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cements. The iron compounds in a cement are resistive to hydration. Iron does not form crystalline hydration products, but occurs as a rust-like material.

The initial set of cement is affected by the action of small amounts of electrolytes in retarding coagulation of the aluminate material. With a limited amount of water, such as used in normal consistency mixes, the aluminates coagulate and separate from supersaturated solutions as amorphous bodies, the rate of coagulation being affected by such small quantities of electrolyte as to nullify the possibility of the reaction being solely a chemical one.

Failure of cement in accelerated tests is due to the growth of large lime hydrate crystals. The disrupting action results from the pressure caused by growing crystals. Cements will fail in the boiling test which contain lime sufficiently fine and high burned, so that during boiling it hydrates and crystallizes. The growth of crystals is sufficient to cause disintegration. When a cement passes the boiling test but not the autoclave test, it contains lime so coarse or high burned as not to hydrate in the boiling test, but only in the autoclave, due to the high temperature and pressure employed. Some cements will pass either test only after ageing. In this case aeration with insufficient water to allow solution and crystallization causes the lime to hydrate as amorphous hydrate, and in the accelerated tests there is no crystallization and no disintegration.

The reactions when cement is subjected to the autoclave test are not abnormal. The disintegration action attributed to the crystallization of the sulpho-aluminate has been greatly exaggerated.

MINERALOGY.—*Pintadoite and uvanite, two new vanadium minerals from Utah: A preliminary note.* FRANK L. HESS and WALDEMAR T. SCHALLER, Geological Survey.

During an investigation in the fall of 1913 by Frank L. Hess and B. S. Butler of that part of the central plateau uranium-vanadium field which lies in Utah, a number of uranium and vanadium minerals hitherto undescribed or little known were

found. Some of the minerals are so mixed with impurities and are in such fine particles that mechanical separation is practically impossible and their optical characteristics can be determined only very imperfectly.

Fairly satisfactory determinations have been made of two of these minerals which have proved to be new species and it is the object of this paper to place them on record. Like most of the uranium and vanadium minerals of this field, they are highly oxidized and are hydrous. One, a green hydrous calcium vanadate, has been called *pintadoite* (peen-tä′-do-ite) from Canyon Pintado, in which it is found. The other, a hydrous uranium vanadate has been named *uvanite* (yu′-van-ite), a word derived from the words *u*ranium and *va*nadium.

Pintadoite forms a thin green efflorescence upon the face of cliffs of sandstone belonging to the McElmo formation, which are protected by overhanging ledges from the weather. It forms circular or rounded patches like the lichens common on rocks, and though in general of a rich dark green color, many patches are in part lighter green and contain a little yellowish or salmon colored material, which may be pascoite. The contrast with the creamy or nearly white sandstones is striking and very pretty. Being a thin efflorescence it is naturally mixed with gypsum, quartz and other minerals of the sandstone. The specimen analyzed is from the Frisco No. 2 claim, on the north side of Cañon Pintado,[1] San Juan County, about 15 miles by road, northeast of Monticello, Utah, and is the dark green material. Pintadoite has also been found at numerous other places in southeastern Utah.

The mineral shows no crystal boundaries when examined microscopically, is slightly pleochroic in yellow-green, and has a moderate to high birefringence. It dissolves slowly in cold water from which it recrystallizes in twinned, lath-shaped crystals.

The analysis, by W. T. Schaller, after deducting insoluble gangue (sandstone), soluble gypsum, and reduction to 100 per cent, is given below:

[1] Locally known as East Canyon.

Analysis and ratios of pintadoite

	ANALYSIS	RATIOS	CALCULATED
CaO	22.6	0.40 or 1.87 or 2 × 0.94	24.56
V_2O_5	42.4	0.23 or 1.08 or 1 × 1.08	39.91
H_2O	35.0	1.94 or 9.07 or 9 × 1.01	35.53
	100.0		100.0

The ratios of the analysis yield the formula $2CaO.V_2O_5.9H_2O$.

Uvanite is a brownish-yellow hydrous uranium vanadate. Its mode of occurrence is similar to that of carnotite which it resembles in general appearance, but it has not such a clear bright yellow color. It has been found only at, and in the vicinity of, Temple Rock on the San Rafael Swell, Emery County, about 45 miles southwest of Greenriver, Utah. It occurs in rocks which are probably the equivalent of the upper part of the Dolores formation. Some masses of the new mineral are a centimeter thick, but these are rather rare. The mineral occurs in sufficient quantity to be of economic importance.

Examined microscopically, uvanite is seen to consist of very minute crystalline particles with a very high birefringence. The mineral is not soluble in water but dissolves very quickly in a solution of ammonium carbonate.

The analysis by W. T. Schaller is as follows:

Analysis and ratios of uvanite

	ANALYSIS	RATIOS
Insoluble	1.24	
UO_3	39.60	0.139
CaO	1.73	0.031
K_2O	0.30	0.003
MgO	0.04	
V_2O_5	37.70	0.207
P_2O_5	0.06	0.001
As_2O_5	0.05	
H_2O	18.28	1.106
	99.00	

In deducing a formula from the analysis, some uncertainty is felt in regard to the lime and potash. If these be present as ad-

mixed tyuyamunite and carnotite, then there must be present 35 per cent of these two minerals. As, however, special tests showed that both tyuyamunite and carnotite are insoluble in ammonium carbonate solution whereas the material analyzed dissolves therein with great ease and readiness, the assumption that the lime and potash present are due to these two minerals is disproved. It is not known whether the lime and potash are derived from the gangue or belong to the uvanite. The ratios deduced on the basis of either assumption are the same.

Ratios of uvanite analysis

NEGLECTING $CaO + K_2O$			COMBINING $CaO + K_2O$ WITH UO_3		
UO_3	0.139 or	1.91 or 2×0.96	UO_3	0.150 or	2.05 or 2×1.03
V_2O_5	0.208 or	2.86 or 3×0.95	V_2O_5	0.208 or	2.84 or 3×0.95
H_2O	1.106 or	15.22 or 15×1.01	H_2O	1.106 or	15.11 or 15×1.01

The formula derived for uvanite is $2UO_3.3V_2O_5.15H_2O$.

Analysis of another mineral from the south side of Temple Rock, Emery County, Utah, which occurs in shaley sandstone as small greenish-yellow, glistening scales, has shown it to be like uvanite, a hydrous uranium vanadate. Further investigation is being made to determine whether it is a new species or a variety of uvanite.

Pascoite[2] has been found in small quantity on the Crescent No. 3 claim, Crescent Creek, Henry Mountains, and at a number of other places in southeastern Utah, as an efflorescence (already mentioned) and in cavities in fossil wood.

ZOOLOGY.—*The relation between recent crinoids and the temperature of their habitat.* AUSTIN H. CLARK, National Museum.

I have already discussed at considerable length[1] the relation between the recent crinoids and the temperature of the water in

[1] Une étude philosophique de la relation entre les crinoïdes actuels et la température de leur habitat. Bulletin No. 294 de l'Institut Océanographique. Monaco, 1914.

[2] Hillebrand, W. F., Merwin, H. E., and Wright, F. E. Hewettite, metahewettite and pascoite, hydrous calcium vanadates. Proc. Am. Philos. Soc., **53**: 31–54. 1914.