

ON THE OCCURRENCE OF A NEW SPECIES OF GARNET AT PORT CYGNET.

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(Plate.)



THE Igneous rock containing this Garnet as a constant accessory constituent, occurs as an outcrop about 6 feet wide on the beach between Port Cygnet and Lymington.

It is intruded between other volcanic rocks, and, as far as could be ascertained from a hasty examination, seems to be the only exposure in this locality. From fossils found it is probably contemporaneous with the Permo-Carboniferous sediments.

The microscopical and chemical examinations of the rock point out its relationship to the Trachyte family, examples of which are so plentiful in this district, and which have been fully described by Messrs. Twelvetrees and Petterd.* Many of the varieties of Trachyte mentioned by them have melanite garnet as an accessory constituent.

The percentage of Si O_2 in this rock does not run very high for a Trachyte, being as low as 55.87%. Trachytes proper often include as much as 62%—64% of Silica.

The Garnets of a brownish-yellow tint are scattered abundantly through the rock, and crystals with well developed trapezoidal faces, measuring sometimes over a quarter of an inch diameter, are plentiful.

Dana (System of Mineralogy, p, 272) says "Garnets containing protoxide of iron often become rusty and disintegrated through the oxidation of the iron, and sometimes are altered more or less completely to limonite, magnetite, or hematite."

These remarks apply to the mineral in question, which, where accessible to the weather, has lost its lustre, and, in many cases, dissolved away. Pseudomorphs (after garnet) of a yellowish-white metallic mineral (undetermined) occur. These are probably iron pyrites.

* On Hauyne Trachyte, &c., in districts of Port Cygnet. Proc. Royal Society, Tas., 1899.

Comparing the analysis of the mineral with the published analysis of the different species of garnet, it will be seen that this is a new variety. In no other recorded types do the oxides of Mn., Mg., and Ca. bear the same proportion to each other, with the exception of some Iron Alumina Garnets, and there the percentage is much lower, being only between 3% and 4% of each base.

The Specific gravity =

Hardness = 7.5. Fusibility = 3.5 about.

I. Analysis of massive Garnet from Brazil.

II. „ „ Garnet, Port Cygnet.

III. „ „ Trachyte „

	I.	II.	III.
SiO ₂	37.23	36.87	55.87
Al O ₃	15.22	7.28	18.21
FeO	26.76	17.12	8.01
MgO	3.14	12.49	.46
CaO	4.31	11.98	4.54
MnO	3.40	13.68	2.61
Na ₂ O	3.36
K ₂ O	5.75
Ignition loss	...	00.29	2.28
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		99.71	101.09
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Macroscopical characteristics of Garnet Trachyte. Bluish-grey in colour on a fresh fractured surface, studded with crystals of garnet.

Microscopical characters.—The holocrystalline ground-mass is made up of lath-shaped sanidine feldspars, the interspaces being filled with brown mica. No Plagioclase seems to be present, or if so, is difficult to distinguish from the sanidine. Carlsbad twins, as well as single individuals, are plentiful. Fluxional arrangement of the feldspars is evident.

Sanidine also is present as phenocrysts, having both tabular and columnar habit, and in some cases shows a zonal tendency. Decomposition of some of the crystals has set in with alteration to muscovite.(?)

The ferro magnesian mineral is a brown Biotite without idiomorphic character. It is strongly pleochroic. Magnetite is sparingly scattered through the ground-mass, and appears to have resulted from the decomposition of the mica, generally accompanying the latter.

The Garnet is in well formed crystals, distributed somewhat unevenly through the rock, colourless in transmitted light. Zonary banding is present, and in many cases augite is enclosed. On the edges of the section brush-like aggregates of a brightly polarising mineral occur. These, we think, may be referred to the soda pyroxene *Ægerine*.

To this new species of garnet we propose to give the name of "Johnstonotite" as a slight token of our appreciation of the valuable, and in many cases, arduous work done by Mr. R. M. Johnston, in the Geology of this Island.
