different periods of precipitation though the arsenopyrite, pyrite and chalcopyrite were formed chiefly at the last. Cobalt diarsenide (smaltite or safflorite) and arsenopyrite with less pyrite or marcasite are the predominant minerals of the complex. Several others such as niccolite, lollingite, breithauptite are indicated by etching tests and analysis. Native silver and probably native bismuth and chalcopyrite are present in small amounts. There appears to be no reason to suppose that glaucodot is one of the constituents, knowing as we do that arsenopyrite and pyrite are present.

Here, again, the facts point to slow simultaneous precipitation of several minerals from a solution which varied but slowly in composition, the sulpharsenides and sulphides predominating during the last stages of the deposition.

Matildite—Galena intergrowth—O'Brien Mine.

The specimen examined was a small mass of galena in which certain areas were remarkable because of their whiter colour and brighter lustre, and also because of a disturbance of the normal cubic cleavage which in such parts assumes a distorted, roughly rhombohedral form. Microscopic examination of an etched surface (Fig. 28) shows that this last material is an intergrowth of two distinct minerals, of which the ground mass is galena and the included mineral, as shown by the accompanying analysis, is matildite.

	Pb	Bi	Ag	S	Sb	Fe	Total
Per cent.	54.35	20.26	10.11	14.68	.45	.20	100.05
Mol. Ratio.	.2624	.0974	.0937	.4580	.0037	.0036	....
Galena PbS	.2624	....	....	.2624	....	....	....
Matildite $AgBiS_2$	....	.0937	.0937	.1874	....	....	....
Excess	....	.0037	....	.0080	.0037	.0036	....

Specific gravity at 21° C = 7.201.

The somewhat inexact ratios shown by the analysis may be due partly to the difficulties of the chemical separations. The rôle of the iron and antimony found is doubtful. It is evident, however, that the material is essentially an intergrowth of galena and matildite in the approximate proportion of: Galena 62.76, and Matildite, 36.50 per cent.

Paragenesis.—The specimen described was a small mass of the material associated only with galena and traces of calcite, so that it was impossible to ascertain the relationship of matildite to the common minerals of Cobalt.

Microscopic examination of etched surfaces shows that the intergrowth is of a very intimate and uniform character. Any section taken at random, throughout