

U. of W. geologist seeks answers to this question:

# When Did Our Volcanoes Last Erupt?

By LUCILE McDONALD

**H**OW young are Washington's volcanoes?

Prof. Howard A. Coombs, head of the Geology Department at the University of Washington, is trying to place exactly the dates of the last eruptions in the Pacific Northwest for the International Association of Vulcanology, which soon is to publish a catalog of active volcanoes of the world.

"We don't say that Washington's highest peaks are dead volcanoes," Dr. Coombs said. "We call them dormant."

The pressure of a concentration of steam and molten masses within the earth is unpredictable; it will break through in the weakest place. Eruptions have occurred through the ages in every period, on every continent, on islands and on ocean floors.

Some volcanoes have gone on erupting for centuries. Stromboli, on an island off Southern Italy, has displayed its fires for 2,000 years or more.

Washington's snowy summits have spewed no ashes since the 1880's, Dr. Coombs believes. It is a point he wants to establish as certain.

Mount Rainier or Glacier Peak may have been the last ones to show minor activity. Dr. Coombs some years ago talked with Len Longmire, descendant of the Washington pioneer for whom Longmire Springs on Mount Rainier was named. Longmire recalled seeing brown, billowy clouds issuing from Rainier's crater in 1879, and again in 1882.

F. E. Mathes, who prepared a geological survey of Mount Rainier, said records existed of feeble eruptions in 1843, 1854, 1858 and 1870. Indian legends indicated a cataclysmic eruption at an earlier date, which could not be verified.

**D**R. COOMBS would like to learn of any mentions in old journals and diaries telling of persons who saw steam arising from the mountains of Washington. He also is interested in any dated sketches of such occurrences.

The latest date he has on Mount Baker is an eruption in December, 1859. Flashes of light, black smoke and steam were observed. The last mention of activity on Mount St. Helens was in 1847.

Concerning Mount Adams, Dr. Coombs thus far has been able to learn nothing of volcanic manifestations, although he believes the peak undoubtedly belongs on his list.

"All of the summits above 11,000 feet in height in the Cascades are volcanoes," he said. "Their formation, we estimate, began about 1,000,000 years ago. We know this because they supported the glaciers of the Ice Age. They were built up with repeated eruptions.

"The lesser peaks of the range around them were formed by an earlier uplift of rocks. For instance, Mount Baker was a volcano but its neighbor, Shuksan, was not.

"The Cascades were bowed up in a broad, gentle arch. One can trace this action in the Columbia Gorge where arched layers are exposed. After the uplifting of the mountains, the volcanoes popped out and burst through. They are made up of layers, those of pumice or ash indicating periods of violence and those of ba-



**PROF. HOWARD A. COOMBS**, executive officer of the University of Washington Geology Department, showed two volcanic specimens. At the left was a piece of pumice, natural volcanic glass blown to a froth so light it floats on water. At the right was a volcanic bomb, which was erupted as fluid lava and streamlined in flight before solidifying.—Times photo, Roy Scully.

salt resulting from quiet lava flows. These layers alternate in all Washington volcanoes."

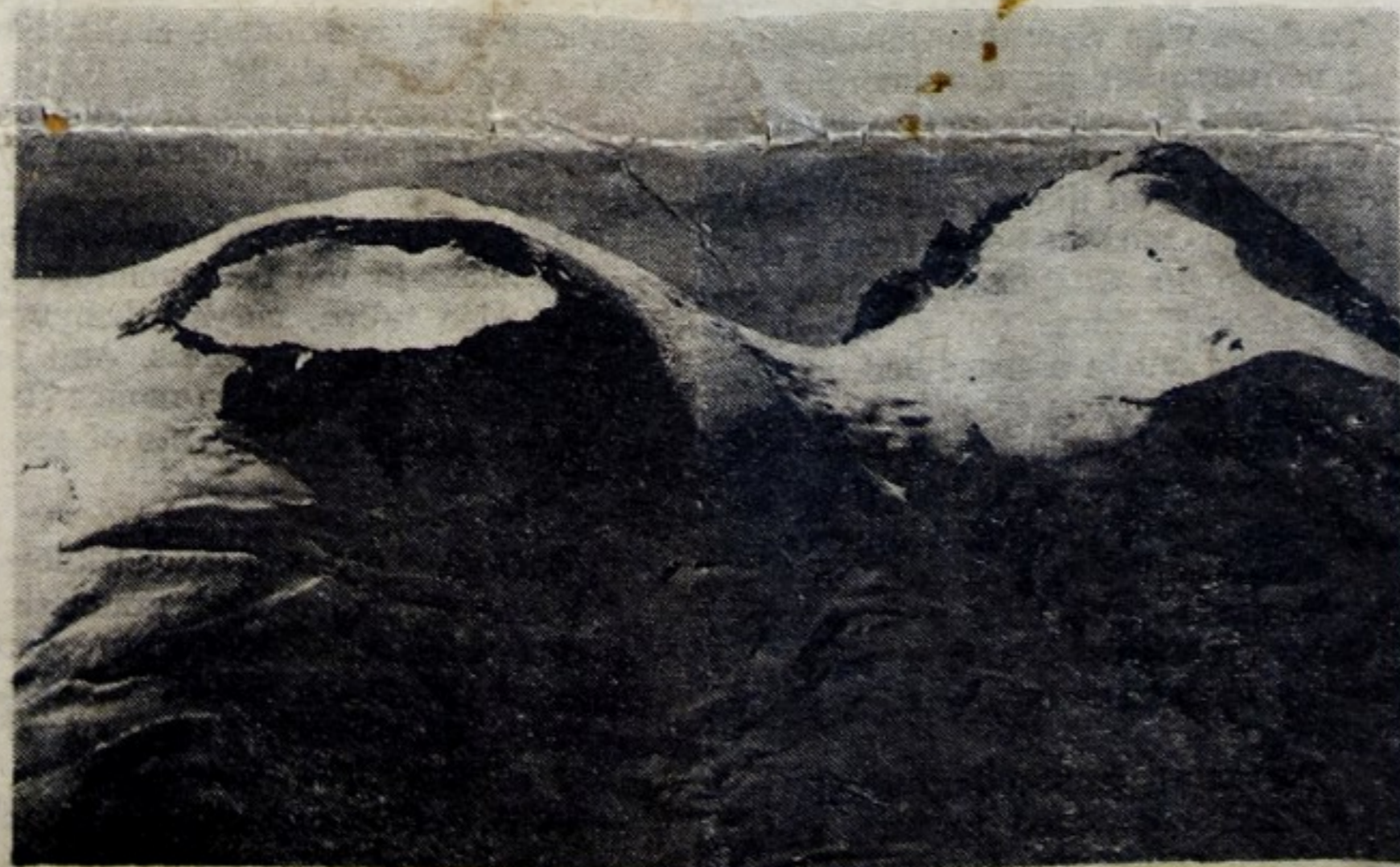
Dr. Coombs said that the regular shape of Mount St. Helens probably is an indication that it is younger than the others. It has not been eroded or gouged out deeply by glaciers as in the case of Rainier.

