

coid, and there is a strong dispersion—red greater than violet. What drew especial attention to this hornblende in the first instance was the fact that it appeared to be nearly uniaxial. When a section, cut at right angles to the acute bisectrix, is examined between crossed nicols in convergent light, a black cross is seen somewhat thickened toward the intersection of the arms. This cross, on revolving the stage, divides into two hyperbolas, but these separate from one another but very little, and appear to separate less than they really do, on account of the fact that the low double refraction and deep color of these sections causes the hyperbolas to be ill-defined, while the whole field is very dark. The dispersion, however, makes itself evident in the varying colors on the sides of the hyperbolas. When, however, a gypsum plate giving a red of the first order is inserted above the objective the hyperbolas become a little better defined, although still not sufficiently definite to allow the axial angle to be accurately measured. The axial angle is found to be over 30° , possibly as much as 45° , which, however, is still very small for hornblende, being about one-half the usual value. Our thanks are due to Professor Rosenbusch for his assistance in working out these optical relations.

On examining a large series of thin sections of nepheline-syenites representing most of the important occurrences hitherto discovered, only two rocks were found which contain a hornblende at all similar to that above described. The first of these is the nepheline-syenite from the Corporation Quarry at Montreal, in which hornblende with the same small axial angle, low double refraction, intense color and pleochroism, large extinction angle and high specific gravity, occurs intergrown with the augite. The second is the hornblende described by Hackman under the name of arfvedsonite and which occurs intergrown with aegerine in the nepheline-syenite from Umptek in the Kola peninsula.* This mineral, however, differs from typical arfvedsonite in having an extinction of about 40° as well as in several other important respects. It possesses moreover a very small axial angle, although this fact is not noted by Hackman, while in true arfvedsonite the axial angle is very large. This Kola hornblende is much lighter in color than the hornblende from either of the above mentioned Canadian localities.

In order to determine the chemical composition of this somewhat remarkable variety of hornblende from the Dunganon rock, it was decided to separate a portion for analysis. A considerable quantity of the rock was accordingly reduced to

* "Petrographische Beschreibung des Nephelinsyenites vom Umptek," von Victor Hackman. Kuopio, 1894, p. 14.