the glass forms beads that can either be rolled from the pit or easily loosened with a needle; there is no difficulty through fusion of the glass to the carbon walls under normal condition. The electrodes are also much less expensive than the platinum foil and can be used a dozen or so times without danger of contamination of the glass.

The time required to obtain a glass in the AC arc is only a few seconds, compared with the 7 to 10 minutes required in the flame or electric furnace.

Determinations made to date have been chiefly on plagioclase fragments cut from thin sections of coarse- to medium-grained rocks, but the method works with equal ease for small samples of powdered plagioclase; analyses of the glass have shown that under the conditions used for fusion there is no significant loss of alkalis. The technique is within a single operation of being as simple as the immersion identification of crystalline plagioclase fragments, but reduces the immersion work from the measurement of three indices to only one.

Acknowledgments

The authors wish to acknowledge the assistance of Mr. J. W. VanAlstine in making possible the preliminary fusions on the electrical welder in the National Museum machine shop. Thanks are also due to Survey personnel responsible for the chemical analyses and for the operation of the welding apparatus.

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EUHEDRAL MAGNESITE IN PALAEOZOIC SEDIMENTS FROM SASKATCHEWAN

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Introduction

In 1958, during the drilling of Shell Midale A-6-18-6-10-W2M (about 4 miles S.E. of Weyburn) the wellsite stratigrapher noticed in the drill cuttings numerous small free crystals which were sent to the petrographer (J.E.R.) for identification. They first appeared as the bit penetrated the lower part of the Devonian Winnepegosis formation and persisted intermittently to total depth—about 9550′.

Habit

These crystals are prisms up to 2.0 mm. long, both single and in agregates. Some crystals are transparent and colourless, others are opaque and range from white to deep orange in colour. Frequently there is an abrupt change in one crystal from colourless to orange (Fig. 1). The white

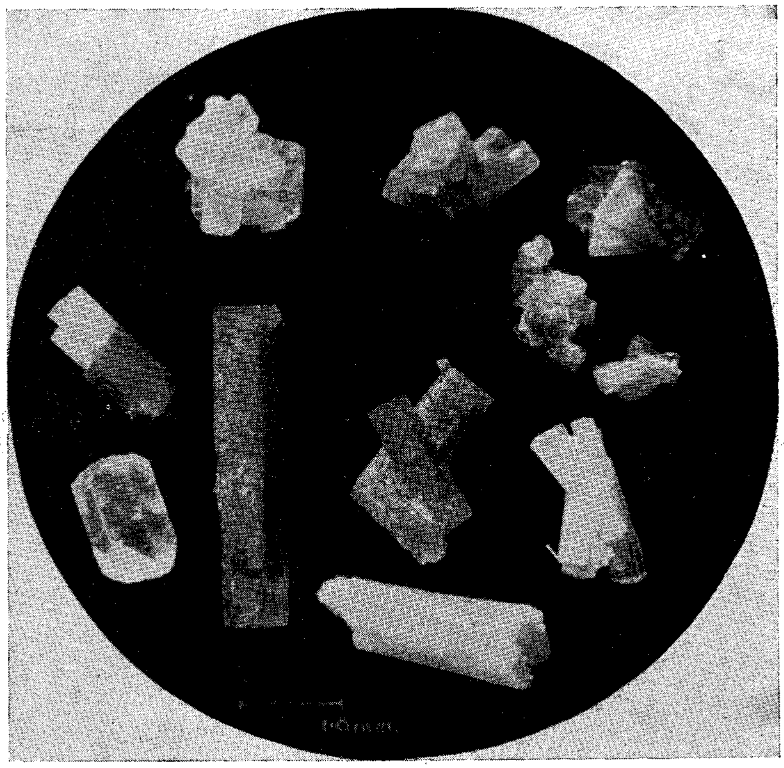

FIG. 1. Magnesite crystals from Lower Palaeozoic sediments.

and colourless varieties have a specific gravity of 2.8; the coloured varieties reach 3.25. There are also dark red crystals filled with numerous specular inclusions which are hematite (confirmed by x-ray analysis).

