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*A Mangano-magnesian Magnetite.*

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[Read June 28th, 1888.]

A mineral from New Zealand, said to be chromic iron, presumably from its occurrence with serpentine, being found to contain no chromium, was analysed under my direction by Mr. F. J. Cairns with results given below. The mineral occurs both massive and crystallised in a light yellowish-green serpentine, with which it is so intimately mixed that it was found impossible to pick a specimen for analysis that was entirely pure, though as far as possible the distinct crystals were taken. These crystals are about one-fourth of an inch in diameter, and all noticed have the form of the rhombic dodecahedron. The specific gravity is 4.67, and the colour iron-black.

*Analysis.*

Fe <sub>2</sub> O <sub>3</sub>	...	...	66.71
FeO	...	...	19.62
Mn <sub>3</sub> O <sub>4</sub>	...	...	4.63
MgO	...	...	7.15
CaO	...	...	trace
SiO <sub>2</sub>	...	...	2.38
Total			100.49

The silica is probably not a constituent of the mineral, but comes from the small amount of serpentine that could not be separated. Throwing this out, and with it an equivalent amount of magnesia, and re-calculating to 100 per cent., we have the following as the true composition of the mineral, the atomic ratios also being given :—

Fe <sub>2</sub> O <sub>3</sub>	...	...	69.70	—	.436	} .451
Mn <sub>2</sub> O <sub>3</sub>	...	...	3.82	—	.015	
FeO	...	...	20.50	—	.285	} .431
MnO	...	...	1.50	—	.021	
MgO	...	...	4.98	—	.125	

From these figures the mineral is seen to be a magnetite in which part of the Fe<sub>2</sub>O<sub>3</sub> is replaced by Mn<sub>2</sub>O<sub>3</sub>, and part of the FeO by MnO and MgO.

It may be called a mangano-magnesian-magnetite, a variety not noticed heretofore.