

*Revised*

# State Department of Geology and Mineral Industries

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Re-investigation of portions of the Geologic Map  
contained in Dogami Bulletin No. 39

*Boulder Butte  
Area & Indian Rock*

Greenhorn Area  
Grant County

**Foreword:**

The following paragraphs summarize the results of an investigation of the geologic conditions prevailing in two different places in the area covered by the geologic map accompanying Dogami Bulletin No. 39. The investigation was made because of criticisms tendered to the Department with respect to the validity of the geology as portrayed on this map. The complaints in question were voiced by Messrs. Erickson of Portland and Gail T. DeWitt of Bates.

The initial criticism was called to Mr. Libbey's attention by Erickson and DeWitt, their contention being to the effect that it was basalt and not granite that was the prevailing rock exposed on the mountain top from Boulder Butte west to the point where the mountain elevations gave way to westward drainage. The involved tract of land included Squaw and Indian Rocks and an estimated total of seven or more square miles in area. Subsequent criticism was expressed to the writer by Mr. DeWitt who maintained that serpentine was abundantly exposed on Caribou Creek in the area directly below the forks. These two areas are each discussed separately under the headings "Boulder Butte-Indian Rock Area" and "Caribou Creek Area".

The present investigation not only confirmed both of the DeWitt-Erickson contentions as outlined above, but in each instance it served to disclose additional errors equally contradictory in nature and far more widespread in area.

BOULDER BUTTE-INDIAN ROCK AREA:

General:

The field work pertaining to this check-up was made in the company of Mr. John Donaldson of Prairie City. Donaldson owns mining claims in T. 9 S., R. 34 E., at the end of the road to the northeast of Squaw Rock as is indicated on the accompanying map. He is familiar with the country over a wide area, and in particular, knows the location of section lines and corners. Donaldson's service in this capacity was especially arranged for by Mr. DeWitt who was himself unable to accompany the writer as was originally planned.

The access road over which Donaldson took the writer to the area is shown on the map by the pen and ink entry. This was taken from the United States forest service map for the area. It is a good mountain road and the trip was easily made in a conventional touring car from the Coyote Creek road to Indian Rock. The road north across Deadwood Creek was not traversed due to lack of time. Otherwise side trips were made in a jeep from Indian Rock to Boulder Butte, and to the Donaldson claims in the Desolation Creek valley. The mountain top terrain covered by the jeep traverse is generally open and much of it can, with the exercise of due care, be crossed by a conventional car with good clearance. In making the foregoing statement the writer does not mean to imply that

all points visited on the jeep traverse with Donaldson could be reached with a standard car. The opposite is very much the case as Donaldson pushed the jeep through much rugged country in order to reach various special landmarks that DeWitt recommended we visit.

George Donaldson also accompanied the party part of the time. George is an employee of the United States forest service and the tracing of property lines constitutes one of his principle tasks. Through this connection he is intimately acquainted with survey locations in this portion of the Greenhorns. George Donaldson is the authority for the bulk of the information by virtue of which the writer extended the reconnaissance area to include the valley's of Big Creek, Deadwood Creek and the South Fork of Desolation Creek as is indicated on the map by the use of parallel lines in contrast to the solid color employed to denote the geologic situation in the area observed first hand.

Attention might well be drawn at this time to the fact that Squaw Rock has been relocated on the accompanying map. This is the correct location according to George Donaldson. Donaldson further stated that Squaw Rock has been incorrectly located at several different places on various past editions of Forest Service land maps, and that his knowledge concerning the present location comes from his having traced section lines and tied the butte in with established section corners.

Geologic

Observations: Corrections to the geologic map as were established, or indicated, by the present investigation, are shown by the colored over-print. ORANGE indicates basic lava; RED, granite, with the

word "granite" being employed here as an abbreviation for the biotite-quartz-diorite listed on the original map. These colors show the distribution of the respective formations named regardless of the identity of the bedrock as indicated by the original map. In short, lava as mapped by the writer covers areas mapped both as granite and as argillite on the original map. The same holds true for the granite, namely, that the granite distribution is extended to include areas formerly mapped as argillite.

The case of Squaw Rock illustrates the point. This prominent landmark is shown as argillite on the original map. In its re-located position it falls in the area originally mapped as granite. Actually, this landmark, and likewise also its companion feature, Indian Rock, is neither argillite nor granite, but basalt, with Indian Rock, at least, exhibiting typical columnar jointing on a scale visible at a great distance.

