oxides are identical to within such limits that if the yellow-green be CoO, the grey cannot depart from it by more than the formula $Co_{19}O_{20}$. Such differences as there are, however, seem uniformly to show that the grey has slightly the greater oxygen content of the two.

A further experiment was performed with the yellow-green oxide as follows: freshly prepared yellow-green oxide was reduced to metal with hydrogen and carbon monoxide gas, and brought to constant weight. During the reduction the loss in weight was 21·5% in one case and 21·3% in another, corresponding very well with the reduction of CoO to metallic cobalt which would be 21·3%.

Both the grey and the green CoO are non-magnetic, and the samples of grey prepared by us, as well as those obtained from commercial sources, are homogeneous powders under 100 diameters magnification.

Nearly 1,000 pounds of commercial black cobalt oxide have been given to this laboratory for these experiments, and the parts to follow, by The Deloro Mining and Reduction Co., Deloro, Ontario, to whom we take this opportunity of expressing our thanks. We particularly thank Prof. S. F. Kirkpatrick in this connexion, and as well for many valuable suggestions during the progress of these researches.

The properties of the metal, as prepared by the different methods discussed in this paper, are not considered here, as a discussion of them will form part of the publication of another part of these researches soon to follow under the title, "A Study of the Physical Properties of the Metal Cobalt."