpine Club holds its annual meeting and election of officers during the progress of its annual outing.

Among the guests were four members of the Appalachian Club.

**The American
Alpine Club**

The objects of the American Alpine Club are primarily scientific. No definite walks or outings are arranged. The by-laws state that the main purpose is the study of the high mountains of America and the publication of monographs of these mountains through the medium of their own publication, *Alpina Americana*. Monographs of a number of mountain subjects have already been published. The membership is composed largely of scientific men and experienced mountain climbers. The club has no definite headquarters, meetings being held in convenient cities on the Atlantic Coast.

**Sierra Club
Outing, 1912**

The Sierra Club held its summer outing of 1912 in the Kern River Canyon, entering the Sierras from Springville and going eastward to Lloyd meadows through a beautiful grove of sequoias; thence in a northerly direction through the magnificent Kern Canyon to the junction of the Kern and Kern-Kaweah rivers. From the Kern Canyon a détour was made into Long Meadow, where the streams abound in golden trout. The Sierra Club as is their custom stocked several lakes and streams with small trout. From the junction of the Kern and Kern-Kaweah the party proceeded southeast to Crabtree Meadows, from which Mt. Whitney was climbed and then on over Army Pass (12,000 ft.) to Cottonwood Lakes and on down Cottonwood Creek to the desert near Owens Lake.

The main party covered a distance of about one hundred and fifty miles, although many smaller divisions made additional side trips. The party numbered two hundred people and besides Californians included representatives from Canada, Oregon, Washington, the Atlantic Coast, Honolulu and Europe. Ascents by various members of the party included the south Kaweah (13,816 ft.), Sawtooth Mt. (12,300 ft.), Milestone Mt. (13,643 ft.), Mt. Tyndall (14,025 ft.), Mt. Guyot (12,300 ft.), Mt. Williamson (14,384 ft.), Mt. Whitney (14,502 ft.).

SCIENTIFIC NOTES

EDITED BY GERTRUDE STREATOR

For several years various members of the Mountaineers have collected insects for Prof. O. B. Johnson, Professor Emeritus of the University of Washington. This is splendid work for the club members and Professor Johnson's appreciation is expressed in the following letter received this fall:

"To the members of The Mountaineers.

I am writing this to express my thanks for the kindly interest taken by the members of your club in collecting insects to be sent to me. These arrived in due time in good condition. Many of them were especially desirable and two or three were new. Coleopterists are fortunate in having the services of the Mountaineers, as they reach unusual altitudes, and many of the problems of distribution, etc., have to do with what is called the glacial edge or ice pack, those ravellings of the old glacial era that are left on the perpetually snow-capped mountains. Few of us "beetle enthusiasts" have facilities for going to those places that your club is organized for. So I repeat it is fortunate to have such an ally.

The group of beetles that is just now holding interest is the *Cocnus Nebria*. Of the twenty-seven species found in the United States, fifteen of them occur in Washington and five of them were described as new in the last five years. There are undoubtedly others yet to be "discovered" in the peaks to the north of Glacier Peak and the mountains north of Spokane.

One of our most exciting surprises came in the collection made on the Glacier Peak trip. Three examples of *Pterostichus* were decidedly new and so were submitted to Dr. Van Dyke of San Francisco, who says in part, 'The species of *Pterostichus* sent is one that has long been misunderstood and has many pages written about what it was and what it was not. I was about convinced that it was a new species when suddenly a glimmer of light appeared. As a result I succeeded in definitely placing it. In other words your specimens are the long-lost, the long-overlooked, unrecognized and misunderstood *Pterostichus brunneus*.' It will now be restored to the check list.

This is but a hint of what may be done for this one branch of science. I had expected to send a list of species collected on the three trips, 1910, 1911, 1912, but it just strikes me that a bare list of the names will not appeal very strongly to a novice, and so I have resolved

to prepare examples of each of the species captured for the purpose of illustrating the label. They are in a glass-covered box and can easily be referred to 'at home' with no danger of breakage in passing around.

Cordially,

O. B. JOHNSON."

The collection of fifty specimens was delivered to the club and is in the custody of the Historian, where it may be studied by anyone interested. The collection is a very valuable addition to the club properties and it is hoped will form a nucleus for a permanent exhibit of scientific interest.



Rainiera stricta, a plant belonging to the composite family, was found on the 1912 outing growing in abundance all the way from the Manastash ridge to the slopes of Mt. Rainier. This plant bearing the name of the great mountain had previously been reported only from the mountain itself or the region directly south.

