

**TRANSACTIONS**  
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**BY**  
**JAMES HECTOR, C.M.G., M.D., F.R.S.**

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## VI.—CHEMISTRY.

ART. LXI.—*On a New Mineral (Awaruite) from Barn Bay.*

By W. SKEY.

[Read before the Wellington Philosophical Society, 21st October, 1885.]

On the 28th of September two samples, marked Nos. 1 and 2, were transmitted to the laboratory through the Secretary for Mines, as having been obtained by some alluvial miners working near Jackson's Bay, and given by them to the Warden. No. 1 of these parcels, supposed by the contributors to be impure platina, was found not to contain any platina, and to consist entirely of a pure alloy of nickel, iron, and cobalt, in the form of small nuggetty and water-worn grains or scales, perfectly malleable, of a hardness of about 5 and sp. gr. 8.1. Some of these grains have a little lustre, but most of them are dull, owing to a coating of reddish or greenish red oxides. These grains do not reduce copper from its cupreous sulphate, acidulated with muriatic acid. The following is its composition:—

Nickel	..	..	..	..	..	67.68
Cobalt	..	..	..	..	..	.70
Iron	..	..	..	..	..	81.03
Sulphur	..	..	..	..	..	.22
*Silica	..	..	..	..	..	.48
Total						100.00

Its formula is  $2\text{N} + \text{Fe}$ . It is remarkable for the high proportion of nickel therein. The richest natural alloy of nickel of which I can find any notice is *Oktibehite*, from the United States of America; it is  $\text{Ni} + \text{Fe}$ , according to which formula there is 51.22 per cent. of nickel present. This alloy (*Oktibehite*) is of terrestrial origin. Meteoric iron does not often go more than 10 per cent., with a maximum of 20 per cent.; it generally contains carbon.

The New Zealand alloy is undoubtedly of terrestrial origin, and should be found in some basic rock in the vicinity of Barn Bay. The even size of the grains, and their number, together with their richness in nickel and apparent uniformity of composition, support the "terrestrial" theory. The inability of

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\* This has all been set free from combination with one or other of these metals.

this alloy to reduce copper from its acid solution of cupric sulphate, is very singular, as both iron and nickel rapidly effect a reduction, separately. This fact shows that the two metals are (in the alloy) combined with each other, and it shows, besides, the unreliability of the copper test for demonstrating the absence of iron alloys from our rock masses, this test being as yet the only one in use for this purpose. Possibly there is a connection, and a close one, between this alloy and the nickeliferous pyrrhotine of the West Coast, which I identified in 1878.

Nickel some time ago was quoted at 12s. the pound; it is supplanting silver (as nickel-silver) for many purposes, such as for harness.

The mixed sand, or wash No. 2, accompanying the alloy, also contained a similar substance, but in smaller grains, while, besides gold—which has escaped the rough appliances of the miners—it contains two kinds of platina, one markedly ferri-ferrous, the other nearly pure. It besides contains tin ore (cassiterite) in quantity, a fact which it appears the contributors did not suspect. This is a new locality for tin ore, and a great deal further south than are any of our other deposits of this ore. The following is the proportional composition of this sand:—

Nickeliferous alloy	..	..	..	..	24.77
Tin ore	..	..	..	..	32.14
Magnetite	..	..	..	..	19.68
Various	..	..	..	..	23.41
					100.00

ART LXII.—*On Platinum Crystals in the Ironsands of Orepuki Goldfield.* By W. S. HAMILTON.

[Read before the Southland Institute, 26th January, 1886.]

I HAVE obtained several crystals of platinum from this source, which, though minute, are tolerably perfect, one of the largest of which is figured. It is a square flat tablet, very perfect on three sides, but irregular on the fourth, with one corner deformed. The entablature is very distinct on the face presented, but not on the obverse. There are markings on the surface, as if thin squares and parallelograms of metal had been beaten into it, giving it somewhat the appearance of a brick floor, and suggesting a compound crystal built up of smaller

