

1208

DEPARTMENT OF INTERIOR
 UNITED STATES GEOLOGICAL SURVEY
 GEOLOGIC RECORDS

ACCESSION No. 1208 Year 1896

Quad. Mount Rainier
(District or quadrangle name)

Author Smith, G. O.

Index No. G. O. S. 5 Field Records File

Locality L-10 U. S. Geological Survey
(Index map) Geological Division

State Washington Denver

Notes by Smith, G. O.
 Smith, G. O.
 B. Willis

Form 9-728 6-8066 In charge.

U. S. GEOLOGICAL SURVEY.

9-889

Geo. Oles Smith

Washington State

July 1896.

III

Mt. Rainier Reconnaissance Notes

Passing up Carbon River, at the mouth of Canada Creek, is a biotite-hornblende granite, rather coarse-grained, and somewhat resembling the granite of the Cascades. (Specimen not taken.)

At Chetum Falls, a finer-grained, holocrystalline rock appears, an ~~fine~~ aplitic phase of the granite, probably, tho' it may be simply a granitic sandstone. (Spec. not taken, as did not return this way.)

Four or five miles further up the Carbon River, coarse pyroclastics were noted in the cliffs on the N. side of the River. These rocks closely resemble the rock collected west of here on the Spray Park Trail last year.

At the foot of the Carbon Glacier, the rocks of the Mother Range are seen to be plainly bedded volcanics. Crescent Mt. to the east appears to be of the same character. The Mother Range when seen from the south shows the same structural characters, the flows approaching closely horizontal bedding.

- "201/ (July 22.) "201 A gray andesite with rough texture is the predominant rock on the spur below the main mass of Mt. Rainier and between the Winthrop and Carbon Glaciers. It is feldspathic, but varies somewhat in relative amounts of the feldspar and Fe Mg constituents. Slaggy and scoriaceous phases noted, also flow breccia. Platy parting the more prominent. This type of andesite characterizes the "V" south of Moraine Park.

Granite is found at an altitude of 7000-8000' E of the Carbon Glacier and in Moraine Park, where it forms prominent topographic features.

- "203) Above the lateral moraine of the Carbon Glacier at this point, it is the

only rock in place, and this badly jointed, still retains glacial
 grooving. ^(#203) Against this granite are piled the blocks of various lavas.
 In places where a talus from a granite point crosses the slope covered
 with these andesite blocks, the granite appears to have intrusive relation
 but the general relations seem rather those of an old irregular surface
 of granite upon which the lavas were poured forth. This granite
 ridge, which extends E. ward from the Carbon Glacier, explains the
 abundance of granite boulders in the bed of Carbon River.

#204) The granite contains rather more hornblende on the E slope, ^(#204) and is
 everywhere a hornblende granite rather than a biotite granite,

On the E edge of Moraine Park, the granite grades into a rock with
 #205) more of a dioritic aspect; #205. With this lava as in contact, only
 5 ft of the actual contact being hidden by earth which has filled in the
 space left by disintegration at the contact plane. The lower part of

#206) the andesite is scoriaceous, #206, but immediately above is compact, ^{#207} and
 #207) in general composition like that to the SW (201-2), some olivine however being
 present. Above this andesite is platy or flaggy, the parting plane
 being approx. parallel to the horizontal contact with the older rocks, but
 very irregular, and curved surfaces suggesting synclinal troughs.

This granite ridge in Moraine Park, reaching an altitude of over
 7000' is overlooked by the volcanic rocks of the Shuksan Mts and
 the ridge W of the Winthrop Glacier. Furthermore, the contact with
 the volcanic rocks observed is S of the highest part of the granite
 ridge, which runs at about right angles to the Carbon Glacier. These
 relations show that the Rainier lavas were poured over a ridge of granite
 on the side of the volcanic center, standing at a considerable elevation,
 one comparable with that of the granite of the Cascades, which rocks

closely resembles that seen on Moraine Park. This portion of the granite platform of Mt. Rainier presented topographic features of some importance, as seen in the irregularities of V contact plane, differences of elevation which would be seen to be even greater, were it not for the works of erosion.

July 23. 208-210 On V Saw Tooth, the "V" between the Wenthrop & V Emma Glaciers, green & red lavas are found, showing bedding which dips gently from the summit of Rainier. Fragmental material also occurs interstratified with V lavas. These fragmental beds are very coarse agglomerates with boulders like the underlying lava, but also fragments of other lavas. The lava streams as seen in the cliff sections are often lense shaped. The alternation of lavas & pyroclastics is several times repeated, and the exposure of the ^{pink} agglomerates on V NW side of the point is exceedingly fine.