Mr. E. B. Webster, editor of the Olympic Leader, who was a member of the Mountaineers' first annual outing, has the honor of adding one to the list of plants known to grow in the state of Washington. The new plant belongs to the composite family and has been named *Senecio Websteri* by Mr. C. V. Piper, government agrostologist and author of "The flora of Washington." WINONA BAILEY.



Lake Sammamish is situated several miles east of Seattle. The submerged forest in this lake has an area of about fifty acres and it is near the west side, not far from the head of the lake. The broken-off tops of the trees are awash at summer level of the lake. This fall the lake has been lower than ever, the tops being about four feet out of water. Most of the trees stand nearly vertical, a few are considerably inclined. The size of trunks at water surface ranges from about eight inches to three and a half feet in diameter. The trees are of the usual forest variety of this region.

Forty-eight years ago, Mr. C. B. Bagley of Seattle first saw these trees while on a canoe trip. He found it troublesome to paddle through them. At that time the broken tops extended high above the water for varying lengths. His impression was that they then had been submerged perhaps forty or fifty years.

Apparently this phenomenon is not the result of a slide from any adjacent high steep ground. The nearest shore land is rather flat and gently sloping for a good distance from the lake. It is possible, however, that a precipitous side of a deep channel gave way, causing a slide. A sudden damming of the lake is improbable, as the formation at outlet does not indicate it, nor do the shores of the rest of the lake. A subsidence of the ground seems to be a probable cause, but what caused the subsidence is not apparent.

R. H. McKEE.

THE MOUNTAINEERS

DIRECTORS FOR THE YEAR 1912-13

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Charles Albertson.....	1616 Nob Hill Avenue
Roy Hurd.....	1522 6th Avenue
Dr. H. B. Hinman.....	2605 Baker Avenue, Everett, Wash.
L. A. Nelson.....	1616 Nob Hill Avenue

MONTHLY MEETINGS OF 1912

January 19, 1912. Prof. J. B. Flett of Tacoma told the fascinating story of his great trip last summer in which he traveled completely around the mountain. The lecture was illustrated by numerous lantern slides.

February 16, 1912. Mr. Bert P. Kirkland, Supervisor of the Forest Service of the United States Department of Agriculture, addressed the club upon "The Forest Service."

March 15, 1912. Mr. W. A. Ross, Assistant General Passenger Agent of the Great Northern Railway, gave an interesting illustrated lecture on the wonderful beauties of Glacier National Park, Montana.

April 19, 1912. Captain James V. Martin, who after nine years' experience upon the sea abandoned the limited oceans of water for the unlimited oceans of air, gave an illustrated lecture entitled the "History and Progress of Aviation." His comparison of the depth, density, and motion of the water with that of the air served as a basis for his later comparison of seafaring boats with air-ships.

May 17, 1912. Slides of the local walks. Messrs. Gleason and Cruse furnished one of the most enjoyable entertainments of the year when they so kindly exhibited the slides prepared from the pictures taken on the local walks. It was indeed a fulfillment of the old wish:

"O wad some Pow'r the giftle gie us
To see oursels as others see us!"

No monthly meetings during June, July and August.

September 20, 1912. Nominations for the Board of Directors.

October 18, 1912. Slides of the Mount Rainer outing of 1912. Mr. W. H. Gorham gave a pictorial narration of the trip to Mount Rainer. The club made its approach from the east; crossed the Cascade divide; encircled the mountain on the north; visited almost unknown regions whose scenic beauties are unsurpassed; then dropped down on the northwest side of the mountain, and left the wonderful national park by way of Fairfax. The pictures were of unusual interest, portraying not only the grandeur of the great mountain, the exquisite Alpine flora, but also many incidents of work, play, camp-fire and trail.

November 15, 1912. Miss Lullie Nettleton entertained the Mountaineers with a graphic description of her trip with the Sierra Club, California. Among the many interesting things she told were:

- I. The aim of the Sierra Club.
 1. Protection of natural parks, etc.
 2. Building lodges on the mountains.
 3. Club rooms, etc.
- II. The summer outing 1912.
 1. Equipment.
 2. Camps—their management.
 3. Knapsack trips.
 4. Mountains ascended: Mt. Whitney, Sawtooth Mt., the South Kaweah and Mt. Langley.
- III. Return trip.

Ascent of Mt. Shasta.

