detectabilities do not apply. Also looked for but not detected: Ag, As, Au, Be, Bi, Cd, Ce, Ga, Ge, Hf, Hg, In, La, Li, Mo, Nb, Pd, Pt, Re, Sb, Sc, Ta, Te, Th, Tl, U, W, Zr.

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HUNTITE, GABBS, NEVADA

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Introduction

Huntite, $Mg_3Ca(CO_3)_4$, first described from Currant Creek, Nevada, (Faust, 1953) has now been identified at Dorog, Hungary (Koblencz and Nemecz, 1953), la Clamouse, France (Baron, et al., 1957), Tea Tree Gully, Australia (Skinner, 1958), Kurgashinkan and Takfon, Russia (Golovanov, 1959), and Crestmore, California (Carpenter, 1961). The purpose of this paper is to report the occurrence of huntite at a new locality; Gabbs, Nevada (Fig. 1).

Geologic Environment

At Gabbs, huntite occurs in the mineralized dolomite of the upper Triassic Luning Formation as defined by Muller and Ferguson (1939, p. 40). The dolomite is exposed on the west flank of the Paradise Range in the upper plate of a major thrust fault, the Paradise Thrust. The mineralization of the dolomite is the result of the intrusion of a series of stocks, bosses, dikes, and sills that range in composition from diorite and andesite to granite. The mineralization has converted large bodies of the dolomite to magnesite and both have subsequently been intruded by granodiorite and in part converted to brucite. Finally, weathering of the brucite has produced a blanket of hydromagnesite and related minerals.

Huntite occurs in veinlets in the fractured and weathered carbonate, near its contact with the hydromagnesite and the brucite, on the east side of the upper brucite quarry (Vitaliano and Callaghan, 1956). The veinlets are 3 to 4 inches wide and can be followed for only a short distance before they pinch out. The samples were collected originally because they were thought to represent poorly consolidated cryptocrystalline magnesite. The huntite is white and massive. It has a subconchoidal fracture, earthy luster, and is easily scratched with a fingernail. As seen

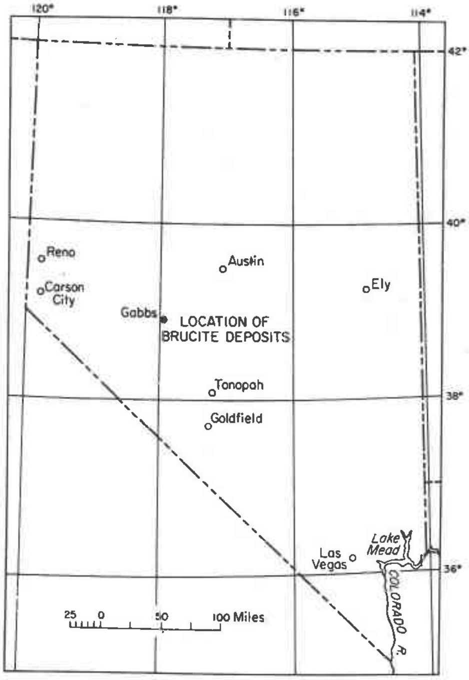

FIG. 1. Index map of Nevada showing location of brucite deposits at Gabbs. Huntite occurs at the east contact of the brucite.

under the microscope the huntite is exceedingly fine grained and fibrous. It is colorless to dusty in plane polarized light, but fluffy with a white cottonlike aspect in reflected light. The diameter of the fibers is generally less than 0.002 mm. Extinction is parallel and elongation is negative. An attempt to determine the refractive index by oil immersion methods gave a value of 1.615. It should be pointed out that this determination was for fibrous aggregates. The value obtained, however, is in good agreement with that reported by Faust (1953, p. 15).

