The two analyses, Nos. 106 and 136, which could not well be tabulated with the rest, are given apart :—

STATION 252, 2740 fathoms (No. 106).

	Total water,			24·90
	Total carbonic acid,			0·38
	Total phosphoric acid extractable by HCl,			0·07
a. In Acetic Acid Extract.	Lime,			0·45
	Magnesia,			0·36
	Soda,			0·60
b. In Hydrochloric Acid Extract from Acetic Acid Residue.	Silica,			7·47
	Lead,	0·01		
	Copper,	0·272		
	Cobalt,	0·25		0·93
	Nickel,	0·40		
	Manganous oxide,			19·39
	Loose oxygen,			3·95
	Lime,			1·33
	Magnesia,			1·42
	Alkalies,			0·34
	Alumina,			8·03
	Ferric oxide,			16·20
c. In Sulphuric Acid Extract from Hydrochloric Acid Residue.	Alumina and ferric oxide,			1·62
	Silica,			0·83
d. Ultimate Residue.	Silicates and Silica,			14·91
				98·18

STATION 276, 2350 fathoms (No. 136).

Water,	9·51
Silica,	19·34
Lime,	8·19
Alumina,	6·36
Ferric oxide,	26·70
Magnesia,	1·79
Manganous oxide,	26·46
Nickel oxide,	1·82
Oxygen,	6·31
	101·48

The analyses Nos. 106 and 136 were undertaken with the view of determining the degree of oxidation of the manganese in the nodules. The results of Dittmar's experiments show that the quantity of peroxide-oxygen in the samples examined by him is slightly greater than what would be required by the assumption that the manganese exists in the state of binoxide.[1] Buchanan arrived at similar results from his analyses of some nodules.[2] We obtained the same result in analysing a nodule from Station 276, 2350 fathoms.[3] In this case we have been able to determine that the oxidation and hydration of the manganese answers approximately to $MnO_2 + \frac{1}{2}H_2O$, and that this hydrated oxide is united with limonite ($2Fe_2O_3 + 3H_2O$), 26·7 per cent. The estimation of peroxide-oxygen was also made by Dr Gibson in nodules from Station 285, 2375 fathoms; the quantity found by him showed that barely all the manganese might exist as peroxide, and he points out that the cobalt, nickel, and thallium, present in the nodules, may also exist as peroxides, and thus account for the excess of oxygen.[4]

We thus arrive at the conclusion that these nodules of iron and manganese must be classed along with the impure variety of manganese known as wad or bog manganese ore. Under this name are included the manganese ores occurring in amorphous and reniform masses, made up, in addition to manganese, largely of a mixture of limonite and sandy materials, together with small percentages of cobalt, nickel, copper, and other substances. They are related to psilomelane under the formula $ROMnO_2 + H_2O$, but are mixtures of different oxides and cannot be considered distinct mineral species. In continental rocks wad or bog manganese occurs often as a deposit formed under water, and has originated from the decomposition of other manganese ores, principally manganese carbonates.

[1] See Analysis No. 106, App. III.
[2] *Proc. Roy. Soc. Edin.*, vol. ix. p. 287, 1877.
[3] See Analysis No. 136, App. III.
[4] See Appendix II.