GERTRUDE STREATOR

THE EVERETT MOUNTAINEERS

The organization of The Everett Mountaineers by a few enthusiasts, not quite three years ago, was a good deal of an experiment. At that time there was no provision in the by-laws of The Mountaineers for local auxiliaries, and our organization was merely a tentative one.

The membership in Everett under these rather unsatisfactory conditions, grew steadily, local walks were held regularly, and several entertainments given, until June, 1911, when the new constitution and by-laws were passed, in which provision was made for the organization of local auxiliaries. Since that time we have made good progress and now have sixty members in good standing. During the past three months there has been more interest shown in the work of the club than ever before.

In the past years we have given four stereopticon lectures with mountain views, the last three of them being in the auditorium of the High School, with free admission to the public, three or four hundred people attending each of them. We consider this good educational work. We have also held two social evenings with programs in the houses of members.

The local walks held during the year have numbered twenty-two, five of these being joint walks with the Seattle club. The average attendance on these walks has been twenty, with a maximum of forty-nine and a minimum of five. No walk has ever been given up since the organization of the club.

A very successful, as well as an extremely strenuous, short outing, in which the ascent of West Index was successfully made, was conducted May 31st to June 2nd. In this we were joined by several members of the Seattle club. A full account of the trip by Mr. Charles S. Gleason was printed in the June Bulletin.

The Everett Mountaineers have been pleased to see their example followed by the formation of a strong local auxiliary in Tacoma, and look forward to still further extension of the work in the State.

H. B. HINMAN, Chairman.

SECRETARY'S REPORT

The Mountaineers have found the past year a very busy one. Much more work has been done than heretofore in looking up the possibilities and advantages of different districts for summer outings. This has been done not only by personal investigation, but by a great deal of correspondence. Besides this work and in addition to the many less important activities of the club, was the extensive work in connection with the proposed national park in the Olympics. This required a great deal of correspondence. We enlisted the support of individuals and organizations all over the country and though Congress did not take any action, our work was not wasted for the question will certainly come up sooner or later. Replies received to our letters, show a wide and favorable interest in the bill introduced by Congressman Humphrey. The club is chiefly concerned in preventing any hasty action. While we believe mining rights should be granted, they should be absolutely legitimate and not merely a cloak for the acquisition of timber and water-power sites. The matter of boundaries should also receive very careful consideration. We believe that by a careful survey of the district the lines may be so extended in certain parts and drawn in in others, as to allow for all legitimate agricultural development and at the same time provide winter feeding grounds for the elk. The disgraceful conditions prevailing in the Yellowstone, as regards these animals, must not be repeated here.

In regard to future outings, much reconnaissance work has been done, chiefly in the Olympics. One party, leaving Sol Duc Hot Springs, carrying all supplies on their backs, spent sixteen days in exploring the north and west sides of Mt. Olympus, a practically unexplored region. They found splendid glaciers, snow-fields, and sublime scenery, but concluded that the cost of building trails and of getting a large party into the country would be prohibitive as regards an outing there in the immediate future. Another party explored the Lake Quenilt region

and the head-waters of the Queets, and still another the Mt. Stewart country, in the Cascades. All have their individual merits and difficulties.

A new feature this year was the appointment by the Board of a committee to make a collection of photographs which would illustrate, consecutively, the different outings of the club—the scenery and some important or interesting features. Also the collection of lantern slides, covering the same outings, was enlarged and, in so far as possible, all gaps filled.

In response to an invitation from Secretary of the Interior Fisher, the club appointed Mr. Wm. H. Gorham and Mr. E. T. Parsons to represent it at the conference of National Park Superintendents in the Yosemite National Park in September. Mr. Gorham reported that the conference was a great success through the useful and helpful exchange of ideas and experiences. The report was published in full in the Bulletin.

The club had the pleasure of entertaining Miss Dora Keen on her way to Alaska and Mt. Blackburn and also on her return from her strenuous expedition, when a banquet was tendered Miss Keen, Prof. Parker, Mr. Belmore Brown, and Mr. Merle LaVoy, the latter members of Prof. Parker's party in his assault on Mt. McKinley. Our guests entertained us with a most interesting and vivid account of their experiences, much to the pleasure of those present.

