

ness of the two being about eight inches. The ore also occurs in this vicinity as lenticular pockets and irregular nests in conglomerate, etc., and sometimes forms the cementing material. This latter mode of occurrence is similar to that shown by the red hematites (sometimes highly mangiferous) found at various points in the lower Carboniferous conglomerates of the island near their junction with older strata. The analysis of the overlying limestone has already been given. The ore from this locality is generally a pyrolusite, soft, fine-grained, and sometimes sub-crystalline. It is at some openings mixed with manganite, and the latter ore is abundant at several places in the grits. The minerals associated with the ore are calc spar, barite, films of selenite, and limestone. Analyses by Mr. Hoffman, of the Canadian Geological Survey, show that the ores run as high as 88.9 per cent. of binoxide, and contain an admixture of ferric oxide as low as two-tenths of one per cent. On the Magdalen Islands, the manganese ores are found, according to Mr. Richardson (Geological Survey Report, 1879-80) associated with sand, clay, gypsum, and doleritic rocks of Lower Carboniferous age. From Mr. Hoffman's report, (*ibid.*) the ore is a purely crystalline manganite, yielding on analysis 45.61 of binoxide. I have, however, seen samples of pure pyrolusite from these islands. There do not seem to be any limestones directly connected with these ores, as surveyed by Mr. Richardson, and the locality appears to form an exception to the rule which, so far as my information goes, governs the presence of manganese ores in the Carboniferous of Nova Scotia, viz., the presence of limestone. Possibly in the case of these Magdalen Island ores they may have been derived directly from the dolerite.

From the preceding notes, which cover, I think, all the localities known to yield manganese in this province, it may be inferred that in Nova Scotia there appears to be ground for referring the principal deposits of the ores of manganese to an horizon low down in the Carboniferous marine limestones, and certainly, in most cases, underlying the lowest gypsum beds. That limestones, magnesian and sometimes also mangiferous, appear to be associated with them. I am not prepared to attempt any outline of the process which, in Nova Scotia, appears at some points to have deposited in these strata iron ores, sometimes mangiferous, and at other points ores of manganese frequently very free from iron. The source of the manganese may be looked for in the older strata bordering the Carboniferous sea, or, as Dr. Dawson suggests, its presence in these limestones may be due to the decomposition of volcanic debris proceeding from the contemporaneous igneous vents which produced the Carboniferous traps. Both the older bordering strata, and the limestones and associated strata may have been drawn upon for the deposits of this interesting and useful mineral. The action of magnesian thermal springs may have led to the alteration of the limestones more particularly referred to in the preceding notes. Such an action might lead to the deposition of manganese and iron oxides, as well as of lead and copper ores, all of which are frequently found in them.