

a primary dunitic magma from which many types of igneous rocks could be derived by elemental transformation. Olivine, which he regards as the original mineral, can be converted, through changes in the magnesium molecule, into any of the following: anorthite, albite, corundum, pyrope, enstatite, serpentine, spinel, nepheline, or orthoclase. Thus from dunitic are derivable peridotite, pyroxenite, picrite, gabbro, basalt, diabase, serpentinite, albitite, essexite-basalt, atlantite, theralite, and nepheline syenite, among others.

The problems of serpentinization and the origin of feldspathoidal rocks are also examined from the viewpoint of the new hypothesis. The author rejects the idea that serpentine results from the action of water on olivine-rich rocks and substitutes the transformation reaction: $Mg=4H+O+\text{energy}$. The source of the feldspathoidal magma lies in the transformation previously cited, that of two molecules of magnesium into one of sodium and one of aluminum, by means of which olivine is changed to nepheline. According to the author this transformation "plays an unusually important role with respect to Ca and Mg in the life of the planet, for it postulates the origin of the alkalic aluminosilicate magmas."

Professor Efremov has presented some highly original thoughts on various petrological problems, and his hypothesis makes interesting reading. His enthusiasm for his brainchild is boundless, as witnessed by the following statement made in rejecting Bowen's theory of crystal differentiation: "These inadequacies (of Bowen's theory) are lacking in the hypothesis of heteromorphosis, for it devises an interpretation for all our known petrological and geological phenomena with striking simplicity and elegance." The chief weakness of the concept seems to lie in the assumption that atomic transmutation, other than radioactivity, is of a common and widespread occurrence within the earth. Under laboratory conditions enormous quantities of energy are required for elemental transformation, yet the author fails even to speculate regarding possible conditions for this phenomenon on a geological scale. The organizational pattern of the treatise is somewhat haphazard and increases the difficulty of following the sometimes abstruse argumentation. Most of the illustrations are only remotely concerned with the ideas advanced in the text.

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NEW MINERAL NAMES

Apoanalcite

CHRISTOFFER OFTEDAHL, Apoanalcite, a new mineral. *Norsk Geol. Tidsskrift*, **26**, 215-218 (1947).

PHYSICAL PROPERTIES: Red, massive, slightly columnar. Optically positive, uniaxial, $n_E=1.487$, $n_O=1.475$.

CHEMICAL PROPERTIES: Analysis by Lars Lund (on 0.2 g. for the main portion and on 0.13 g. for alkalis): SiO_2 41.2, Al_2O_3 34.0, CaO 0.7., Na_2O 12.2, K_2O tr., H_2O 11.7; sum 99.8%. This gives $Na_{0.92}Ca_{0.03}Al_{1.55}Si_{1.59}O_6 \cdot 1.51 H_2O$. The mineral therefore does not correspond to the normal zeolite type, in which each Al replacing Si is balanced by one Na. Dehydration study by Lars Lund gave a curve with a sharp break, 1.01% being lost at 300° , 9.40% at 420° .

OCCURRENCE: In an erratic boulder of syenite pegmatite in a gravel pit at Voksen, 5 km. N. W. of Oslo. The specimen contains chiefly gray micro-perthite with some aegirine and biotite crystals. It is suggested that some of the massive red "natrolite" of this area may prove to be apoanalcite.

DISCUSSION: The composition and the birefringence are distinct from those of normal analcime, but further study, especially x-ray, is needed.

MICHAEL FLEISCHER

Mavinite

B. RAMA RAO, "Kyanophilite"—a new mineral of the hydrous aluminum silicate group, and "mavinite"—a new type of brittle mica, from Mavinhalli, Mysore. *Records Mysore Geol. Dept.*, **43**, 17-30 (1944) (Publ. 1946).

PHYSICAL PROPERTIES: Monoclinic, tabular or platy aggregates forming small books like micas. Often twinned. Cleavage basal, less perfect than in micas. Laminae slightly flexible, but inelastic and brittle. Sectile. $H=2-2\frac{1}{2}$, $G=2.90$. Color dark bottle-green in thick sheets, very pale green in thin laminae.

Optically biaxial positive, $2V$ about 30° , mean n $1.626 \pm .001$, birefringence very low, $\gamma - \alpha$ approx. 0.004. Pleochroism very faint, X almost colorless to very pale bluish-green, Z very pale yellowish-green.