Irregular lenses and patches of a tan semiporcellaneous material with botryoidal habit and a buff massive material containing faint gray-black

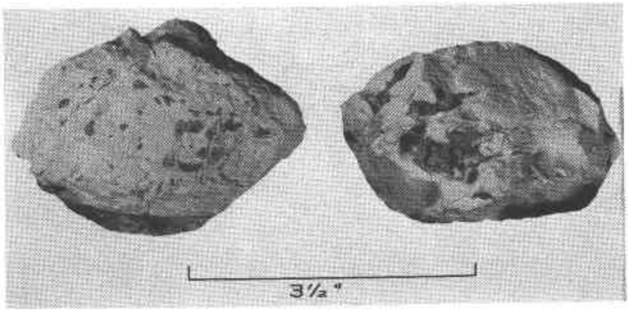

FIG. 2. Huntite (white), showing remnants of dolomite.

streaks occur in the white huntite masses (Fig. 2). The tan and buff materials were examined with the microscope and by x-ray. Each proved to be dolomite. The tan material is fibrous and the buff material broke into excellent cleavage fragments. At room temperature the following refractive index values were obtained on the cleavage fragments:

$$\omega = 1.680$$
$$\epsilon = 1.517$$

The material in the gray-black streaks could not be separated in suffi-

TABLE I. CHEMICAL ANALYSES

	1	2	3	4	5	6	7
CaO	13.53	13.00	13.71	15.42	16.0	16.4	15.40
MgO	36.00	33.81	33.49	34.09	34.4	33.3	34.19
MnO				0.001			
SiO_2		0.42	2.59	0.06		2.1	
Fe_2O_3		0.58	0.05			0.4	
CO_2	49.72	42.86	43.98	48.58	50.4		49.59
SO_3		3.02					
Ignition Loss						48.0	
H_2O+ }	1.14	1.98	3.19	0.86			} 0.56
H_2O- }		4.08	2.37	0.47			
P_2O_5							0.010
Cl					tr		
Insol					Nil.		
Total	100.39	99.75	99.38	99.75	100.8	100.2	99.75
Analyst	P. L. Prikhid'ko	L. D. Danilova	G. Csajaghy	R. E. Stevens	Not given	Not given	M. Coller

1. Huntite, Kurgashinkan Uz. SSR, Golovanov, 1959, p. 129
2. Huntite, Takfon, Tadzhik SSR, Golovanov, 1959, p. 129
3. Huntite, Dorog, Hungary, Koblencz and Nemecz, 1953
4. Huntite, Currant Creek, Nevada, Faust, 1953, p. 22
5. Huntite, Tea Tree Gully, So. Australia, Skinner, 1958, p. 160
6. Huntite, la Clamouse (l'Herault), France, Baron, *et al.*, 1957, p. 160
7. Huntite, Gabbs, Nevada

cient quantity for any precise determination, but isolated fragments found mixed with the dolomite cleavage fragments proved to be antigorite.

Chemical Analysis

A chemical analysis of the huntite from Gabbs, Nevada, is given in Table I, No. 7. In general it agrees well with the analyses of huntite from the other localities. The major components, CaO, MgO and CO_2, are in good agreement with the values reported from Currant Creek, Nevada and Tea Tree Gully, Australia. CaO, however, is somewhat higher in the material from Gabbs than it is in the samples from Kurgashinkan, Uz. SSR, Tadzhik SSR, and Dorog, Hungary, and CO_2 is somewhat higher in the huntite from Gabbs than in the samples from Takfon and Durog. The molecular ratio of CaO:MgO:CO_2 is 1.00:3.09:4.10 for Gabbs huntite.

Table II. Spectrographic Analyses

		1	2	3
				.0X–.00X
	Si		0.0042	[1]
Traces of	Se	X		—
	Fe	X	<0.01	[1]
	Sr	X	0.098	[1]
	Ba	<X	0.076	[1]
	Ti	X	<0.001	[1]
	Al	X	<0.001	[1]
	Mn	X	<0.001	[1]
	B			—
	Cu		0.0002	[1]
	Zr		0.0001	[1]

1. Kurgashinkan, Uz. SSR, Z. M. Lopott, analyst X = occurring in hundredths of 1.0%
2. Gabbs, Nevada, Ma Ma Lay, Analyst, Indiana Geological Survey, Bloomington, Indiana
3. Currant Creek, Nevada, K. J. Murata, Analyst.