Mount Baker has indications of an earlier crater than the present one. "Two miles west of the summit,"

Dr. Coombs explained, "is a pair of rocks called Black Buttes, once part of the rim of the old volcano. The vent plugged and froze, and the mouth changed after the plugging. Steam and sulphur issue from the present crater."

Dr. Coombs added that the buttes appear black because they are so steep they do not retain snow.

There is no sulphur on Mount Rainier, but the element is found on



**MOUNT RAINIER'S CRATER**, at the left, emitted brown billowy clouds in 1879 and 1882, Professor Coombs was told. Steam still issues from Rainier and natural warmth keeps the crater rim free of snow much of the year.—Photo by Pacific Aerial Surveys, Inc.

Adams and Baker and on Hood in Oregon. Sulphur, a crystallized form of a gas issuing from the depths of the earth, formerly was mined on Mount Adams.

Rainier has no sulphur, but it still emits wisps of steam, which issue from rocks on the summit almost at the box where those who scale the peak sign a roster.

The crater of Rainier is filled with ice, but steam causes it to melt and one may go down and explore the cavities.

Asked if Little Tahoma peak owed its formation to plugging, as in the case of Black Buttes, Dr. Coombs replied that it is a remnant of the side of the main peak where glaciers cut through. He has a photograph taken there showing the stratification of alternate layers of pumice and andesite (basalt).

**P**UMICE is liquid rock blown into froth by steam. Dr. Coombs describes it as "pure glass threads." It is one of the most useful products of volcanic action. It goes into building blocks, has cleansing properties and is a mild abrasive used by dentists. Ground into "rotten stone," it is employed in furniture finishing.

Cinders, "basalt with blow holes," at times have proved useful for surfacing country roads in Eastern Washington and Oregon.

Obsidian, another by-product of volcanoes, was valued by Pacific Northwest Indians for making arrowheads and spearheads. It is natural glass, molten lava which has flowed out without violence.

All of Eastern Washington once was a great lava flow. The molten rock issued from the earth through cracks many miles long. Dr. Coombs says one can find vertical basalt-filled cracks amid the sandstone cliffs on the old Blewett Pass Road in Chelan County. These dikes were feeders for lava flows.

Glacier Peak spread more ash and pumice than any other peak in Washington. It extends long distances on both sides of the state and a layer of it has been found in the bottom of Lake Washington.

