both at room and liquid nitrogen temperatures. Co^{57} source in copper was used. The data obtained were fitted by a least square iterative procedure to a given number of Lorentzian curves (Figs. 1 and 2) by a computer.

As has been noted by Ghose & Hafner (1968) and Buckley & Wilkins (1971) respectively, for metamorphic and volcanic cummingtonites, small differences in spectra at room (298°K) and liquid nitrogen (77°K) temperatures are observed.

The Mössbauer parameters obtained from the computer output are shown in Table 3. Following the procedure of Bancroft *et al.* (1967), the inner two peaks have been assigned to ferrous iron in the M_4 position, and the outer peaks to ferrous iron in M_1, M_2, M_3 positions. The proportions of iron in M_4 and M_1, M_2, M_3 are calculated (room temperature) from the relation used by Bancroft *et al.* (1967), $A_4/A_{1,2,3} = 0.9\ n_4/n_{1,2,3}$ where A is the peak area, n is the number of ferrous atoms and the subscripts refer to atomic positions. On this basis, the value obtained for ferrous iron is 1.61 in M_4 and 1.51 in M_1, M_2, M_3.

TABLE 3. MÖSSBAUER PARAMETERS OF CUMMINGTONITE

T°K	peak	width	area	doublet	isomer shift	quadrupole shift
298	1	0.40	0.37	1 & 4	1.27	2.87
	2	0.37	0.36			
	3	0.36	0.30	2 & 3	1.21	1.67
	4	0.38	0.32			
77	1	0.52	0.36	1 & 4	1.38	3.16
	2	0.62	0.50			
	3	0.59	0.41	2 & 3	1.33	1.82
	4	0.58	0.39			

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REFERENCES

BANCROFT, G.M., BURNS, R.G. & MADDOCK, A.G. (1967) : Determination of cation distribution in the cummingtonite-grunerite series by Mössbauer spectra. *Amer. Mineral.* **52,** 109-126.

BUCKLEY, A.N. & WILKINS, R.W.T. (1971) : Mössbauer and infrared study of a volcanic amphibole. *Amer. Mineral.* **56,** 90-100.

GHOSE, S. & HAFNER, S.S. (1968) : Mg-Fe distribution over (M_1, M_2, M_3) and M_4 *sites in* cummingtonite. *Geol. Soc. Amer., Ann. Mtg. Prog. Abstr.* 1968, 110-111.

KAMINENI, D.C. (1973) : Petrology and geochemistry of some Archean Metamorphic Rocks near Yellowknife, District of Mackenzie. *Ph. D. Thesis, University of Ottawa.*

KLEIN, C. (1964) : Cummingtonite-grunerite series : A chemical optical and x-ray study. *Amer. Mineral.* **49,** 963-982.

KRETZ, R. (1967) : Study of pegmatitic bodies and enclosing rocks, Yellowknife-Beaulieu region, District of Mackenzie. *Geol. Surv. Can. Bull.* **159,** 109 pp.

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ON THE REPORTED URANITE, URANOCHRE AND URANOCITE OF THE SEYMOUR IRON MINE, MADOC TOWNSHIP, ONTARIO.

H. G. ANSELL AND H. R. STEACY
Geological Survey of Canada, Ottawa

Recent reports on uranium occurrences near Madoc, Ontario (Boyle & Steacy 1973 ; Grasty & Charbonneau 1973 ; Steacy *et al.* 1973) may renew interest in earlier accounts of other occurrences in the area. The purpose of this note is to correct an erroneous report of a secondary uranium mineral at the old Seymour iron mine, lot 11, concession V, Madoc township. The occurrence was first noted in Logan (1863) and reference has been made to it periodically since then.

In his description of the Seymour deposit, Logan (p. 675) notes that "yellow uranite occurs in small quantities in the fissures (in the ore)", and again, in the chapter on mineral species, prepared by T. Sterry Hunt, Logan (p. 504) records under uranium that "uran-ochre, in the form of a sulphur-yellow crystalline crust, has been observed lining fissures in the magnetic iron ore of Madoc". Hoffmann (1886) refers to the mineral as uraconite. Two magnetite-rich specimens from the Seymour mine, carrying yellowish stains similar in colour to that of uranophane and other secondary uranium minerals, and undoubtedly constituting the same material referred to in Logan, are on file in the National Mineral Collection of Canada. One specimen (No. 1923) is marked "magnetite with uranochre" and was collected in 1873 by B. J. Harrington. The other (No. 1651) is marked "uraconite on magnetite"; the collector and date of this latter specimen are unknown, but from the catalogue number, the specimen is evidently of the same vintage as the former.

