

## PYROPE GARNET VS. RUBY SPINEL IN KANSAS

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### INTRODUCTION

Exposed igneous rocks in Kansas are rare; the few that do out-crop are limited to very small areas. One of these exposed igneous rock bodies near Stockdale (N. E.  $\frac{1}{4}$  S. E.  $\frac{1}{4}$  Sec. 23, T. 8 S., R. 6 E.) in Riley County, is a serpentized peridotite. This basic rock contains ilmenite, phlogopite, and another mineral that has been called ruby spinel (1).

When the writer first saw the mineral, he suspected that it was pyrope garnet and set out to re-identify the mineral.

A search of geologic literature pertaining to the Stockdale locality has yielded very meager information. Facts about the so-called ruby spinel are even more scarce. Ruby spinel from Kansas is first mentioned in the literature about 1880. Mudge (2) reported the mineral from rock that he called a shale, in the northern part of Riley County; he did not recognize the rock as being igneous. He did not, however, mention any tests that he had made in ascertaining the identity of the mineral.

Failyer and Bailey (3) included ruby spinel from Riley County in their list of Kansas minerals. Professor Sperry (1) of Kansas State College was the first to identify the mineral in definite connection with the Stockdale rock. Carpenter (4) mentioned ruby spinel in a recent paper, but he probably based his identification on previous reports.

The writer visited the Stockdale area in 1940 and procured samples of the red mineral for study. A sample consisting of several grams of fragmentary material was submitted for chemical analysis, and the analysis at the outset confirmed the writer's contention that the mineral was not spinel, for silica was present in large amount.

DESCRIPTION OF MINERAL. Analyses have yielded the following results:

#### COMPOSITION OF RED MINERAL FROM IGNEOUS ROCK EXPOSED NEAR STOCKDALE, KANSAS

SiO <sub>2</sub>	40.42
Al <sub>2</sub> O <sub>3</sub>	21.12
Cr <sub>2</sub> O <sub>3</sub>	7.90
Fe <sub>2</sub> O <sub>3</sub>	10.50
MgO	14.42
CaO	4.71
Total	99.07

A comparison of this analysis with those in Dana's *System of Mineralogy* (5) indicates that the mineral is similar to pyrope garnet. Of chief in-

terest, however, is the amount of chromium which is greater than in any analysis of pyrope garnet given in the tables.

Although the chemical analysis is conclusive proof that the mineral is pyrope garnet, some of the physical properties have likewise been measured. The hardness is 7.5, the specific gravity 3.47, and the refractive index 1.746.

The mineral is found in anhedral to subhedral phenocrysts in the serpentized peridotite. Phenocrysts range from microscopic individuals to grains as much as one centimeter in diameter, but most of the larger masses are fractured, so that whole specimens of that size are uncommon. The mineral is red to reddish brown, transparent to translucent, and has a vitreous to resinous luster. Its streak is white, and its fracture is conchoidal to uneven. It is brittle to friable.

CONCLUSIONS. The chemical analysis proves beyond doubt that the tested specimens of red mineral from the Stockdale rock are pyrope garnet, but the writer does not imply that ruby spinel is absent from the rock. He concludes, however, that most, if not all, of the red mineral is pyrope garnet, and that any identification of a mineral from the Stockdale igneous body as ruby spinel must be verified.

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