**A** FEW scattered tiny cinder cones exist in Oregon and Washington.

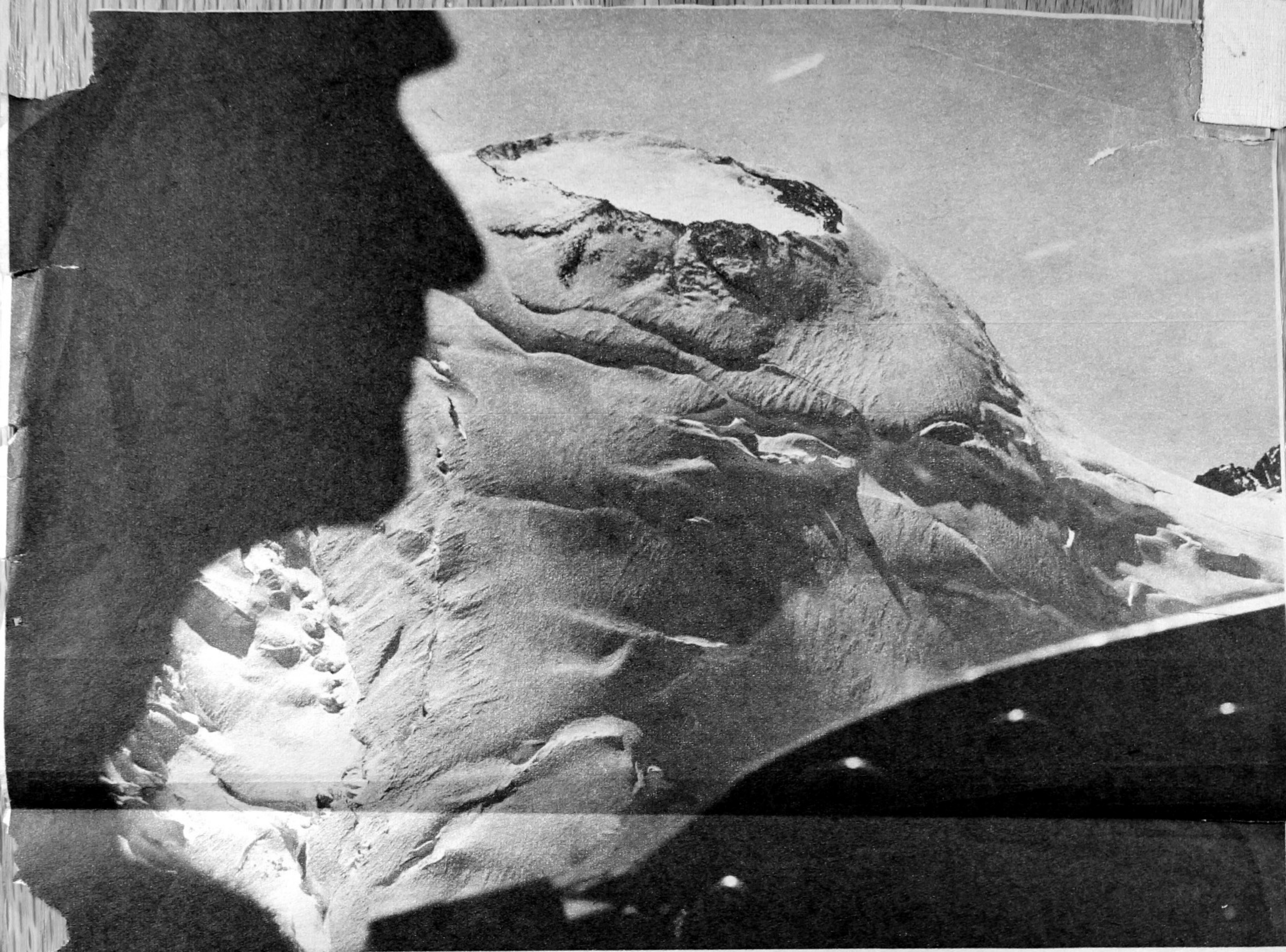
"Undoubtedly they came very late and were the volcanoes' last gasp," Dr. Coombs said. "They are in relatively inaccessible places and we have little information on them. I'd be glad to hear from anyone having knowledge of their last eruption.

"I also should like to hear from anyone who has found traces of wood in volcanic ashes in this state. Only by the presence of wood are we able to date eruptions. This is done by radio-carbon tests."

The survey Dr. Coombs compiles will go to Dr. Neuman Van Padang of The Hague, who has charge of publication of the vulcanology association's periodicals. Dr. Coombs was asked to report on all active volcanoes in the United States.

The definition of "active" in this instance means "in historic times." As Dr. Coombs says, he is at a disadvantage because the history of the volcanic regions of the United States is short, compared with the documentation of such peaks as Vesuvius.

Were the Italians can consult sources 2,000 years old, Dr. Coombs can go back no more than 160 years in written records.



The face of James Beech and the instrument panel of his airplane were silhouetted against the frosted summit of Mount Rainier. As Beech flew

around the crater rim, he was as elated as any mountain climber after reaching the top. Flying skill and knowledge of air currents are essential.

## Mountain-Climbing by Plane

ONE of the disadvantages of being a groundling in mountain country is that the rugged beauty of a great peak, such as Mount Rainier, either is too far away to be seen in detail, or, it is too close to be seen in the proper perspective. The birds have it much better than we.

James Beech, a former music teacher who lives at Ashford, near the southwest entrance to Mount Rainier National Park, gave this problem considerable thought and came up with a solution. He decided to "climb" the mountain in a light airplane.

The idea wasn't new. Mount Rainier has attracted flyers almost since the airplane was invented. Beech, however, has made a specialty of flying high and close to the mountain.

Beech has lived at Ashford more than 25 years. His great interest in Mount Rainier began in 1930

when he climbed the mountain and spent a night on the steam-heated crater rim at the summit.

Beech began flying in 1952 and received his commercial pilot's license about a year and a half ago. Last summer he began a flying service at Hewitt Field, a tiny forest-surrounded air strip near Ashford.

It is from here that Beech and his passengers make their aerial climbs of the mountain. As the plane circles the mountain, reaching for the 14,410-foot height of Columbia Crest—the crater at the peak—those aboard the light craft are treated to new and exciting views of glaciers, ridges and alpine meadows.