The Mountaineers continue to grow with the lusty vigor of youth and a good constitution, though the Board of Directors are considering some changes to be offered the club in regard to the latter. The membership, including applications to November 1, has increased during the year from 376 to 457, certainly a creditable showing. The Everett auxiliary, under its enthusiastic leader, has increased its membership to fifty-seven. During the year they have enjoyed many outings and entertainments. The Tacoma auxiliary, under the able management of Mr. A. H. Denman, has also experienced a most satisfactory season.

For the future, the prospects of the club are very bright and its activities will doubtless continue to expand. In fact, an institution that can so successfully call on its members for the very large amount of hard, unselfish work necessary to manage the local walks, outings, publications, and other undertakings, is bound to succeed.

CHARLES M. FARRER, Secretary.

TREASURER'S REPORT 1911-1912

Receipts

Balance in Seattle National Bank, Oct. 30, 1911.....	\$ 245.83	
Financial Secretary	1,334.99	
Local walks	265.18	
Advertising in Bulletin and Prospectus.....	144.50	
Advertising in Annual	154.24	
Interest	86.07	
Loans	160.00	
Sale of Annuals	11.50	
		\$2,402.31

Expenditures

Prospectus and Bulletin	\$ 214.17	
Mailing and Addressing	61.75	
Expended by Historian	17.82	
Expended by Treasurer	19.40	
Annual	567.75	
Slides	134.05	
Financial Secretary (salary)	137.50	
Printing and Stationery	65.50	
Refund to branches	49.00	
Bonds	211.00	
Loans	160.00	
Miscellaneous	37.40	
Outing Committee	255.00	
Outstanding check Oct. 14, 1911.....	5.50	
		<u>\$1,935.84</u>

Receipts**Outing Fund**

Cash in Bank of California Oct. 14, 1911.....	\$ 207.91	
Loan returned from General fund.....	120.00	
Members on Outing 1912.....	2,328.26	
General fund	255.00	
		<u>\$2,911.17</u>

Expenditures

Reconnaissance, 1911 and 1912, in Olympics.....	\$ 179.30	
Loan to General fund.....	120.00	
Album for packer	2.30	
Phones and telegrams	7.50	
Outing 1912	2,554.35	
Re-union	15.45	
Outstanding checks Oct. 14, 1911.....	17.10	
		<u>\$2,896.00</u>

Permanent Fund

Cash in Bank for Savings Oct. 14, 1911.....	\$ 33.00	
Cash in Bank for Savings Oct. 9, 1912.....	193.07	

Total Cash Received

General fund	\$2,402.31	
Outing fund	2,911.17	
Permanent fund, in bank 1911.....	33.00	
		<u>\$5,346.48</u>

Total Cash Expended

General fund	\$1,935.84	
Outing fund	2,896.00	
		<u>4,831.84</u>

Balance

Cash in Metropolitan Bank	\$ 306.40	\$ 514.64
Cash in Bank of California	15.17	
Cash in Bank for Savings	193.07	
Total cash on hand		<u>\$ 514.64</u>

Respectfully submitted,

P. M. MCGREGOR, Treasurer.

Additional Assets

Permanent fund owns 7% bonds	\$ 200.00
General fund owns 7% bonds	1,000.00

Audited Oct. 30, 1912.

H. A. FULLER
IRVING M CLARK

Original

Seattle, Wn., Oct. 30, 1912.

The Mountaineers, Seattle, Wn.

Your Auditing Committee has compared the financial accounts of the Treasurer for 1911-1912 with the vouchers and find the comparison correct. They show:

General fund, receipts of	\$2,402.31
And Expenditures of	\$1,935.84
And Transferred to Permanent fund.....	160.07
	<u>\$2,095.91</u>
Balance	306.40
	<u>\$2,402.31</u>

The balance on hand of \$306.40 is on deposit with the Metropolitan Bank.

Outing fund, receipts of	\$2,911.17
And Expenditures of.....	2,896.00
	<u>\$ 15.17</u>

The balance on hand of \$15.17 is on deposit with the Bank of California.

Permanent fund, receipts of	\$ 193.07
And Expenditures	None
	<u>\$ 193.07</u>

The balance on hand of \$193.07 is on deposit with the Bank for Savings.

Assets:

- Permanent fund 7% bonds, \$200.00 par value.
- General fund 7% bonds, \$1,000.00 par value.
- These bonds are in the hands of the Treasurer.

