thomsonite described from Valle del Ojo de la Parida, except β is near 1.516.

Here, however, the thomsonite occurs as irregular clusters of botryoidal forms imbedded in the altered tuff. The mineral is commonly pale pink and has a radial structure. Thus far, no other zeolite has been found in the tuff.

Origin of the Zeolites

Two theories may be suggested to explain the origin of the zeolites in the andesite in Valle del Ojo de la Parida. The first is that they were formed by the interaction between the dissolution products of the andesite and the meteoric waters percolating through the Santa Fe gravels. The second is that the zeolites resulted from the interaction of hot solutions from the lava with certain early formed silicate minerals in the andesite.

It is doubtful if evidence is at hand to prove either theory. The writer believes that mineralized magmatic waters are more effective than meteoric waters in altering silicates to zeolites.

Regarding the thomsonite in the Socorro Range, the writer believes the mineral was formed by the hydrothermal alteration of a tuff consisting essentially of siliceous volcanic material admixed with some quantity of an intermediate composition. The alteration of siliceous rocks to zeolites is undoubtedly a much less common phenomenon than the alteration of basic rocks to the same minerals.

THE POCKET MINERALOGICAL OR POLARIZING MAGNIFIER

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The author had the pleasure of demonstrating both to the members at the meeting of mineralogists of U.S.S.R., held in Moscow in May 1937, and to the members of the XVII Session of the International Geological Congress, a small instrument, shown in figure 1. This instrument, named "the pocket mineralogical or polarizing magnifier," permits convenient identification in the field of non-opaque minerals and rocks by petrographic-optical methods. The instrument consists of a disc, graduated on the circumference, holding the object glass and attached to a handle. On the two sides of the disc round polaroid plates are placed, which may be rotated simultaneously, with reading of the degrees of rotation on the circumference of the disc. Over the polaroid-polarizer, directly under the object glass, a round glass plate is placed, rotating simultaneously with the polarizer, with a cross cut on it.

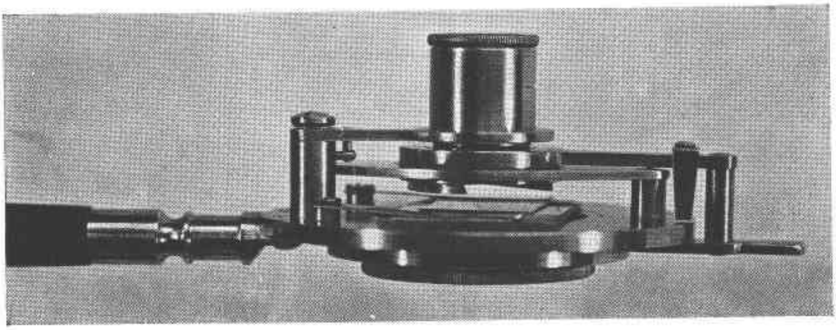

FIG. 1

Below the glass plate is a slit for inserting the compensators (gypsum plate, red 1st order, or graduated quartz wedge) and light filters.

Placed over the polaroid-analyzer there is the magnifier (×10 or ×16). Divisions on the quartz wedge may be seen through the lens simultaneously with the outlines of grains or of sections of minerals in slides of the rock, and the path difference of birefringent minerals may be determined by the compensation band.

In order to observe pleochroism, the polaroid-analyzer of the polaroid-polarizer may be removed from the ring in which they rotate. To compensate the slight coloration of the polaroid, a plate with a corresponding light filter may be inserted in the slit over the polarizer or in place of the polarizer or analyzer.

For observations of conoscopic interference figures, e.g., of a muscovite plate, the magnifier is swung to one side and the phenomenon is observed by placing the polaroid-polarizer or the polaroid-analyzer close to the eye.

In order to observe the interference figures in a section of a small grain of a mineral in a rock slide, preferably not covered by a glass, the microlens of the microconoscope is introduced over the mineral grain. The preparation of the microconoscope was described by N. Vedeneeva and A. Kolotushkin.[1] Accurate microballs of a small size, about 1 mm. in diameter are also readily obtained by another simple method described in the Lomonosov Institute of the Academy of Sciences. Instead of a microball, half immersed in a celluloid plate, use may be made also of a cover glass with a hemispherical lens (radius of curvature 0.5–0.6 mm.) cemented to it with Canada balsam. A thin glass plate with some air bubbles also can be used as a microconoscopic plate.