Considering the area at large, the situation with respect to bedrock identity and distribution is to be summarized as follows. Boulder Butte is comprised of granite as is indicated by the original map, but a thin veneer of basalt caps the butte. Otherwise, however, basalt encircles the western flank of the butte and blankets the mountain summit solidly from this point westward in the manner described by DeWitt and Erickson. This is shown on the attached map by the solid orange overprint. The solid orange color demarks the bounds of territory examined in a firsthand manner with a sufficient number of traverses and check points to warrant relatively positive mapping. The dashed line pattern in the

same color represents territory in which the lava is generally known to extend although details regarding its occurrence there were not checked by means of firsthand observation. With reference to the area mapped by the solid overprint it can be said that the margins of the flows tend to correspond with the topographic margin of the mountain summit, and they often tend to stand out as a rimrock of conspicuous proportions. Nowhere within the bounds of this area was there any observed exposure of granite. Furthermore, the lava area overlaps to an appreciable degree on territory originally mapped as being argillite.

Because of the lava capping the granite is exposed only on the flanks of the mountain. That occurring on the south side of the mountain is apparently limited in its exposure to a relatively narrow east-west trending belt, the southern contact of which is presumed to be as shown on the original map. On the northern flank, however, the granite is not only exposed on the mountain flank directly under the lava, but it appears to continue as the native bedrock for a great distance down the mountain slope, and likewise it appears also to be the prevailing rock on the opposite, or south-facing slope of the Big Creek valley. At least what looked to be granite was readily observable from several different vantage points along the Indian Rock-Squaw Rock rimrock, and both of the Donaldson brothers and DeWitt not only assured the writer that it was, but they each contend that it constitutes the bedrock in the entire Big Creek valley and also in the valley of the lower reaches of the South Fork of Desolation Creek. On the basis of their reports plus my own supporting, though long ranged observations, the presence of granite in this area is indicated on the overprint by the use of the dashed

line pattern (red) meant to represent "probable" occurrence.

In the foregoing connection these informants are admittedly depending upon their recollections in some instances although they all have a record of longstanding and intimate acquaintance with the territory in question. Also, allowance should properly be made for the possibility that some of their observed accumulations of granite boulders in the lower reaches of the mountain slopes and in the heads of the various creeks, could reflect detrital accumulations rather than native, or in situ, bedrock. In short, while it is to be remembered that these informants were correct in all details in the instance of their previous reports, it is conceivable that a conspicuous mantle of detrital granite boulders could divert their attention from a poorly exposed argillite. Thus it could be that some argillite, or other bedrock, does occur in some places in the lower reaches of the valleys in question in spite of their reports to the contrary. In the main, however, the significant point at the moment is that granite does occur in abundance in areas shown as argillite on the Bulletin No. 39 map. This WAS confirmed by firsthand observation in the areas where the granite is shown by use of the solid red overprint.

**Summary:** By way of summarizing this discussion of the BOULDER BUTTE- INDIAN ROCK AREA it can be said this investigation showed that basalt constitutes the prevailing rock type present on the mountain summit; that this basalt covers the bulk of the area shown as granite on this portion of the Bulletin No. 39 map; that this basalt also covers an appreciable amount of territory shown as argillite on this map; that much of the territory mapped as being argillite is in reality granite; and finally, that various evidence points to the

possibility that granite may be present over a far more  
extensive area than was actually confirmed during the course of  
this investigation, said area being otherwise mapped as argillite.

The following series of pictures illustrate most of the pertinent  
points made in the foregoing paragraphs. These pictures mark  
the conclusion of the discussion of the BOULDER BUTTE-INDIAN ROCK  
AREA.



Photograph taken at the site of the ... ..

The ... ..

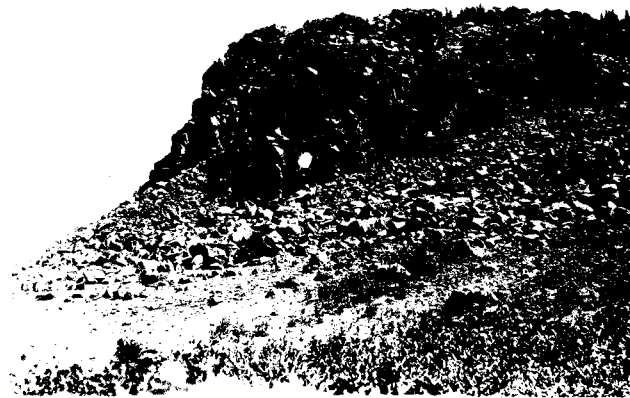
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The following are the names of the various sections of the  
unpublished report of the United States Geological Survey (Division of  
the Forest Service) for the year 1914, which were taken along the line  
extending between "H" and "M". In the various reports, all points of  
interest are given in the following order: H, M, L, N, O, P, Q, R, S, T, U, V, W, X, Y, Z.



There are also some indications of Indian and Spanish Rock. Both pictures were taken from station "B". The upper picture is that of Indian Rock, the lower, Spanish Rock. Both "Rocks" are a part of the same line. It will be seen that they appear to be an integral part of the land surface. The peaks of the mountain are seen in the preceding picture. These are the so-called "Rocks" as being a part of a single, and the bulk of the summit area of granite.





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