CHEMICAL PROPERTIES: Analysis by E. R. Tirumalachar of material free from inclusions, dried at 105° , gave SiO_2 30.33; Al_2O_3 45.67; Fe_2O_3 1.58; FeO 2.96; MgO 7.24; CaO none; MnO none; alk. tr.; loss on ignition 12.52; sum 100.30%. Apparently a member of the chlorite group.

OCCURRENCE: Occurs near Mavinhalli, Mysore, India, as loose bits at the contact of enstatite peridotite with graphite-kyanite schists and sillimanite-biotite gneisses. Not found in place in fresh rocks. It is believed to be formed by contact metamorphism resulting from the intrusion of peridotite into pre-existing altered aluminous rocks.

NAME: For the locality.

M.F.

NEW DATA

Kyanophilite

B. RAMA RAO, "Kyanophilite"—a new mineral of the hydrous aluminum silicate group, and "mavinite"—a new type of brittle mica, from Mavinhalli, Mysore. *Records Mysore Geol. Dept.*, **43**, 17-30 (1944) (Publ. 1946).

An abstract of a preliminary report on this mineral has been printed in *Am. Mineral.*, **32**, 255 (1947). Additional data are now presented. Two analyses by E. R. Tirumalachar on material dried at 110° gave SiO_2 46.98, 46.60; Al_2O_3 38.09, 38.57; Fe_2O_3 1.13, 0.71; MgO 0.85, 0.75; CaO none, none; Na_2O 2.09, 1.54; K_2O 5.46, 7.81; loss on ignition 5.40, 5.00; sum 100.00, 100.98%. The analysis previously printed of a third sample differs from these in showing sodium predominant over potassium. Optically biaxial, negative (?). Indices of refraction $\alpha=1.577$, $\beta=1.580$, $\gamma=1.584$, all $\pm .002$. $G=2.89-2.90$, $H=4$ on fresh faces, $2\frac{1}{2}-3$ on exposed faces. No cleavage observed, fracture uneven and splintery.

DISCUSSION: Perhaps members of the ill-defined hydrous mica group. Evidently not a single mineral, since both sodium-bearing (rectorite?) and potassium-bearing (bravaisite, illite?) varieties are included.

M.F.

Dunhamite

The new mineral name dunhamite was proposed in a paper by E. E. Fairbanks published in *Econ. Geol.*, **41**, 761-768 (1946). I commented (*Am. Mineral.*, **32**, 372 (1947)), "It is not clear whether Fairbanks re-examined this material or depended on the literature entirely." Mr. Fairbanks has now informed me that the optical data and etch tests he recorded in his paper were his own observations, made on 50 polished sections. Furthermore, he made contact print tests that showed Pb and Te to be the principal constituents of the mineral, as had previously been conjectured, but not proved.

M. F.

DISCREDITED MINERALS

Minervite and Palmerite (= Taranakite)

F. A. BANNISTER AND G. E. HUTCHINSON, The identity of minervite and palmerite with taranakite. *Mineralog. Mag.*, **28**, 31-35 (1947).

X-ray, optical, and specific gravity determinations were made on taranakite (Hector and Skey, 1865) from the Sugarloaves, Taranaki, New Zealand, palmerite (Casoria, 1904) from Monte Alburno, Italy, and minervite (Carnot, 1895) from Minerva grotto, Hérault, France. These three hydrous potassium aluminum phosphates gave identical x-ray powder photographs, had *ns*, respectively, 1.502, 1.507, and 1.50; *G.*, respectively, 2.15, 2.15, not detd. The published analyses differ considerably; the composition is arbitrarily taken as $K_2O \cdot 3(Al, Fe)_2O_3 \cdot 3P_2O_5 \cdot 18H_2O$, from Casoria's analysis. The name taranakite has priority.

M.F.

Richmondite

C. OSBORNE HUTTON, Richmondite, a discredited mineral. *Nature*, **159**, 817 (1947).

Richmondite was described in 1877 by Skey as a lead, copper, iron, antimony sulfide, with minor silver and zinc, from Richmond Hill, New Zealand (See *Dana's System*, 7th edition, volume 1, page 393). Hutton has examined polished surfaces "from a number of specimens labelled 'Richmondite' that exhibit the properties described by Skey." He finds them to be mixtures containing, in order of abundance, argentian tetrahedrite, galena, sphalerite, chalcopyrite, pyrite, and perhaps stromeyerite.

DISCUSSION: Presumably the material examined was from the type locality, but this is not explicitly stated.

M.F.