magnetite-hematite intergrowths. The intergrowths are more abundant in the Lautoka sand than in the Vunda River sand. The non-magnetic minerals present are chiefly augite, with occasional grains of hornblende, olivine, hypersthene, biotite, quartz and feldspar.

The temperatures of formation indicated for these mineral intergrowths are unduly high for igneous rocks, and this suggests that in the natural processes giving rise to such intergrowths some additional factor enters to permit such solid solution to exist at temperatures lower than those found in the laboratory studies of Greig and his associates.

MAGNETITE CRYSTALS FROM COPPER CONVERTER

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When one of the copper converters in the smelter of Rhokana Corporation at Nkana, Northern Rhodesia, was taken out of commission for relining recently, a small mass of black crystals was found in the bottom of the converter. Such an occurrence had never been observed before by the operating staff, many of whom have had a lifelong experience in the

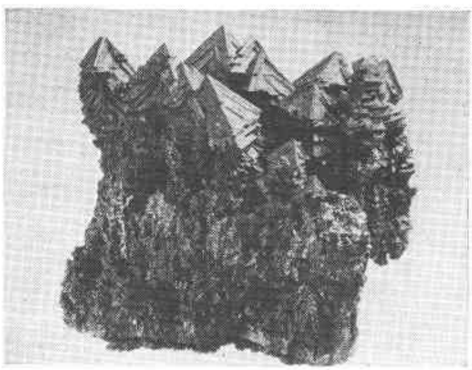

Fig. 1

copper industry, and the crystals were turned over to us for examination. Figure 1 illustrates their general appearance, showing the growth of parallel partial crystals in the direction of the crystallographic axes.

The crystals were black, octahedral, magnetic, with a hardness of approximately 7 and a specific gravity of 4.2. Chemical analysis gave the following result:

	%
SiO_2	7.24
Al_2O_3	3.62
CaO	1.37
MgO	1.50
Cu	6.56
Co	5.28
S	0.22
Fe	51.56

Bearing in mind the temperatures, oxidizing conditions, matte and slag formations in copper converters, with particular reference to Rhokana conditions (2), it is probable that the composition of these crystals is the following:

	%
$3Al_2O_3 \cdot 2SiO_2$	5.0
$CaO \cdot SiO_2$	2.8
$MgO \cdot SiO_2$	3.8
Cu_2S	1.1
CuO	7.1
Co_2O_3	7.4
$FeO \cdot SiO_2$	4.6
Fe_3O_4	68.6
	100.4

The crystals apparently consist of approximately two-thirds magnetite, with the remaining constituents present as impurities or solid solutions.

A surprising feature of our *x*-ray examination was shown by the complete correspondence of the powder photograph of the crystal with a standard photograph of reagent-grade magnetite. There was no indication of any variation in lattice spacing from the values for pure magnetite. This was unexpected, in view of the lower specific gravity for this substance than the value of 5.16–5.18, quoted in mineralogical texts (1) for magnetite. It would be anticipated that the absence of distortion in the lattice would have indicated a specific gravity very similar to that of pure magnetite.

It is well-known, of course, that a low temperature and insufficient silica results in the formation of magnetite in basic copper converters, but this is always an amorphous layer practically indistinguishable from ordinary converter slag. The occurrence, under these conditions, of large crystals of magnetite, which possess the fundamental magnetite structure, though carrying nearly one-third impurities, is, we believe, quite unusual.

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2. YOUNG, R. S., Cobalt, New York, Reinhold Publ. Co., (**1948**).

Esper S. Larsen, Jr., Professor of Petrography at Harvard University since 1923, retired July 1, 1949, and is now residing at 2029 North Kentucky Street, Arlington, Virginia. Dr. Larsen is doing special work for the U. S. Geological Survey. He also has quarters at the U. S. National Museum in Washington, D. C., where he will continue to carry on his own research.

Correction

The dispersion of sengierite as recorded in *Am. Mineral.*, **34**, 112 (1949) should read "$r<v$."

THE MOORE COUNTY METEORITE: A FURTHER STUDY WITH COMMENT ON ITS PRIMORDIAL ENVIRONMENT

H. H. HESS AND E. P. HENDERSON

Errata

Page 495. Table 1, "Moore City" change to "Moore County."
497. Fig. 1, "augite lamellae in pigeonite are parallel to {100} plane," should be changed to "{001} plane."
499. Table 4, optic plane of hypersthene E given as "|| {010}" should be "|| {100}."
502. Line 16. Change "form" to "from."