hesion reactions, suggesting that antibody to cardiolipin can participate in the adhesion. On the other hand, human syphilitic serums that were rendered negative to standard flocculation tests by absorption with cardiolipin remained adhesion positive, some of the absorbed serums showing a decrease in the degree of adhesion and others not. Also, some human serums from old, treated cases of syphilis that gave negative flocculation tests but positive treponemal immobilization tests showed adhesion. These observations probably indicate that more than a single antibody is capable of inducing adhesion.

The presence of antibody against bacterial indicator particles such as *S. pyogenes, S. lactis,* or *E. coli* did not interfere with adhesion to the treponemes. This was determined by comparison of adhesion with individual syphilitic serums before and after absorption with bacteria. A high-titer agglutinating rabbit antiserum against *E. coli* caused no adhesion between *E. coli* and *T. pallidum,* either with or without added guinea pig serum, and numerous nonsyphilitic human serums that contained *E. coli* or streptococcal agglutinins did not cause adhesion of *T. pallidum* to the respective bacteria. Thus, while the bacteria can serve in the treponemal system, the treponemes do not seem to act readily as adhering particles in the bacterial antibody serums.

Nelson (*4*) has described as "immune adherence" a reaction involving a mixture of immune serum, human red cells, complement, and treponemes in which, presumably, adhesion is measured indirectly by the disappearance of treponemes from the suspension after centrifugation. This reaction was differentiated from the Rieckenberg phenomenon by Nelson on the basis of its occurrence only with human erythrocytes and its failure with platelets, white cells, charcoal, magnesium silicate, and suspensions of *Candida albicans.* In this connection, it is pertinent to recall the earlier work of English investigators (*8*) who labeled as "red cell adhesion" their observations of the regular ability of primate red cells to adhere to trypanosomes in the presence of complement and specific antibody. These workers and Raffel (*9*) found only an occasional rabbit, guinea pig, or rat that possessed erythrocytes capable of adhesion in the trypanosomal system, but they considered "red cell adhesion" to be an example of Rieckenberg adhesion. We have not seen unaltered sheep, rabbit, guinea pig, or chicken red cells adherent to *T. pallidum,* but these various kinds of cells, after lysis with distilled water, do yield ghosts that readily act as adhering particles. Our observations and the literature cited make it logical to conclude that "immune adherence" with human red cells is simply a particular case of a general phenomenon—namely, adhesion of the Rieckenberg type.

CARL LAMANNA
DAVID H. HOLLANDER
Department of Microbiology, Johns Hopkins University School of Hygiene and Pubic Health, Baltimore, Maryland

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9 December 1955

Duttonite, New Vanadium Mineral from Peanut Mine, Montrose County, Colorado

Duttonite, $VO(OH)_2$, is a new mineral found in the Peanut Mine, Montrose County, Colo. (*1*). It is named in honor of Clarence Edward Dutton (1841–1912), who was one of the first geologists working in the Colorado Plateau region and who was a member of the U.S. Geological Survey from 1879 to 1891. The Peanut Mine is a vanadium-uranium deposit in the upper ore-bearing sandstone of the Salt Wash sandstone member of the Morrison formation of late Jurassic age. Ore bodies occur along the flanks of a buried channel and are localized by a crossbedding structure that is associated with the channels.

Most of the ore at the Peanut Mine is unoxidized, and the principal ore minerals are montroseite, paramontroseite (*2*), vanadiferous silicates, uraninite, and coffinite. The ore minerals impregnate sandstone and replace coalified wood. Along fractures in the ore-bearing sandstone there is commonly a thin massive coating of an undescribed vanadium oxide. On this coating duttonite occurs as crusts and coatings of randomly oriented, 6-sided platy crystals. The crystals range in size from extremely minute to about 0.5 mm in the longest dimension. Associated minerals are melanovanadite and abundant crystals of hexagonal native selenium.

Duttonite is light brown and has a vitreous luster. The hardness is about 2.5. The calculated specific gravity is 3.24. The optical properties of duttonite indicate orthorhombic symmetry. It is biaxial positive; 2V is about 60°; and the dispersion is $r < v$, moderate. $X = a$ (pale pinkish brown); $Y = c$ (pale yellow brown); $Z = b$ (pale brown); $\alpha = 1.810 \pm 0.003$; $\beta = 1.900 \pm 0.003$; and $\gamma > 2.01$. The optical properties of duttonite are very close to those of uvanite (*3*), but the two minerals differ both in composition and occurrence. Duttonite is an early oxidation product of montroseite ore, whereas uvanite ($U_2V_6O_{21} \cdot 15H_2O$) occurs in highly oxidized ore.

The chemical analysis by one of us (R. M.) shows V_2O_3, 2.6 percent; V_2O_4, 75.3 percent; FeO, 0.4 percent; H_2O, 18.1 percent; and insoluble material, 4.2 percent; total, 100.6 percent. The chemical analysis confirms the formula $VO(OH)_2$ that was first arrived at through crystal structure determination (*4*).

The unit-cell constants of duttonite were measured by M. E. Mrose of the U.S. Geological Survey as follows: monoclinic, $a_0 = 8.80 \pm 0.02$ A, $b_0 = 3.95 \pm 0.01$ A, $c_0 = 5.96 \pm 0.02$ A, $\beta = 90°\ 40' \pm 5'$. The space group is $I\,2/c$, (C_{2h}^6), the cell contents are 4 $VO(OH)_2$. The crystals are strongly pseudoorthorhombic, and the structure departs only slightly from the space group Imcm.

MARY E. THOMPSON
CARL H. ROACH
ROBERT MEYROWITZ
U.S. Geological Survey, Grand Junction, Colorado

References and Notes

1. Duttonite was found by one of us (C.H.R.) in the course of a study of the geology and mineralogy of the Peanut Mine as part of the program being conducted by the U.S. Geological Survey on behalf of the Division of Raw Materials of the U.S. Atomic Energy Commission. The publication of this paper was authorized by the director, U.S. Geological Survey.
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21 November 1955

Lack of Recognition of Foreign Works

I have noted with increasing alarm a tendency of American scientists to practice a form of nationalism that scarce does credit to science. I refer to refer-