H. A. FULLER,
IRVING M. CLARK,
Auditing Committee.

REPORT OF THE CHAIRMAN OF THE OUTING COMMITTEE

The objective point of the Summer Outing of 1912 was Summerland and Glacier Basin (El. 7,000 ft.) on the eastern and northeastern slopes of Mount Rainier. The distinguishing feature of the Outing and its most satisfactory result was the finding a way for a large party with pack train into Rainier National Park from the east. The approach

was from the upper Yakima Valley near Cle Elum up the eastern slope of the main range of the Cascades, via Manastash Ridge and Naches River, then down its western slope and into Rainier National Park on its eastern boundary. This took the party through a wild mountainous country with elevations from 3500 to 5500 feet and entirely within the Rainier National Forest. From the summit of the main range westerly to the eastern boundary of the Park, so far as available trails for pack trains were concerned, is practically an unknown country; and as to this particular part of the country neither the Supervisor of the Forest nor the Superintendent of the Park were able to give us any information on which they would wish us to rely. From the junction of the White and Frying Pan rivers in the Park, it was necessary to cut a trail up the latter river to enable the pack train to get into Summerland,—three days were spent in this work with ax, cross-cut saw and grub hoe. One-half of the mountain on the east and north from Cowlitz Park and Urania Glacier on the southeastern slope to Spray Park on the northwestern slope, was covered by the party, at elevations ranging from 5000 to 7000 feet. Summerland, Cowlitz Park, Glacier Basin, Lodi Basin, Grank Park, Spokwush Meadows or Basin, and Spray Park were visited and the Frying Pan, White, Inter-Glacier, Winthrop and Carbon glaciers were traversed.

Seven of the party with two others who met us at Glacier Basin made the summit of Mount Rainier on August 3rd.

The total mileage of the outing, en route, was one hundred and thirty-nine; the time occupied twenty-two days.

Barring the loss of two assistant cooks by desertion and one pack horse over the cliff, there were no casualties.

The return home was through the northwestern portion of the Park, via Carbon River, to Fairfax, thence by rail to Seattle.

WILLIAM H. GORHAM,
Chairman of Outing Committee.

The Local Walks Committee submits the following report for the year ending September 29, 1912:

There were 21 Sunday walks with an average of 97 people, 10 Saturday walks with an average of 39 people, and three special outings with an average of 127 people.

The largest number on any one walk during the year was 220. There was a boat chartered for twelve of the Sunday walks. On these trips there was an average of 124 people. The large attendance enabled the committee to charter boats for points which could not be reached otherwise on account of schedules and also reduced the expense per member.

Up to date a balance of \$274.18 remains in the local walk fund.

G. R. HURD, Chairman.

"WHEN THE FORESTS ARE ABLAZE"

Katharine B. Judson

"A western tale having for its object the terrific fires which two or three years ago devastated a hundred thousand square miles of timberland.

"The tale is simply written, but it holds the interest and nothing more vivid than the description of the forest fire and the devastation of the little towns and the fortitude of the people can be imagined. That part certainly is written by one who knows and is a true lover of forests."—Chicago Tribune.

Miss Judson is a member of The Mountaineers and has dedicated her book to the club.

LIST OF MOUNTAINEERS ON SUMMER OUTING OF 1912

Abel, H. V.	Hultin, Chas. A.
Annesley, Inez H.	June, A. H.
Avey, O. L.	Jones, N. E.
Bailey, Winona	Ingraham, E. S.
Barlow, Jessie C.	Irish, Evelyn
Belt, H. C.	Kidd, Jessie A.
Belt, Mrs. H. C.	Kratsch, Ida
Benedict, Anna L.	Kendall, Elizabeth
Brackett, A. H.	Lovering, Lydia
Brown, Elizabeth J.	McGregor, P. M.
Bryant, S. V.	Mason, Allen C.
Burroughs, Edna	McKay, Helen
Cameron, Christine	Meany, E. S.
Clark, I. M.	Otis, B. J.
Coleman, Linda M.	Paschall, Mary R.
Corey, C. R.	Pearce, Duncan
Davidson, Lola M.	Rand, Grace
Denman, A. H.	Reynolds, Carrie
Daniels, Joseph	Scholes, Josephine
Flett, J. B.	Scholes, Emma
Furry, Mabel	Schumacher, K.
Gleason, Chas. S.	Smith, T. H.
Gorham, Kathleen	Spencer, H.
Gorham, William H.	Stauber, A. H.
Gorton, F. Q.	Teel, Ellen
Hack, E. H.	Talbot, C. B.
Hazard, J. T.	Wood, N. P.
Hazard, Mrs. J. T.	Van Wagerman, Ethel
Hinman, H. B.	