Mineralogy

An insignificant fraction of the crushed mineral reacted slowly with cold dilute hydrochloric acid. The material treated with acid was washed, dried and examined in oils. The following refractive indices were indicated $\epsilon = 1.525$ to 1.53 $\omega = 1.70$ to 1.71.

The cleavage and optical properties of the mineral were typically those of a carbonate with variation in relief, high birefringence and a uniaxial negative interference figure. Therefore magnesite or magnesio-dolomite was suspected.

The former: pure $MgCO_3$, was confirmed by x-ray analysis.

The occurrence of euhedral magnesite crystals is not common. C. S. Hurlbut & R. E. Taylor (1938) describe some from the Choctaw Salt Dome, Louisiana; Armstrong *et al.* (1951) identify them amongst the Permian evaporites of north-east England. Dr. R. M. Thompson, University of British Columbia, has identified magnesite of similar description "from Silurian and/or Middle Devonian anhydrite beds of the Elk Point formation in Central Saskatchewan" (personal communication). These are possibly from the same horizon as that mentioned in this note.

It was therefore considered of interest to record this occurrence of magnesite. If further details concerning the mineral and its association are forthcoming, it will be interesting to speculate on their origin and formation.

X-ray analysis

The film was obtained from a fine powder mounted in a capillary in a camera of 114.6 mm. diameter with Cu$K\alpha$ radiation. For the clear crystals the following spacings were read.

d(Å)	I		d(Å)	I	
2.75	*vvs*		2.33	*mw*	
2.12	*vvs*		1.95	*s*	
1.70	*vs*		1.82	*vvw*	Q
4.15	*w*	Q	1.78	*w*	
3.75	*vw*	C	1.52	*mw*	
3.55	*vvw*		1.49	*mw*	
3.36	*mw*	Q	1.41	*mw*	
3.05	*vw*	C	1.36	*mw*	
2.51	*m*		1.34	*m*	

v = very s = strong
m = medium w = weak

The clear crystals contained impurities—quartz (Q) and calcite (C). The strong lines are those of magnesite (Fig. 2).

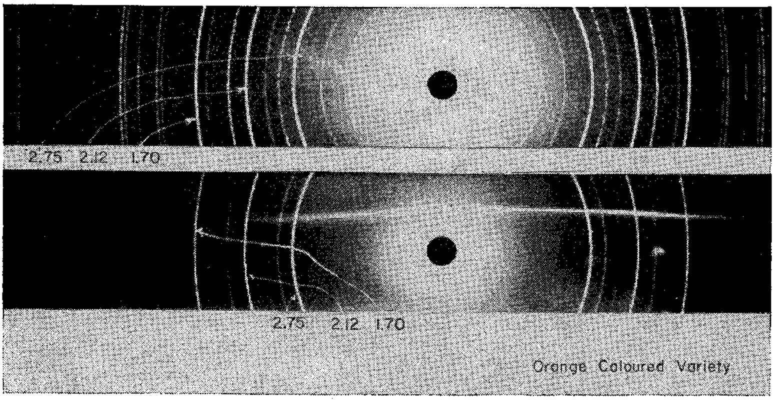

FIG. 2. Magnesite, x-ray powder photographs, half original size. Top—colourless variety, lower—orange coloured variety.

Crystallography

A selection of all varieties of the crystals was sent to Dr. R. B. Ferguson who kindly undertook a morphological study. His report accompanies this paper.

Acknowledgments

W. K. Coughlan and R. B. Hutt originally noticed and picked the mineral from the drill cuttings. The x-ray identifications were made by Dr. R. A. Rowland, Shell Development Company, Houston, Texas.

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THE MORPHOLOGY OF THE MAGNESITE CRYSTALS

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With the help of two graduate students, J. C. Davies and J. M. Patterson, the writer has carried out a morphological examination of the magnesite crystals submitted to us by Miss Rapson.