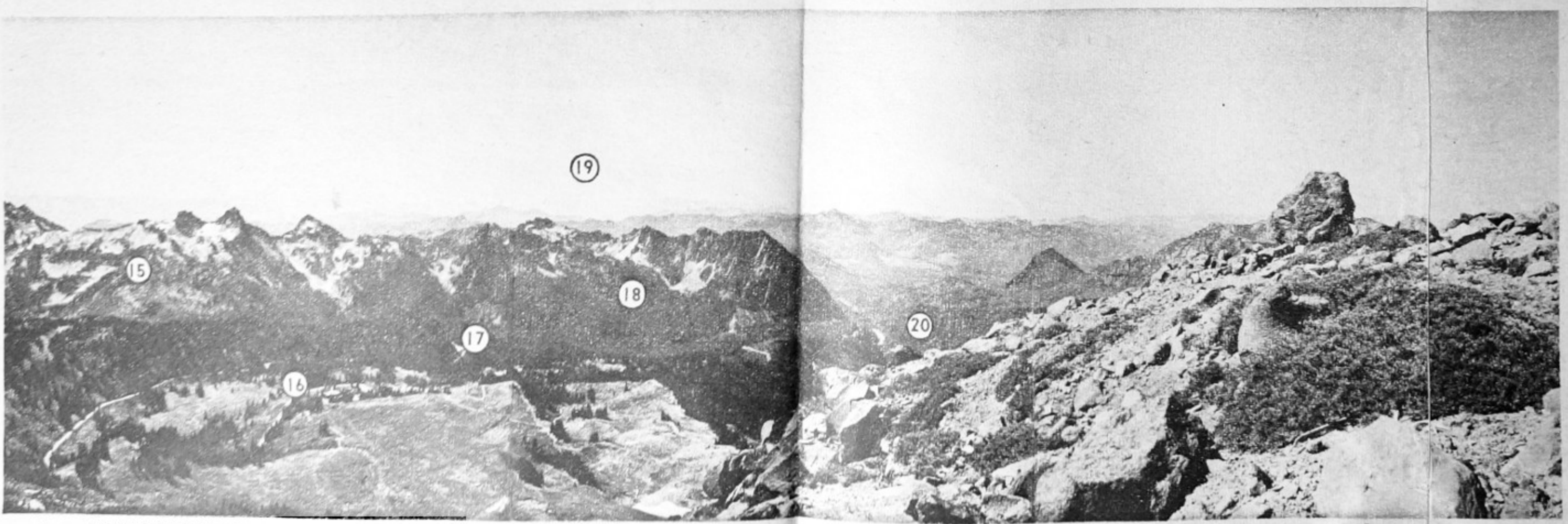
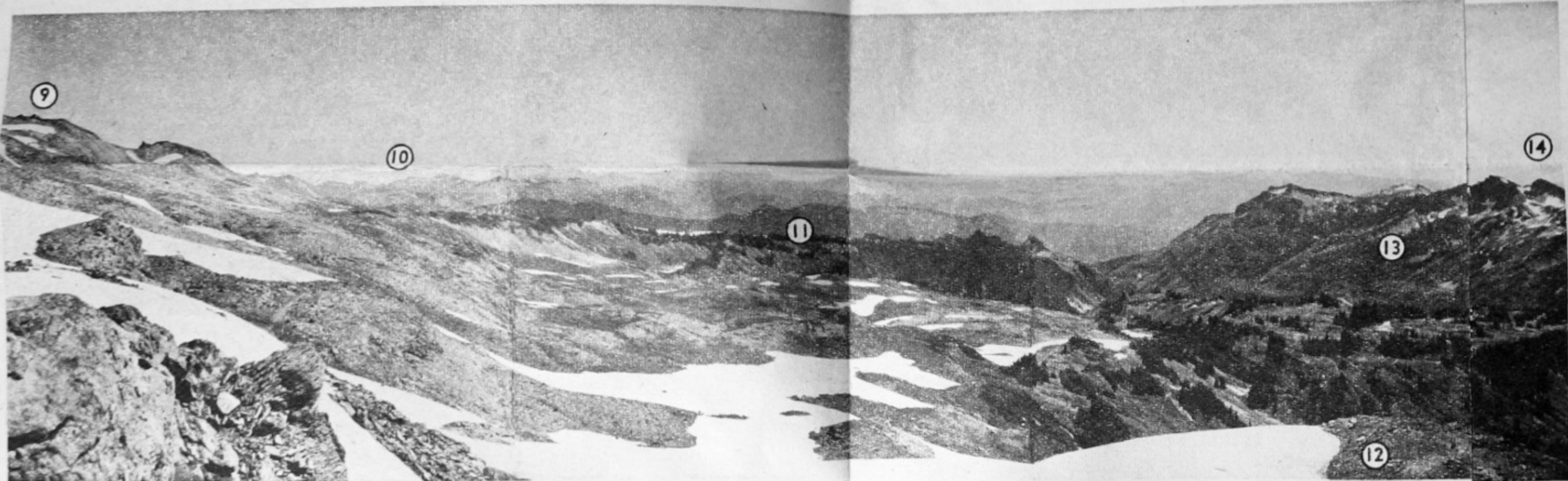
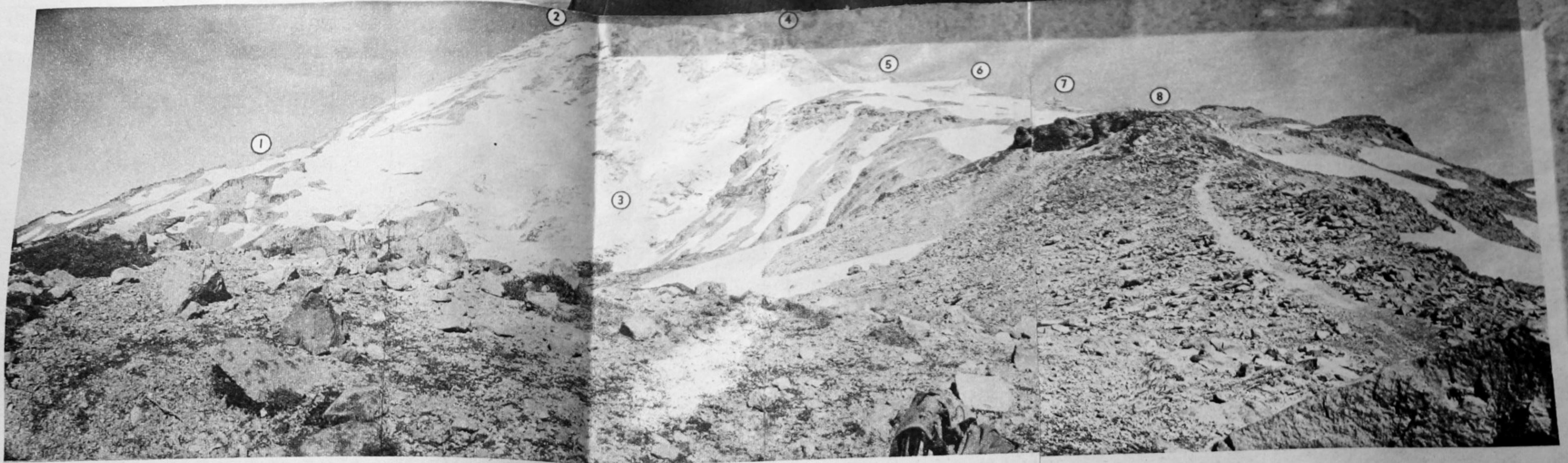
It's a spectacularly different way of looking at this massive pile of rock and ice, and, as Beech says, "You haven't discovered Mount Rainier until you have seen it from the air."



