Particularly detailed studies were made of teeth from the gymnarthrid microsaur (*Hylerpeton dawsoni*), and the material was found to be crystallochemically identical with francolite, a carbonate fluorapatite. It is believed that the original "mineral" portion of the teeth was dahllite, and that it became francolite during the long period since its original formation. Average fluorine content of the fossilized dentin was 3.1%.

## THE CHEMISTRY OF SOME NEW BRUNSWICK PYRITES

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A selection of pyrites from a range of sulphide occurrences in New Brunswick was analysed for major and minor elements. The presence of copper, lead and zinc was shown to be the result of included sulphide impurities, the pyrite being associated with these sulphides in the majority of occurrences. Arsenic was also present in all analyses even though arsenopyrite was absent from some of the samples. The chemistry of the minor elements was essentially the same as that of analysed pyrites from other parts of the world. The analyses of these New Brunswick pyrites were corrected on the assumption that all of the copper, lead, zinc and arsenic was present as chalcopyrite, galena, sphalerite and arsenopyrite. The Fe:S ratios of the pyrites, extending from 1:1.85–2.07, with the majority of them occurring between 1:1.98–2.01, included with the analyses in Table 3, were calculated after these corrections had been made.

The cell dimensions of the pyrites were obtained by measurement from *x*-ray diffraction traces standardised against silicon. The results were statistically processed by a computer program. The majority of the values fall within the range 5.4172–5.4178 Å. Two extreme values of 5.4158 ± 0.0001 Å and 5.4203 ± 0.0001 Å occur. The lowest value, obtained for a pyrite separated from a Pennsylvanian sandstone, is thought to be the result of lattice disorder. The largest value was obtained from the sample containing the high cobalt and nickel values.

## AN IRON-TITANIUM OXIDE MINERAL FROM HEARST, ONTARIO

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A black, submetallic, weakly magnetic mineral found as a minor accessory in a quartz-kaolinite sand-clay deposit north of Hearst, Ontario, yields an *x*-ray diffraction pattern virtually identical to that of a mineral variously named proarizonite (Bykov; *Doklady Akademii Nauk SSSR* **156**, 567–570 (1964)) and pseudorutile (Teufer & Temple; *Nature*, **211**, 179–181, July 9th, 1966). Chemical analysis of hand-picked fresh grains indicates an ideal composition $Fe_2O_3.3TiO_2.0.6H_2O$, in close agreement with Bykov's findings. The brilliant, subadamantine grains have specific gravity, as determined on a Berman balance, of 4.03 ± 0.02. In polished section, fresh grains of the mineral appear to be composed of one phase (up to 1500 × under oil immersion), though most of the grains show alteration on surfaces and cleavage or parting planes, apparently to rutile or leucoxene. The mineral is very faintly anisotropic. In transmitted light, the mineral is opaque, even on thin edges. Streak is olive-gray.

The bulk of the deposit is made up of quartz, with irregular zones of kaolinite. The quartz grains are sharp and angular to subangular, showing no evidence of abrasion, and even crystal faces are undamaged. Minor accessories such as muscovite, staurolite and tourmaline (in euhedral prisms) are also fresh and unabraded. In short, the deposit is almost certainly not detrital, and may be the result of alteration in situ of a pre-existing highly leucocratic igneous rock. The Fe-Ti-oxide mineral gives every indication of being not an alteration or weathering product, but rather the product of primary crystallization.