composition gives a calculated specific gravity of 4.36 (measured value 4.24). High-temperature x-ray diffraction, D.T.A., and quench experiments indicate that on heating to about 80 °C the mineral breaks down to "tetragonal" cubanite and minor bornite. On slow cooling the original mineral is reformed.

Since this new mineral closely resembles the qualitative descriptions for chalcopyrrhotite in the literature, attempts to find it in specimens from the type chalcopyrrhotite locality were made, but none was found.

MONOCLINIC CHLORAPATITE FROM BOB'S LAKE, ONTARIO

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Chlorapatite was found as a skarn mineral with actinolite, diopside, and calcite at Bob's Lake, Frontenac county, Ontario. Chemical analysis (in per cent) is: CaO—53.4, P_2O_5—41.2, Cl_2—6.18, F_2—0.13, H_2O^+—0.09, H_2O^-—0.00, total = 101.00 − 1.45 ($0 = F_2 = Cl_2$) = 99.55% corresponding to the following formula:

$$Ca_{4.96}P_{3.03}O_{12.02}(Cl_{0.91}F_{0.04}OH_{0.03}).$$

Weissenberg and precession photographs indicate monoclinic instead of the usual hexagonal symmetry found in hydroxyl and fluoropatites, with $a = 2a_{hex} = 2 \times 9.638$ Å, $b = c_{hex} = 6.794$, $c = a_{hex} = 9.638$, space group $P2_1/a$.

Chlorapatite from Balme, Norway is hexagonal ($P6_3/m$) with a chlorine content of 0.84 atom per formula. This change, from hexagonal to monoclinic symmetry, is interpreted as a result of ordering of Cl ions with the monoclinic form being the ordered form, and ordered arrangement is favoured by high Cl-content.

LEUCOPHANITE, ELPIDITE, AND NARSARSUKITE FROM THE DESOURDY QUARRY, MONT ST. HILAIRE, QUEBEC

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Leucophanite occurs in simple short prismatic to tabular pseudo-tetragonal crystals in the silicate vugs in nepheline syenite. It is usually associated with analcime and serandite. Chemical analysis (in per cent) is: SiO_2—49.72, Al_2O_3—0.80, BeO—8.91, Na_2O—11.78, CaO—18.69, F_2—7.35, H_2O^+—0.84, corresponding to

$$(Na_{0.95}Ca_{0.85})Be_{0.89}Si_{2.07}Al_{0.02}O_6 \cdot (F_{0.97}OH_{0.12}).$$

The mineral is green and fluoresces pink in short wave ultraviolet. Optically it is biaxial negative with $\alpha_D = 1.565$, $\beta_D = 1.590$, $\gamma_D = 1.593$, $2V = 36°$, $D_m = 2.97 \pm 0.02$. The powder diffraction pattern is identical to that of the Norwegian material.

Elpidite was found as poorly formed prismatic crystals and fibrous aggregates in the altered silicate veins and vugs in nepheline syenite, frequently associated with microcline, catapleiite, aegirine, and calcite. Partial analysis (in per cent) gives: SiO_2—58.88, TiO_2—0.05, MnO—0.03, Na_2O—10.38, K_2O—0.1, ZrO_2—20.77, total Fe—0.01. It is orthorhombic with $a = 14.58$A, $b = 14.68$, $c = 7.14$, space group Pmmb. Optically it is biaxial negative with $\alpha_D = 1.562$, $\beta_D = 1.568$, $\gamma_D = 1.574$, $2V = 89°$. On hand specimens it is white to very pale tan in colour with a silky luster. Its powder diffraction pattern is identical to that of the Norwegian material but differs considerably from that of the material from Kola Peninsula, U.S.S.R.

Narsarsukite occurs as tabular tetragonal crystals with simple forms in the inclusions

in the nepheline syenite. It was usually found associated with quartz and sometimes with leucosphenite. Chemical analysis (in per cent) is: SiO_2—62.11, TiO_2—16.99, Al_2O_3—0.2, MnO—0.02, CaO—0.46, Na_2O—15.20, K_2O—0.1, P_2O_5—0.20, H_2O^+—0.17, F_2—0.76, total Fe—2.25, sum = 98.46. It is tetragonal with a = 10.721Å, c = 7.938, space group $I4/m$. The powder diffraction pattern of the St. Hilaire narsarsukite is identical to that of material from Greenland and Kola Peninsula, U.S.S.R.

THE OCCURRENCE OF KYANITE, ANDALUSITE, PYROPHYLLITE AND KAOLINITE IN LOWER PROTEROZOIC (HURONIAN) ROCKS OF ONTARIO

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Kyanite, andalusite, pyrophyllite and kaolinite are present in quartzites of the upper part of the Lorrain Formation in the Whitefish Falls region of the Sudbury District of Ontario. The quartzites were mylonitised during a regionally developed phase of secondary deformation. Kyanite grew during the later stages of the mylonitisation, whereas andalusite appears to be post-kinematic and is therefore considered to have grown at the same time as post-secondary-deformation biotite and garnet in nearby pelitic rocks. The replacement of kaolinite by both kyanite and andalusite is commonly observed in the quartzites, but there is no evidence to suggest that andalusite has replaced kyanite, both minerals appearing to co-exist in equilibrium.

The occurrence of kyanite-andalusite-kaolinite quartzites in the Huronian is yet one more point of similarity between the Lower Proterozoic rocks of Canada and Scandinavia tending to support correlation of the Penokean and Karelian orogenies occurring ca. 2,100 m.y. ago.

ELECTRON MICROSCOPY AND DIFFRACTION ON KAOLINITIC CLAYS

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Samples from a sedimentary kaolinitic clay deposit, located near Mexico City, contained fine kaolinite conglomerate, irregular hexagonal crystals, long and thin curved rods, thin irregular plates often with rolled edges, and small cylindrical crystals with hexagonal-like edges. Upon hydration, the latter disappeared, the thin irregular plates increased, and the long rods remain unaltered. Non-textural single-crystal electron diffraction patterns on the different phases, with intensity measurements and structural factor computations indicated disorders that could explain the morphology of the minerals.

PETROGRAPHY OF AN ALKALI-SILICA REACTIVE ROCK IN THE CANADIAN SHIELD

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Sand-gravel deposits along the Montreal River in the Canadian Shield are characterized by an abundance of greywackes and argillites. Routine acceptance tests of samples for concrete aggregates did not indicate the presence of harmful constituents. The quick chemical reactivity test performed on these samples and on crushed drill