James Beech

Photos by Bob and Ira Spring

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## Rainier and Neighbors Full Circle View

LIKE a good many photographers in this area, A. N. Nickols, Seattle, never tires of "shooting" Mount Rainier.

Until a year or two ago, Nickols' only complaint about the mountain was that it was too big and the vistas from its flanks were too sweeping to be captured on one piece of film. The photographer solved his own problem by perfecting a technique of taking panoramic photos. With this method, involving the making of multiple exposures, he can record full 360-degree views from any given point. Now Nickols has no complaint at all about the mountain.

Two of Nickols' panoramic views of Mount Rainier were published in this section just a year ago. The response from readers was satisfying, and there were many requests for more panoramas. On this page is Nickols' latest effort.

The three strips are divisions of a single strip of ten separate photographs which were taken from a rocky shelf about 1,200 feet above Paradise Valley's 6,800-foot Panorama Point. The edges of the three strips can be fitted together to form the full view in all directions.

The numerals superimposed on the photos point up many of the prominent peaks, ridges, mountain ranges and valleys that can be seen from this viewpoint.

Beginning with the top strip, which looks north toward Mount Rainier itself are: 1. Success Cleaver. 2. Columbia Crest, the mountain's highest point. 3. Nisqually Glacier. 4. Gibraltar Rock. 5. Cathedral Rocks. 6. Anvil Rock. 7. Little Tahoma Peak. 8. McClure Rock.

The second strip, looking from northeast to southwest, includes: 9. Cowlitz Rocks. 10. The Cascade Range and Snoqualmie National Forest. 11. Stevens Ridge. 12. Panorama Point. 13. The Tatoosh Range. 14. Mount Adams.

The bottom strip sweeps from south to northwest and shows: 15 and 18. The greater part of the Tatoosh Range. 16. Paradise Valley. 17. Richbeck Point. 19. Mount St. Helens. 20. Nisqually River.



# The Day The Mountain Was Conquered

By William J. Betts

**F**ROM THE VERY BEGINNING the Great White Mountain was looked upon with awe. First the Indian, who saw it as a dwelling place of the Great Spirit; then the white man, who looked and fell under the spell of the unconquered, ruggedly beautiful extinct volcano and wished to climb to the summit where he "would be one with the gods."

Capt. George Vancouver named it Mt. Rainier after an admiral friend in the British Navy, much to the chagrin of a future city that would rise on Puget Sound in the shadow of the great mountain. The Indians called it Tacoma or Tahoma, meaning The Mountain.

Dr. William F. Tolmie, the gentle physician stationed at the Hudson's Bay Company's Fort Nisqually, approached the mountain in 1833; the first white man to stand on its slopes, although he made no attempt to climb to its summit.

Later, a young officer stationed at Ft. Steilacoom looked from the window of his quarters and saw the mountain shining in the sun, looming high above the darker line that was the Cascades. Lt. August V. Kautz became struck by "mountain fever." He had to climb Mt. Rainier.

In August of 1857, Lt. Kautz, with several companions and Indians as guides, fought their way to Mt. Rainier. After great hardships the army officer was standing near the mountain top. "Finally," he wrote later, "we reached what may be called the top, for although there were points higher yet, the mountain spread out comparatively flat, and it was much easier to get along." The real summit of Mt. Rainier remained unconquered.

**IN THE LATE 1860s** two men came to Washington Territory who were destined to make the ascent of Mt. Rainier. They were Gen. Hazzard Stevens and Philomen Beecher Van Trump.

