July 11, 1944
Bondi's Resort, Bighorn
National Forest, 22 miles
west of Dayton, Wyoming

Subject: PORPHYRITIC DIABASE
Purpose: To determine the location and geologic occurrence of a very strongly porphyritic diabase, locally called "leopard rock" and in use as building and ornamental stone in the immediate vicinity.
Location: The rock has been quarried at a point ½ mile northeast of the Burgess Ranger Station in the SE ¼ Sec. 25, Twp. T. 56 N., R. 89 W., Sheridan County, Wyoming. The locality is a few hundred feet east of the Twin Buttes Campground, Bighorn National Forest.

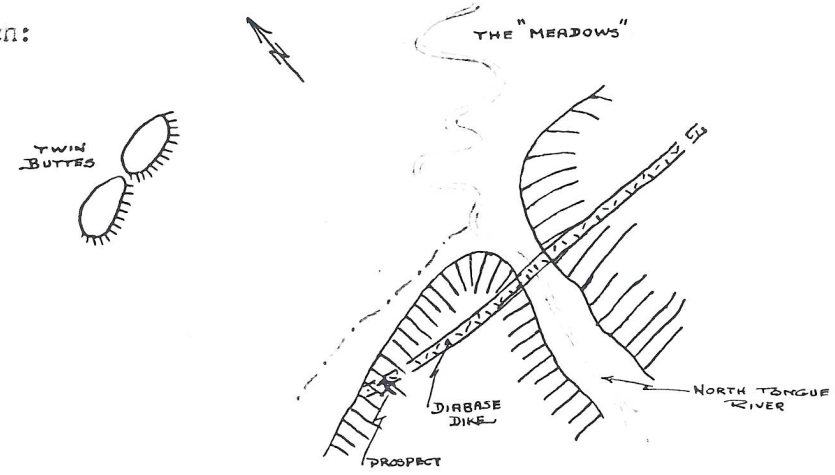
## Observations

The porphyritic diabase occurs as a large dike, at least 100-125 feet thick, cutting typical pink, medium-textured, phaneritic Pre-Cambrian granite. According to Mr. Dickson, ranger at the Burgess Station, this same dike (or an apparently identical one) extends for a long distance and crops out on Cutler Creek about 6 miles east of Twin Buttes. The Cutler Creek mass has been used locally in highway culvert construction and for rip-rap.

To the west of the SE ¼, Sec. 25, the dike is lost under the overlying Paleozoic rocks beneath the westernmost of the two Twin Buttes. To the east of the SE ¼, Sec. 25, the outcrop is intermittent. Where exposed the dike usually forms a conspicuous ridge although its outcrops are heavily timbered.

In the SE ¼, Sec. 25, a prospect hole or quarry has been opened on the dike where the latter is exposed on a spur lying between a small tributary creek which flows past the camp ground and the North Fork of the Tongue River. The general trend of the dike in this locality appears to be nearly E-W. The dike changes in thickness appreciably along the strike and occasionally sends off apophyses ~~from~~ into the surrounding granite.

Sketch:




Within perhaps 8-10 feet of its contact with granite the dike is a dense, black, massive, medium-grained diabase. In sharp contrast its central part is crowded with rather large, uniformly spaced, somewhat rounded, whiteish-green labradorite phenocrysts. In most of the dike interior the phenocrysts comprise 60%-80% of the mass by volume. The phenocrysts average perhaps 1-1½ inches in length though some may exceed 3 inches. Considering their large size the phenocrysts are not very idiomorphic and tend to have rather well-rounded, equidimensional outlines. The plagioclase phenocrysts are very often compound twins, developed on both the Carlsbad and Albite laws. They are not conspicuously embayed or modified by resorption. It is possible that the supposed unit phenocrysts may, at least, in some instances, actually be diversely oriented plagioclase aggregates, thus giving rise to a pseudo-orbicular structure of unusual type. A few phenocrysts carry narrow zones of greenish inclusions 1/8 - 1/4 inch in from their margins.

Considering the dike as a whole there is relatively little variation in the size of the phenocrysts and the interior of the dike is consequently quite uniform in appearance. Upon weathering, the diabase matrix shows the typical interlocking relation of the groundmass plagioclase laths. At and near the dike margins the

phenocrysts are drawn out into rude flow bands, and in these the phenocrysts are conspicuously smaller ($\frac{1}{4}$ - $\frac{1}{2}$ inch) than elsewhere and exhibit some parallelism in orientation.

In places the dike has been sheared along narrow, irregularly spaced, crush zones. In these zones there is some development of slickensides and serpentinous matter with traces of pyrite.

Respectfully submitted,

John C. Haff

Nov. 23, 1945

R. G. Arthur
1650 Plum Creek Road
Sioux City 17, Iowa

Dear Mr. Arthur:

Last summer you inquired on the location of grey granite in Wyoming and at the time I wrote you that it was impossible to give the exact location of a granite once quarried for monument stone. I have now learned that a quarry located in the Washakie National Forest in Sinks Canyon about 10 miles southwest of Lander, Fremont county, was operated for a number of years by H. S. Crispin of Lander. Mr. Crispin died a few years ago and the quarry is no longer being worked. It is located on government land and probably subject to lease.

The granite is light grey in color and made very attractive monuments.

Yours very truly,

H. D. Thomas
State Geologist

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