July 25. Mt. Rainier, summit & edge of crater, covered with loose blocks of various lavas, the most abundant type being a black loose textured andesite, with prominent feldspar phenocrysts. abt 2000' in diameter

Gibraltar Rock is composed of varying lavas & fragmentals. Here the most prominent lava is a dark andesitic rock, with glassy feldspar phenocrysts abundant, & resembling somewhat the lavas on Saw Tooth. The bedding of the lavas is nearly horizontal.

July 26-27. On S. end of Little Tahona "V" the black lava with large phenocrysts of feldspar is found. Here the prismatic parting is very finely exhibited, the blocks often resembling pigs of iron in size & shape. They are piled in varying positions, curving masses of such blocks being observed just above the Crowley Glacier.

7
A light red and a gray andesite of much the same composition are found to the N on this same "V". At one point, these grade into each other so that they are seen to be simply phases of the same flow.

On Little Tahona itself occur lavas, agglomerates & breccias which are rather recent appearing. There is much of the "sandstone" parting in some of the rocks here. A radial dike was observed near the point between the V glaciers. The coloring of the surfaces of the blocks of lava and the general appearance of the cliff faces on Little Tahona may indicate ~~the~~ fumarole action at this point.

"216 In the Emmons Glacier, several cumulates project & a gray andesite resembling 201-2 occurs in the cumulate visited.

"217 Along the E slopes of Rainier, in the Parks & on gentle slopes there are accumulations of a light brown pumice, seemingly rather acid in composition. This was first noted in Moraine Park, and in the interior of the Little Tahona "V" was especially abundant, long slopes being wholly covered the fragments of pumice even reaching 8-10 inches in diameter. The question of the source of this pumice was not answered definitely by any facts observed.

"218. A dark purple compact rock with the texture of a porphyrite rather than of an andesite was collected on Thompson's Peak.

"219 July 29. Granite was found on the E side Carbon Glacier, forming a low knob behind the moraine.

"220 This rock the more dioritic in appearance appears in the cumulate in the E and stagnant portion of the V glacier.

These occurrences of the older plutonic rocks indicate a small ridge below & parallel with the one in Moraine Park.

July 30, The Guardian Rocks show a red scoriaeous basaltic lava (see spec. collected last year) overlaid by more compact gray lava. Ropy lava is quite prominent at the 9000' level on Plarnigan Ridge. These Guardian Rocks show the usual inclination of bedding and like the Saw Tooth, Little Tahona, Cathedral and Gibraltar Rocks are doubtless remnants of a V which were interglacial in position and origin.

"221. The ropy lava of Plarnigan Ridge may be in part ejected bombs. It is highly basaltic and quite unlike any lava seen elsewhere.

"222. Below the red basaltic lavas which make up the Guardian Rocks is a spotted light gray rock, exposed on a slopes toward the Willis Glacier.

"223. On the point overlooking the Willis Glacier at about midway of its course is a light gray andesitic porphyry, much more crystalline than most of the Rainier lavas. Like the other gray rocks it shows a platy jointing and the cracking sound when struck.

The lava and pyroclastic sheets usually dip away from the present summit, thus making the present cone sculptured from a much flatter cone. Some exceptions occur in the Cowlitz Glacier region where ^{there are} flat peaks with horizontal beds, or even dipping ^{to} ~~backward~~ ^{the peak} ~~forward~~ ^{the peak}. Also lense shaped lava flows noted, and thus some apparent unconformable relations. This usually observed where lava flows interbedded with agglomerates.

The steepest dip of lava flows noted was that in the Amphitheatre, where in the dividing spur, the dip seems to be abt 30', from the summit. In the outlying ridges and peaks, the bedding is quite flat.

The distribution of the rock types as observed on the slopes of Rainier seems to be radial, probably indicating eruptions of streams rather than sheets. These streams must have been quite extensive, enough to include large segments of the mt., comparable in area with the present interglacial "V₂"

In the collection of rocks on the slopes of Rainier, doubtless only a very small portion of the successive lava flows are to be observed, since the present cone is not sufficiently different in slope from the original cone from which it has been carved. At the Amphitheater at the ~~head~~ of the Carbon Glacier, a good section is exposed, but detailed study at this point would be difficult. On the SW side of Plarminyan Ridge the rock is observed to show only slight variation for considerable vertical & horizontal range, which is perhaps the best case of the radial distribution of the lava.