The disc with polaroids may be inserted in a slit of a block of wood or ruler (24 cm. long, 3–4 cm. high and 2–3 cm. wide). Since any diameter of the disc may be placed parallel to the length of the ruler, the combination of the disc with the polaroids and a ruler may replace to a certain extent the conoscope and the Fedorov stage with two axes of rotation. The angle of the optic axes in a mica plate may be determined by means of the instrument in the following way. The ruler with the disc (on the level of the eyes arranged by means of a photographic stand) is placed upon a sheet of paper, fastened with knobs on the plate trestle board. By moving the ruler with the attached disc on the sheet of paper, the observed point of emergence of each of the optical axes of a mica plate is aligned with some signal, e.g., a telegraph pole, or a straight trunk of a tree which is seen through the mica and polaroids, and corresponding lines are drawn on the paper with the aid of the ruler.

The picture of the optic axes may be fixed also at the cross of the frosted glass of the photographic apparatus.

The angle between both the lines that have been drawn on the sheet of paper will correspond to the angle of the optic axes of the mica.

To the same end the Wulff net may be used by rotating the ruler about the center of the net and reading the angles on the circumference of the net.

For the observations of the phenomena taking place in characteristic directions of small mineral grains (<3 mm. >0.3 mm.) in thin sections of rocks, and for measuring the angles between these directions, the disc with polaroids in combination with a telemagnifier or a telemicroscope, like those made, for instance, by Zeiss,[2] may be used.

The maintenance of extinction while rotating the ruler with the disc around the axis perpendicular to the ruler and parallel to one of the two directions of extinction in the section of the mineral, will be evidence that the latter is uniaxial.

A disc of greater radius with an attached mechanism for a parallel shifting of the object glass with a rock slide may be used in petrofabric investigations, for measuring the angles between the optic axis and the perpendicular to the slide of such minerals as quartz and calcite. In the case when the optic axis makes a small angle with the plane of the thin section a method is applied like that described in the paper "On glass hemispheres for the petrographical microscope."[3] The investigations in the Petrographic Laboratory of the Institute of Economic Mineralogy have shown that the determination of the refractive indices by the immersion method with a double diaphragm and oblique illumination, may be made with this instrument with the magnifier $\times 10$, with an accuracy within five units in the third decimal place.

By placing the pocket mineralogical or polarizing magnifier in front of the microscope lamp, or a classroom lantern, good pictures of rock microsections in beautiful interference colors may be obtained on a screen, using the magnifier of the instrument as an objective.

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PROCEEDINGS OF SOCIETIES

NEW YORK MINERALOGICAL CLUB

American Museum of Natural History, New York City, February 16, 1938

The meeting was called to order by first Vice-President Olaf Andersen at 8.15 P.M. with 135 members and guests present. Professor S. J. Shand of Columbia University addressed the Club upon "Mineral Deposits of South Africa." Dr. Shand began with a summary of the general geology of South Africa and the neighboring states and indicated in general the relation of the deposits to the various formations. He then spoke upon specific deposits and gave interesting details of occurrences and associations which are not generally known. The Rand quartzites were described as containing, among other minerals, zircon, chromite, platinum, and osmiridium; and most interesting, small green diamonds, as primary minerals. He spoke of pyrite, chloritoid, muscovite, and tourmaline among the secondary minerals and then gave the data on the gold occurrence with the evidence relating to the controversy as to its origin. One very interesting specimen showed a streak of rounded pellets of carbon with a concentration of minute but visible gold flakes in the immediate vicinity.

Platinum was next discussed including two types of occurrences in the Bushveld, both in the norite and in dunite pipes cutting the latter and carrying up to 8 oz. a ton in their richest portions. Chromite and tin were also discussed, and a very unusual occurrence of the latter described. This was in the northern part of the Complex, where surface exposures of granite showed rings of rock impregnated with small black tourmaline needles and masses up to 20 feet in diameter. Within these rings were rich aggregates of cassiterite and mica, running as high as 80% cassiterite. Two of these pipes, most of which are now mined out, extended as much as 700 feet in depth.

Lead, zinc, manganese, copper, iron, coal and oil deposits were referred to briefly, and a new occurrence of zunyite described. Diamonds and their history received only a brief mention since they are so well known, but the members were interested to hear that the grease tables are so effective in retaining all of the diamonds which flow over them that it is rare to find a crystal farther down than the first ten inches of the table.

The crocidolite asbestos deposits were described but their origin was not explained. The "Tiger's eye" semi-precious gem material develops naturally from the fibrous crocidolite through oxidation and leaching of the other elements, leaving the silica to form a pseudomorph of the asbestos fibers. Other types of asbestos and the South African occurrence of stichtite were briefly mentioned and a fine specimen of this attractive mineral displayed.

Pegmatites are abundant in South Africa and show many of the characteristics of the American pegmatites. In the eastern Transvaal, pegmatites cut granite and basic schists,