efflorescences these pre-existing minerals. No direct conversion of rozenite to melanterite and vice-versa has been observed. The stability field of rozenite and melanterite at room temperature as a function of relative humidity is given by Ehlers and Stiles (1965). They have demonstrated that rozenite is the stable phase for humidity conditions less than 70–80%, whereas melanterite is stable at higher values. These experimental results are in agreement with our *in situ* observations.

Thus, both minerals were probably formed by alteration of pyrite and marcasite, while their independent existence could be interpreted as initial formation in places of different humidity.

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Weddellite: a new occurrence

WEDDELLITE, a calcium oxalate hydrate, $CaC_2O_4 \cdot (2+x)H_2O$, was first found in bottom sediments of the Weddell Sea (at 4434–5008 m) (Bannister and Hey, 1936). The mineral occurred as well-formed colourless, tetragonal, bipyramidal crystals, spacegroup $I4/m$, $a = 12.40$ and $c = 7.37$ Å. The crystals were uniaxial (+), $\omega = 1.523$. The mineral has since been observed in other environments as documented by Mandarino and Witt (1983). The most commonly reported occurrences of weddellite are in the bottom sediments of aqueous environments.

Weddellite has now been found in the sediments on Cape Herschel, Ellesmere Island, Northwest Territories. The mineral occurred in trace amounts in black sand lenses of stream sediments and in a raised beach deposit. The stream sands were covered by 3–10 cm of water while the sands on the raised beach were on dry land. Both deposits were made up of subrounded grains and pebbles reworked from glacial debris, but only the sand-sized fraction was examined.

A fine coating of dust on the beach samples was removed, then all the samples were separated into heavy and light fractions. The weddellite occurred in the heavy fraction with garnet, amphibole, biotite, magnetite, ilmenite, pyroxene, hematite, chlorite, dolomite, and aragonite, attached to unknown grains. In the light fraction, it occurred as discrete grains associated with quartz, feldspars and calcite.

Weddellite from Cape Herschel was colourless to orange-brown, and transparent to opaque, with a dull lustre. The grains were subrounded, porous, polycrystalline aggregates ranging from 0.3–0.4 mm, and crumbled easily as a result of weathering. Under the scanning electron microscope the most porous grain charged up, resulting in a poor image with a few poorly resolved shapes which may have been highly weathered crystals of weddellite. The more compact grains were more clearly resolved. These grains were almost completely massive, with a few poorly defined grain boundaries indicating a finely crystalline nature.

X-ray powder diffraction data for weddellite was obtained using a 114.6 mm Gandolfi camera with Cu-$K\alpha$ radiation, then refined by the least-squares method using the cell parameters reported by Marlowe (1970). The refined values were found to be: $a = 12.385(5)$ and $c = 7.365(3)$ Å. These cell parameters are compared with the results of other workers in Table I.

All the weddellite grains were immersed in bromoform, and acetone during preliminary heavy liquid separation, then stored in sealed vials. Some weddellite was later removed for microscope examination, X-ray work and density determination. All of the material removed from the sealed vials dehydrated after one month, and gave an X-ray powder diffraction pattern of whewellite, $CaC_2O_4 \cdot H_2O$. The dry environment of the laboratory and the numerous washings under the microscope lamp were the major factors contributing to the dehydration. The fact that the weddellite lost its water over a short period of time in a dry environment supports the theory of Mandarino and Witt (1983) that the bulk of the water in the weddellite is loosely bonded.

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TABLE I. COMPARISON OF CELL PARAMETERS.

a (Å)	c (Å)	V (Å^3)	c:a	References
12.385 (5)	7.365 (3)	1129.86	0.5946	This Study
12.33 (2)	7.353 (3)	1117.9	0.5964	Mandarino & Witt 1983
12.371 (2)	7.357 (2)	1125.9	0.5947	Tazzoli et al. 1980
12.352 (14)	7.350 (2)	1121.4	0.5950	Tirelli 1977
12.34	7.37	1122.3	0.5972	Slovenec et al. 1973
12.376 (36)	7.348 (10)	1125.62	0.5938	Marlowe* 1970
12.365 (5)	7.340 (5)	1121.3	0.5939	Hutton & Taft 1965
12.30 (2)	7.34 (2)	1110.5	0.5967	Sterling 1965
12.302 (7)	7.381 (3)	1117.0	0.6000	Honnegger 1952
12.375	7.377	1129.7	0.5961	Klassens et al. 1937
12.40 (2)	7.37 (2)	1133.2	0.5944	Bannister & Hey 1936

* Marlowe's x-ray powder-diffraction data (1970) was used by the auther to determine the unit-cell parameters by the least-squares method.

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