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THE RIB MOUNTAIN RED GRANITE

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Open-File Report 30-3

4 p.

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[1930?]

## THE RIB MOUNTAIN RED GRANITE

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The stone quarried in the vicinity of Wausau, Wisconsin, and marketed as Rib Mountain Red Granite should take its place as a reddish gray, medium to coarse grained crystalline rock amenable to construction and monumental purposes. From detailed study of the hand specimen and thin sections examined under the polarizing microscope, it appears to have composition, a texture and structure such as to insure permanence of appearance, resistance to the elements, and long-lived structural strength.

### Description of Dress Specimen.

This rock has a soft grayish red hue upon a fresh natural fracture. The red color is distinctive, full of life, but reserved and not gaudy. With polishing, the color darkens materially. The rock takes a nearly perfect polish, and on account of the marked color contrast between even the polished and the natural fracture surface, with still greater color differences when a hammered surface is added, it is amenable to a wide range of effects to be wrought by carving and lettering.

The red color originates in the feldspars which constitute probably close to 75% of the rock. As shown under the microscopic description, there are three varieties of feldspars, and all are to a degree pigmented by a dissemination of red iron oxide. One variety appears richest in this pigment. The size of crystals is not perfectly uniform, nor are the three varieties of feldspar distributed in a manner in any way suggesting the conventional. Hence, the effect is a variegation ranging from the deeper red to delicate pink tints.

The quartz is translucent and varies from white to pearl gray. It constitutes roughly one-quarter of the mineral assemblage. Its crystals are of approximately the same size as the feldspars. They are never assembled into clusters, and being instead, therefore, distributed only very roughly in a regular manner among the more abundant feldspars, their effect is to soften the strong red color of the feldspar. In this connection, also, it is interesting to note the variable expression of the quartz. It is translucent and depending upon the thickness of the individual, and the color of the mineral just behind it, it may transmit some tint of red, always subdued as compared to the color of the actual mineral, or a gray of varying intensity. In most cases the quartz is fractured and the light entering is broken up by reflection from fracture surfaces. The net effect is to soften and only rarely to produce a brilliant reflection. The contacts of quartzes and feldspars are thus also rendered less sharp. Thus, although subordinate in quantity to the feldspar and subdued in expression because of their translucence and diffusion effects, the quartzes play a principal part in the visual effect of the rock surface as a whole.

The proportion of accessory minerals which are dark colored, the magnetite, biotite, and hornblende, is minor. Furthermore, although this suite of minerals is thus of minor importance quantitatively, in their non-uniform distribution and tendency to align themselves into irregular and ill-defined streaks, there is a feature lending potential for additional architectural effects. This linear effect is not prominent, nor does it evidently impose a weakness. Examination of three dimensions shows the organization of these accessory dark minerals to simulate a three dimensional net-work with one long axis greater than the other two. It is this which gives the impression of alignment and an incipient schistosity.

### Microscopic Description.

This section study of this rock demonstrates and corroborates that made upon the hand specimen. The dominating mineral is feldspar and of it there are three varieties, orthoclase, microcline, and a highly alkaline plagioclase. Quartz is in second place in order of importance and is estimated to constitute not over 15%. (In the statements made on the hand specimen description, it will be noted that quartz is irregularly distributed and on this larger scale probably constitutes more nearly  $\frac{1}{2}$  of the entire rock. A single thin section measures not over  $\frac{3}{4}$ " in diameter, and hence is not a true sample.) Magnetite is third in abundance and with biotite and an occasional hornblende and garnet, probably accounts for around 5 per cent.

The texture is medium to coarse grained. The individual feldspar and quartz grains interlock, and none express the external forms so characteristic of these minerals when permitted to crystallize without interference. They mutually interfere. To a degree that the plagioclase has developed more elongate forms, whereas the orthoclase and microcline are more nearly equidimensional, there is the tendency for these minerals to express their crystal habit.

There is everywhere evidence of applied stress. The feldspars are very beautifully flexed in some cases, particularly well shown by the plagioclases. More common is slicing or closely spaced fracturing. The quartz invariably shows the strain shadowing under doubly polarizing light, and in many cases irregular fracturing. Furthermore, the entire assemblage shows a mutual granulation as though by frictional abrasion along intergranular boundaries. Quartz seems to show this most commonly, for the

feldspars were apparently capable of adjustment to stress by slicing and bending, but all show it more or less. However, the failures superposed in response to this stress have been well healed or "welded" by secondary quartz. It is in these intergranular contacts between feldspars or feldspar and quartz that the biotite, hornblende and magnetite occur and the former of these reacted to stress by bending and slipping their plates.

There is exceedingly little evidence of "decay" through processes that are related to the surficial weathering. The beautiful red color which is perhaps the paramount value of the stone is not to be thought of as in any way associated with the rusting of outcrops long exposed to the elements. This red color is directly traceable to a dissemination of mere microscopic points of red iron oxide through the feldspars and principally in the orthoclase. To be sure there is a greater concentration of the pigment in the fractured specimens of feldspar, but it is quite probable that this process closely followed upon the heels of the episode of stress application and ceased with the process of healing or "welding". There is but the merest trace of sericitization or kaolinization, which processes eventually accomplish the reduction of a granite to clay.

#### Summary.

It is from the facts of observation and the interpretations recorded in both the megascopic and microscopic examination that we reach the conclusion that this stone takes its place in construction or monuments in a fresh condition, untouched by agencies of decay and possessed of a structure and texture which can safely be relied upon to preclude their inroads even in places of extreme exposure for a long time.