[1] present.

A spectrographic analysis for trace elements in the huntite from Gabbs is given in Table II, No. 2. For comparison the spectrographic analysis of the huntite from Kurgashinkan, Uz. SSR, is also given in Table II, No. 1. Notable traces of Sr and Ba were detected in the material from Gabbs, whereas Si content is very small. The only other occurrence in which comparably small percentages of SiO_2 are reported is from Currant Creek (Table II).

TABLE III. *X*-RAY ANALYSES

1		2		3		4
d	I	d	I	d	I	d
5.66	6	5.69	VVVVW	5.64	W	5.66
4.75	4	4.81	VVVVW	4.73	VW	4.75
4.16	2	4.16	VVVVW			
3.64	2	3.67	VVVVW	3.63	W	3.64
3.52	2					3.53
3.20	2					
3.15	4	3.15	VVVVW	3.12	VVW	
2.89	43	2.905	W	2.89	M	2.88
2.83	100	2.838	VVS	2.830	VVS	2.83
2.74	7			2.74	VW	2.74
2.605	20	2.58	M	2.598	M	2.604
2.427	20	2.444	M	2.443	M	2.432
2.372	17	2.388	M	2.372	M	2.375
2.285	10	2.298	W	2.279	W	2.284
2.190	15	2.204	M	2.188	M	2.190
1.992	20			1.998	W	1.991
1.973	45	1.986	S[1]	1.966	VS	1.972
1.894	3	1.900	VVW	1.895	VVW	1.896
				1.888	VW	
1.840	7	1.840	VVW	1.832	W	1.835
1.821	7	1.803	VVW	1.818	VW	1.821
1.793	4			1.793	W	1.796
1.765	40	1.769	S	1.762	VS	1.765
1.750	35			1.752	VS	1.757
1.700	5	1.708	VVW	1.696	M	1.700
1.654	2			1.651	VW	1.656
1.608	2			1.608	VVW	present
1.584	14	1.590	M	1.581	M	1.584
1.522	5	1.529	VW	1.523	VW	1.526

1. Huntite, Gabbs, Nevada
2. Huntite, Currant Creek, Nevada, Faust, 1953 ([1]=doublet)
3. Huntite, Tea Tree Gully, South Australia, Skinner, 1958
4. Huntite, Currant Creek, Nevada, Graf and Bradley, 1962.

X-RAY POWDER DIFFRACTION DATA

X-ray powder diffraction data were obtained for the Gabbs, Nevada huntite by the diffractometer technique using filtered copper radiation. The data for the *d*-spacings and intensities are given in Table III, No. 1. The corresponding data from Faust (1953), Skinner (1958) and Graf and Bradley (1962) are also listed in Table III for comparison. The spacing agreement is good in all cases, and best with the observed values as well as with the calculated values of Graf and Bradley.

Origin

At Gabbs, Nevada, the huntite is restricted to veinlets and it appears to have been precipitated from solutions percolating downward from the surface. In the large quarries that have been opened in the brucite deposits the huntite veins do not continue below the zone of weathering in the carbonate rocks. Drilling in the magnesite, dolomite and brucite deposits in the area has been extensive, but very little of the weathered zone was ever preserved in the core samples. Nevertheless, the huntite appears to be restricted in its occurrence to the vicinity of the brucite contact.

At Currant Creek, Nevada, huntite was deposited at shallow depths by late stage meteoric solutions. Deposition occurred in vugs in the base of replaced volcanic tuff (Faust, 1953, p. 8). At la Clamouse, huntite occurs as "montmilch" in la Grotte de la Clamouse (Baron, *et al.*, 1957, p. 92), and near Tea Tree Gully huntite has never been observed at depths greater than 30 feet below the surface (Skinner, 1958, p. 160). It is felt, therefore, that the huntite in the Gabbs occurrence is also limited to very shallow depths in the zone of weathering and that it has been precipitated in fissures by late stage meteoric solutions.

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