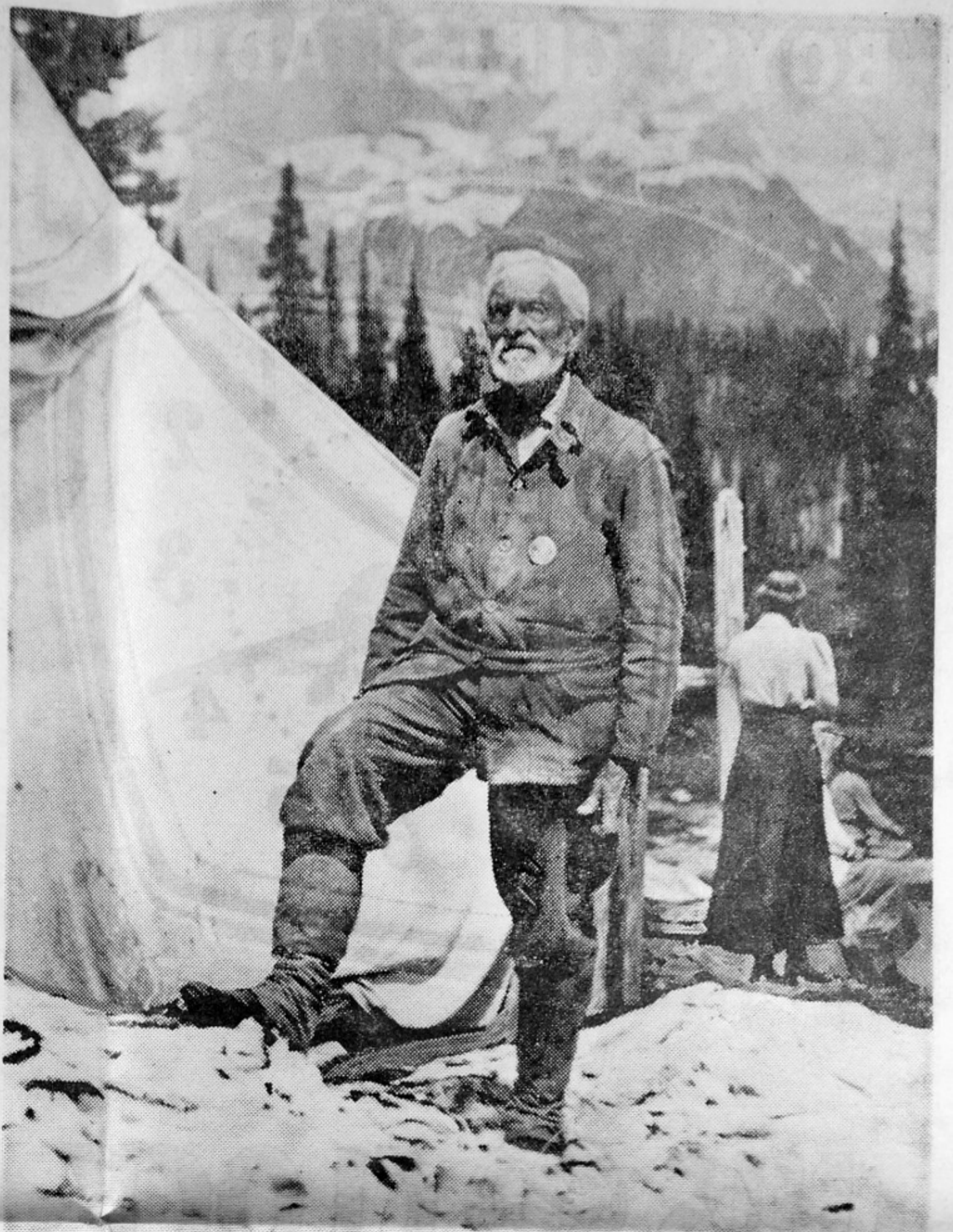
General Stevens, son of the first governor of the territory, Isaac A. Stevens, had accompanied his father on his Indian treaty making expeditions throughout the Northwest in the 1850s. Hazard was one of the youngest generals in the Civil War, and was wounded in the same battle in which his father lost his life, at Chantilly. Hazard was a captain at that time.

General Stevens returned to Washington Territory as a customs collector and in the course of his duties did much riding over the prairie country around Olympia. Like Lt. Kautz before him, Stevens was bitten by the climbing bug as he gazed at Mt. Rainier rising above the flatlands of the Olympia area.

Van Trump came to Washington Territory for the second time in the summer of 1867 as the secretary of his brother-in-law, Marshall F. Moore, the seventh governor of Washington Territory. He also dreamed of climbing the lofty cone.

It seemed only natural that the paths of these two dreamers would converge and their mutual interest in the mountain cement a warm and lasting friendship. Whenever they got together the talk always got around to the subject of climbing Mt. Rainier. Only their lack of mountaineering experience made them reluctant to attempt it.

**IN EARLY 1870** the two men met an Englishman, Edmond Thomas Coleman, a member of the British Alpine Club who had climbed several peaks in the Swiss Alps. He had been the first white man to reach the summit of Mt. Baker in August



of 1868, and was anxious to conquer Mt. Rainier.

The three men spent long hours planning an assault on Mt. Rainier, and on Monday, August 8, 1870, left Olympia for the James Longmire ranch at Yelm. Previous arrangements had been made with the pioneer rancher as a guide over the trail that Longmire and Packwood had blazed some years before. Longmire would guide them as far as Bear Prairie, where he promised to help them engage an Indian guide.

Much of the old Packwood Trail was obliterated and they had a rough time pushing their way toward the mountain. Their outfit was packed on a horse and mule while Longmire rode a saddle mule. The three moun-

tainers walked to condition themselves for the climb. They followed the Nisqually River valley where vine maple grew like a jungle, so thick as to be nearly impenetrable. When they left the river and entered the forest, the mules had a rough time negotiating through and around downed timber, swamps and old burns where the trees lay jumbled like giant jack-straws.

Near the present town of Eatonville, they lost the old Packwood Trail and the going became even more rugged. Flies and mosquitoes plagued both man and mule and stings from yellow jackets repeatedly stampeded the animals, causing long delays in retrieving and repacking scattered equipment.

Coleman held the party up as well, frequently becoming separated from the rest of the party and causing the others to backtrack to look for him. When Stevens and Van Trump protested that he was holding them up, Coleman would reply, "We didn't travel so in the Alps."

**BY AUGUST 13** the party had arrived at Bear Prairie

and established a base camp. Longmire and Stevens left for the upper Cowlitz where they hoped to find a guide among Chief Poniak's band of Cowlitz Indians.