Although liberally stained yellow, the two specimens are not radioactive. The suspected uranite, uranochre and uraconite proves to be ferrimolybdite, $Fe_2(MoO_4)_3 \cdot 8H_2O$, which occurs as felted crusts and films on the specimen surfaces and as microscopic grains scattered throughout the magnetite. Identification of the surficial material was confirmed by *x*-ray diffraction. Semi-quantitative electron microprobe analysis of the disseminated grains in a polished section of specimen No. 1651, compared against Mo metal and synthetic magnetite as standards, gave approximately 35-40 wt.% Mo and 20 wt.% Fe_2O_3; this compares favourably with the ideal composition of ferrimolybdite, which has 39.1% Mo and 21.7% Fe_2O_3. Six other specimens from the Seymour mine and eight from other contemporary iron mines in the area, available from Geological Survey collections, were also checked, but none was found to be radioactive. Molybdenite, the usual parent mineral of ferrimolybdite, was not observed in any of the specimens, nor in the polished section. However, the mode of occurrence of the ferrimolybdite suggests that molybdenite may have originally occurred, at least in part, as disseminations in the magnetite.

Uraconite was also reported with magnetite from lot 20, concession I of Snowdon township, Haliburton County, Ontario (Harrington 1874). A specimen (No. 1951) available from this location contained yellow jarosite and goethite, and was not radioactive.

The determinative techniques available today may be expected to continue to reveal similar inaccuracies in mineral identification in older literature. In the instance described, the minerals in question were quickly shown to be non-uraniferous by a simple test for radioactivity, a phenomenon which itself was unknown wher. these suspected uranium minerals were first reported in 1863.

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References

Boyle, R.W. & Steacy, H.R. (1973) : An auriferous radioactive hydrocarbon from the Richardson Mine, Eldorado, Ontario. *Geol. Surv. Can. Paper* **73-1,** Pt. A, 282-285.

Grasty, R.L. & Charbonneau, B.W. (1973) : Uranium enrichment associated with the Deloro stock, Southern Ontario. *Geol. Surv. Can. Paper* **73-1,** Pt. B, 49-52.

Harrington, B.J. (1874) : Notes on the iron ores of Canada and their development. *Geol. Surv. Can. Rept. of Progress for 1873-74,* p. 205.

Hoffmann, G.C. (1886) : Chemical contributions to the geology of Canada. *Geol. Surv. Can. New Series,* Vol. II, p. 11T.

Logan, W.E. (1863) : Geology of Canada. *Geol. Surv. Can. Report of Progress,* p. 504 and p. 675.

Steacy, H.R., Boyle, R.W., Charbonneau, B.W. & Grasty, R.L. (1973) : Mineralogical notes on the uranium occurrences at South March and Eldorado, Ontario. *Geol. Surv. Can. Paper* **73-1.** Pt. B., 103-105.

Manuscript received September 1973.

PUBLICATIONS RECEIVED

APPLIED MINERALOGY — VOL. 3: ARC PLASMA TECHNOLOGY IN MATERIALS SCIENCE; D.A. Gerdeman and N.L. Hecht, 206 pp. Springer-Verlag, New York. $23.80U.S.

————VOL. 5: APATITE; D. McConnell, 111 p. Springer-Verlag, New York. $17.40 U.S.

GEOLOGY OF EASTERN NORTH AMERICA; J.D. Schöpf. An annotated translation of Beyträge zur Mineralogischen Kenntniss des Östlichen Theils von Nord-America und seiner Gebürge, 1787, by E.M. Spieker. Collier-Macmillan Canada Ltd. $17.95.

HANDBOOK OF GEOCHEMISTRY, VOL. II, pt. 3. Hard cover binder. Springer-Verlag, New York. $81.80 U.S.

MICROSCOPIC INDENTIFICATION OF CRYSTALS; R.E. Stoiber and S.A. Morse, 278 pp. The Ronald Press Company, 79 Madison Ave., New York 10016. $10.50 U.S.

SYMPOSIUM ON THE BUSHVELD IGNEOUS COMPLEX AND OTHER LAYERED INTRUSIONS; 763 pp. Geol. Soc. South Africa, Special Publication No. 1. Pub. by Geol. Soc.