INTO THE OLYMPICS
—
OUR SEVENTH ANNUAL OUTING
—

CHAS. ALBERTSON
—

No official action in regard to a trip into the Olympic Mountains in 1913 has been taken by the Board of Directors, yet the consensus of opinion of the individual directors is definitely in favor of it.

Through the courtesy of the Forest Service officials, Mr. L. A. Nelson will be released from his duties in order to act as Chairman of the Outing Committee. He will lead the outing.

The summer trip as tentatively planned, extends from the Straits of San Juan de Fuca on the north clear over the rugged Olympic Peninsula to the Pacific Ocean on the south.

Up the Puget Sound and halfway out the Straits by steamer we go to Port Angeles. Then eleven miles of motor road to the Elwha River where we are again at home on the timbered trail among the mountains. For several days we follow this winding and climbing trail up the Elwha Valley to the head waters and even on over the divide (Dodwell-Rixon Pass) into the sources of the Queets River on the Pacific watershed. This is the trail of "The Mountaineers" on their first annual outing in 1907.

Main camp will probably be in the Queets Basin at about 5000 feet elevation, in full sight of Mt. Olympus, in a wonderfully beautiful natural park with scattered trees, lakes, brooklets and flowers. It is flanked on either hand by precipitous rock cliffs and glacier covered mountains and affords a long vista down the forested Queets. At least ten days will be allotted for real life in this beauty spot.

Mt. Olympus, 8250 feet, can be climbed in one day from main camp. The canyoned head waters of nearly all the important rivers of the Olympic peninsula, flowing in all directions from the mountain, are readily reached. From nearby peaks extensive yet companionable views are obtained without excessive work, while sheer canyons and ice-bound summits will test the ability of the most expert mountaineer.

On the way out we will likely camp near the sisterly lakes, Margaret and Mary, nestling in the low divide. Thereafter the little-known route follows an ancient and well-worn elk trail down the North Fork of the Quenlult River, then westerly up a branch stream to the top of the rolling Queets-Quenlult divide. Here for a few days above the heavy timber line in a superb park country at an average elevation of 6000 feet we camp and tramp coastward until we drop down through the timber again to the Indians' gem—Lake Quenlult.

A canoe trip across the lake and down the Quenult River over thirty miles to its mouth at Tahola on the Pacific Ocean follows. The Indians are expert canoe men and the day's trip will be a delight. On the way down are small houselike Indian graves and myriads of wild fowl, while the uninhabited wooded banks give one the feeling of being in the uttermost parts of the earth.

From the Indian fishing village of Tahola we walk nine miles down the broad ocean beach to Moclips, then the train home.

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Summer*

The latest of our national playgrounds. It lies in the western section of Montana, between the Great Northern Railway and the Canadian boundary line, and its 1525 square miles contain over 250 deep blue lakes of glacial origin as well as innumerable mountain streams that find their source in the 60 living glaciers and snow-capped peaks, within the borders of the park.

Here the Rocky Mountains tumble and froth like a wind-whipped tide as they careen off to the northwest of Canada and Alaska. Here is the backbone of the continent and the little and big beginning of things; here, huddled close together, are tiny streams, the span of a hand in width, that, leagues away to the north, the south and the west, flow mighty rivers into Hudson's Bay, the Gulf of Mexico and the Pacific Ocean; here peak after peak, named and unnamed, rear their saw-tooth edges to the clouds; three-score glaciers within its borders are slowly and silently grinding away at their epochal task; three hundred lakes in valley and in mountain pocket give back to the sky its blue, gray or green; half a thousand waterfalls cascade from everlasting snow in misty torrents or milk-white tracteries; rainbows flicker and vanish in the everchanging play waters, while the clear Montana sun does tricks of light and shade on pine and rock. High up on some gale-swept crag the shy goat pauses for a moment and plunges from view; lower down the big horn sheep treads his sure-footed way. And all is as it was when the world's first day was done, save for some man tracks here and there on the winding slopes.

Glacier National Park has no side-shows for garrulous trippers; it has no Coney Island attractions; it has no geysers; there are other canyons as deep; other mountains as high; but those who have roamed the world with open eyes say earnestly that there is no spot where nature has so condensed her wonders and run riot with such utter abandon; where she has carved and hewn with such unrestrained fancy and scattered her jewels with so reckless a hand.

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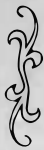
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