Poniak's band was not in their usual camping place, but the two men found a Klikitat, who called himself Sluiskin, encamped nearby with his wife, small son and baby. Sluiskin agreed to guide them to Mt. Rainier for a dollar a day plus rations for his family.

The following day, Sluiskin arrived at the base camp with his family, and the next day Longmire left for Yelm while Stevens, Van Trump and Sluiskin headed for Mt. Rainier via the crags of the Tatoosh Range. Sluiskin's wife was left in charge of base camp.

On the first day's trek, Coleman again became separated from his companions, and in trying to take a shortcut to catch up lost his gear over a cliff. Sluiskin was sent back to see what had happened to the Englishman, and the Indian returned sometime later and told of seeing Coleman striding back toward Bear Prairie. Sluiskin was disgusted with the "Boston man" and

—(Oregon Historical Society Photo.)



A YOUNG HIKER rests on monument erected by Seattle and Portland mountaineering groups to commemorate last camp of Van Trump and Stevens before final step of climb of Mount Rainier. Carvings on rocks tell details. Monument is on trail to Paradise Glacier and ice cave.



MANY TOURISTS now use saddle horses to travel the trails of Paradise Park in the area where Van Trump, Stevens and their Indian guide, Sluiskin, made their final camp, which was just below where this photo was taken. Note wide trail now available to riders and hikers.

Stevens and Van Trump were relieved to be free of the alpinist who was more a hindrance than a help.

The second day from Bear Prairie the party made camp near a series of beautiful little lakes (Reflection Lakes) on the divide between the Cowlitz and the Nisqually Rivers.

**ALL THE WAY** from base camp Sluiskin had ridiculed the two would-be mountain climbers, but now there seemed to be a change in his attitude. He implored them not to attempt the ascent of Mt. Rainier, saying that there was a lake of fire on the summit where a fierce demon lived. It would mean death for them to go up there. "Wake klatawa. Wake klatawa," he implored them in Chinook jargon. "Don't go. Don't go."

Stevens and Van Trump were deeply moved by their guide's imploring speech but they had no intention of

changing their minds about climbing the mountain. All that night the Indian guide sang his song of death, believing that the two white men would never return from the summit and afraid that he would be blamed for their death.

The next evening they encamped just below a large glacier which Stevens gave the name of Little Nisqually (called Paradise Glacier today). Near their camp a river cascaded down the mountain forming beautiful falls to which the two whitemen gave the name of Sluiskin Falls in honor of their Indian guide.

During the night the wind whipped their campfire into a shower of cascading sparks which ignited nearby alpine fir into a miniature forest fire. "The night was dark and windy," Stevens was to write later, "and the scene — the vast, dim outlines of Takhoma, the white snow-fields, the

roaring torrent, the crackling blaze of the burning trees—was strikingly wild and picturesque."

On the following morning, August 17, as soon as it was light enough to see, Stevens and Van Trump were on their way up the mountain confident that they would have plenty of time to reach the summit and return before nightfall. Sluiskin had left camp before them, presumably to hunt mountain goat.

**THE TWO MEN** followed the Cowlitz Cleaver after having crossed the ne've' of the Paradise Glacier, encountering little difficulty until they came to the point where the cleaver joins Gibraltar Rock. They finally found a "ledge" on which they could circumvent the great perpendicular rock mass. It was here that they encountered falling rock from above which threatened (it's still a threat to

climbers using this route today) to dash them from their ledge to the ice a thousand feet below them.

Once safely past Gibraltar they climbed up an ice "chute" formed where the glacier met the face of the rock cliff. This proved to be a dangerous area as rock continually slid down the chute from above. Once sliding rock knocked Van Trump's alpinestock from his hand, sending it cascading down the Nisqually Glacier ice.

It was much safer and easier going after they got above the chute, where the mountain wasn't quite so steep. They encountered crevasses on the glacier but none they were unable to negotiate.

Their good fortune ended at the 14,000 foot level, where they were stopped by a deep crevasse much too wide for them to jump. They walked along the barrier until they came to a place where the upper side of the crevasse overhung the lower side. Here Van Trump was able to lasso an ice pinnacle on the overhang with their rope and the two men pulled themselves hand over hand to the ice above.

They met with no more obstructions and soon were on the crest of the mountain, where a gale force wind struck them. Exhausted and bent nearly double by the frigid blast, they finally reached the highest point (Columbia Crest) on the mountain. Their dream of conquering Mt. Rainier was at long last a reality.

**THE TWO MEN** had spent too much time on the final ascent and could not make it back to camp before darkness overtook them, so they explored the crater on the summit for some refuge from the wind. Finding a deep cavern hollowed from the ice by the action of heat from steam vents, they spent a miserable night within the cave but much better than the open.

They left their refuge as soon as possible in the morning and started down the mountain, the descent taking about half the time it took to climb to the summit. Just before coming to

their camp, Van Trump removed his ice creepers from his tired feet, a mistake since they were still on Paradise Glacier. He lost his footing and went sliding like a shot from a rifle down the mountain into a pile of rock, cutting his leg severely.

The climbers slowly made their way to camp. Sluiskin was nowhere in sight, but the hungry men roasted a marmot their guide had killed and dressed during their absence.

As they were finishing eating they saw Sluiskin approaching camp, head down and weary. "He raised his head," Stevens later wrote, "as he came nearer, and, seeing us for the first time, stopped short, gazed long and fixedly, and then slowly drew near, eyeing us closely the while, as if to see whether we were real flesh and blood of disembodied ghosts fresh from the evil demon of Takhoma."

**WHEN THE MEN** arrived at their base camp at Bear Prairie, by way of the much shorter and safer Nisqually River route, Coleman again was preparing to leave for the mountain. The Englishman was sure his friends had met with some misfortune and hoped that he could give them aid.

Sluiskin left with his family for the Cowlitz while the three white men stayed at Bear Prairie until Van Trump's leg was healed enough for the trek back to Yelm.

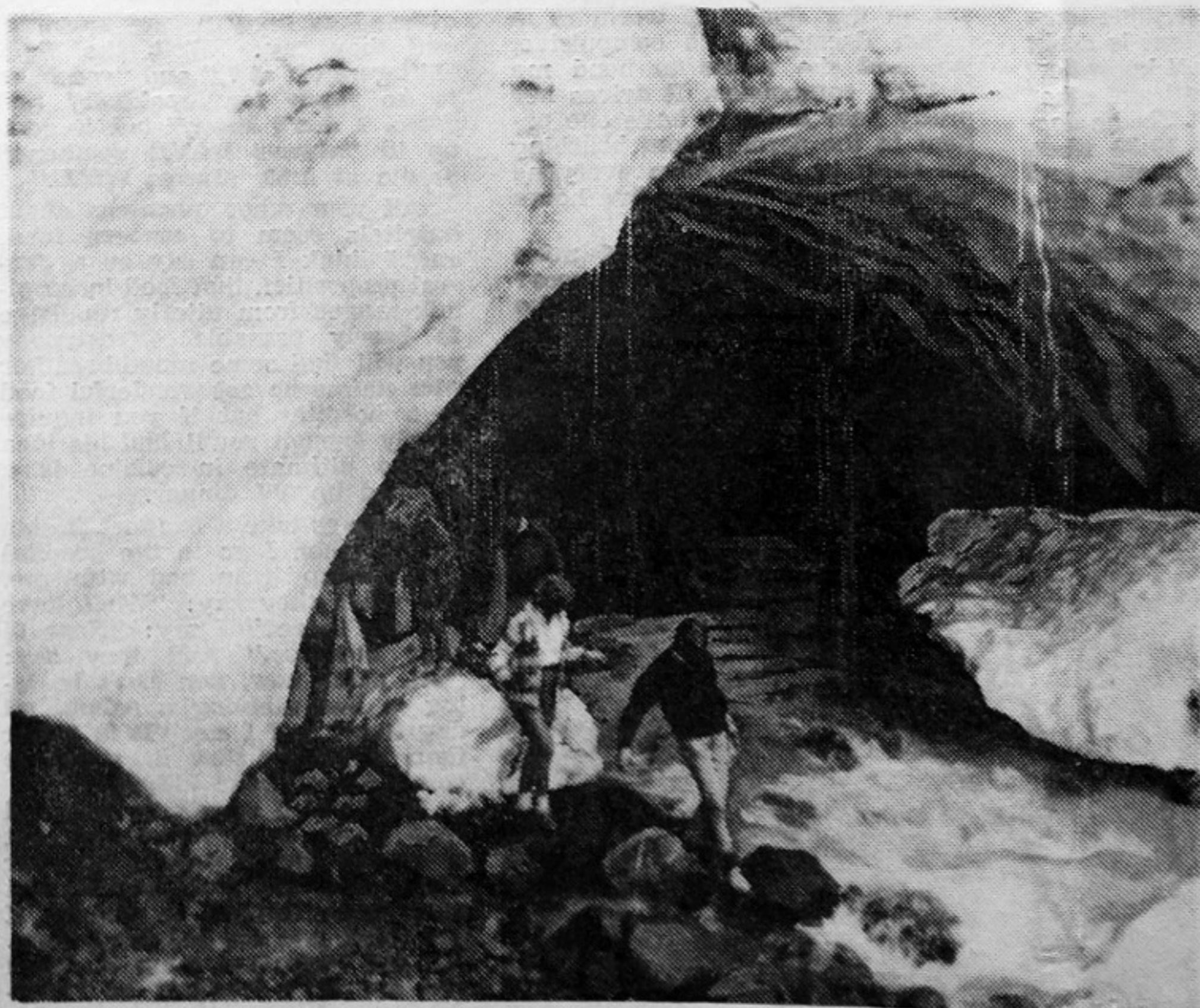
When the trio arrived at Olympia they were given a heroes welcome as the first to conquer the forbidding slopes of majestic Mt. Rainier.

Coleman dropped from the public eye, perhaps a little bitter that he was unable to share the glory of Stevens and Van Trump. General Stevens left for the east without making another visit to the mountain. Van Trump became the true mountaineer, making trip after trip to Mt. Rainier and climbing to its summit many more times. Later he became a guide.

It is almost "routine" to climb Mt. Rainier today. There are many climbing expeditions leaving Paradise Park during the summer and fall climbing season. The route usually used is the one pioneered by Stevens and Van Trump on that August day in 1870.

## THE COVER

A PAIR of young outdoor enthusiasts find the shoreline of Reflection Lake on Mount Rainier a playground of unsurpassed natural beauty. Area around lake today looks little different than it did in 1870 when first two white men to climb Mount Rainier, Van Trump and Stevens, camped here, on the divide between the Cowlitz and Nisqually Rivers, with their Indian guide, Sluiskin. Thousands of tourists yearly now drive and hike to the places the pioneer climbers suffered untold hardships to reach.



THIS IS THE ICE CAVE under the foot of Paradise Glacier. Swift-flowing, cold waters of Paradise River originate under the glacier. Sightseers duck around water

from melting ice above them at cave entrance. Terminus of glacier was just above last camp of Stevens and Van Trump, today is miles further up the mountain.