horizontal position between the light source and the camera lens. This method, however, does not allow one the desired freedom of motion and ability to arrange the section in the most desirable position and orientation for photographing. This type of setup is also likely to result in damage to the polarizing plates or section by falling, on account of having an awkward set of conditions with which to contend. To overcome these inconveniences the writer devised the illuminator for transmitted light as shown in plan and cross section in Fig. 2. In this arrangement, to be used with a vertical photomicrographic or other camera, the section and polaroid plates are held in position by gravity and their relative position can be readily changed as desired. The arrangement as shown provides good diffused light and when a photoflood bulb is used the exposure is comparatively short—depending upon the magnification and stop used—and is usually of the order of three to ten seconds when using supersensitive panchromatic films or plates. The relationship of the parts are self evident and need no explanation except the short vertical piece at the top. This is provided to shield the top of the glass plates from light which may be reflected into the lens by devious routes. Additional protection may be obtained by clipping a piece of black cardboard to this upright.

In addition to using the illuminator for photographing sections in plane or crossed polarized light it is well adapted for photographing all objects up to 5×7 inches in ordinary transmitted light. When used in this manner the unused areas may be masked with black paper to avoid all undesirable reflections. When using crossed polarized light the extraneous field of the crossed polarizing plates afford a natural dark background.

OPTICALLY POSITIVE CORDIERITE IN THE KISSEYENEW GNEISS AT SHERRIDON, MANITOBA

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In 1933 the writer collected a suite of specimens from the Kisseyenew gneiss at the Sheritt-Gordon mine at Sherridon, Manitoba. Good specimens were available at this time as there had been recent extensive development both on the surface and underground, which produced fresh outcrops along roadways, and the mine dumps contained freshly broken material.

The Kisseyenew gneiss, which is the prevailing surface formation at Sherridon, has been described in some detail by Bruce and Matheson.[1] The main minerals present, according to these authors, are quartz, felspar, biotite, garnet and amphibole. Among the less abundant minerals,

[1] Bruce, E. L., and Matheson, A. F., The Kisseyenew Gneiss of Northern Manitoba' etc.: *Trans. Roy. Soc. Can.*, vol. **24,** sec. 4, p. 119, 1930.

cordierite is not mentioned by these authors, or by Wright who has also given a more general description of the gneiss.[2] Variation in the associations of the above minerals give rise to a distinct banding of the gneiss and also to variations in the lithological types. A conspicuous feature in many of the beds is the prevalence of grains of garnet of various sizes which Bruce and Matheson consider to be largely of the almandine variety.

Fresh specimens of the gneiss from the mine dump contained aggregates of grains of a blue, dichroic mineral which the writer has determined as cordierite from its physical and optical properties. The optical sign, however, is positive which is the opposite from that assigned to most cordierite. In these specimens the most obvious mineral present is garnet in large grains averaging 10 to 20 mm. in diameter. Biotite in numerous small flakes is the second most abundant mineral distinguishable without the aid of magnification. The color and outline of the garnet grains are well defined but the crystal boundaries are somewhat indistinct and crystal faces are not well developed. The cordierite studied in the specimens occurs in grains or aggregates of macroscopic dimensions and is usually associated with patches of sulphides, chiefly pyrite and some galena, which occur as part of the interstitial filling between the large grains of garnet.

The determinations of optical sign were made by immersion methods on material large enough to isolate mechanically. Sufficient determinations were made from suitably orientated fragments to verify the positive character of the optical sign.

Optically positive cordierite has been described from a number of places. It has been found in garnet-bearing rocks in India,[3] and in gneisses from the island of Attu.[4] The writer has recorded it from the Northwest Territories in Canada,[5] and recently it has been described as occurring in garnet-bearing rocks in New Hampshire.[6]

Pehrman, from a study of the optical and chemical data on the cordierite from Attu, points out that the optic sign may be related in some way to the content of iron, and that the optically positive variety is usually one with a high iron content.

The writer has not examined the finer grained material of the Kisseyenew gneiss in an effort to determine the presence of cordierite. Although it has not been mentioned by those who have described these

[2] Wright, J. F., *Geol. Surv. Can., Summ. Rept.* **1928,** Pt. B., p. 78, and *Summ. Rept.* **1930,** Pt. C., p. 13.

[3] Iyer, L. A. N., *Mineral. Mag.*, vol. **22,** p. 121, 1929.

[4] Pehrman, G., Acta Academiae Aboensis (Finland), *Mathematica et Physica*, vol. **6,** 1931.

[5] *Am. Mineral.*, vol. **18,** p. 216, 1933.

[6] Conant, L. C., *Am. Mineral.*, vol. **20,** p. 310, 1935.

rocks it might easily have been overlooked in the study of thin sections, unless suspected, because of its similarity in general appearance to quartz. There is some suggestion that this cordierite may be related to the sulphide mineralization since the grains of megascopic size are associated with the sulphides.

In addition to cordierite-bearing specimens the writer also collected one piece of green microcline from the same locality. It may also be mentioned that tourmaline was found in the pegmatite dikes that cut the gneisses. Cordierite, green microcline, and tourmaline have not been mentioned in the previous descriptions of the rocks from this locality.

PROCEEDINGS OF SOCIETIES

MINERALOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND

MINERALOGICAL SOCIETY, MARCH 26TH, 1936. SIR THOMAS H. HOLLAND, PRESIDENT, IN THE CHAIR.

(1) *Two new meteoric stones from South Australia—Lake Labyrinth and Kappakoola.* By Dr. L. J. SPENCER.

These two meteorites have recently been recovered by Mr. R. Bedford of the Kyancutta Museum, South Australia. The first was seen to fall and was located by a half-cast aboriginal in 1924 at a spot (30°20′S., 134°45′E.) about 27 miles N.W. of Lake Labyrinth. Broken and weathered fragments with a total weight of 57 lb. were collected in 1934, and the original weight of the mass is estimated at 75 lb. It is a light grey chondritic stone with very little metallic nickel-iron and troilite. The second meteorite was found in 1929 on a sand-hill at about 33°20′S., 135°30′E. in the hundred of Kappakoola, county Le Hunte, Eyre Peninsula. It is a small, completely crusted stone weighing 392.5 grams and of unusual shape, having the form of a right triangular prism with flat base and domed top. It is a minutely brecciated olivine-chondrite with a medium amount of nickel-iron and some troilite. A list is given of thirteen South Australian meteorites, for some of which information is not yet available.

(2) *Some Malvernian hornblendes: their genetic relationships.* By Prof. A. BRAMMALL and Mr. J. G. C. LEECH.

Analyses of twelve hornblendes from "appinitic" types, together with optical, spectroscopic, and assay data, confirm field evidence that the rocks themselves are syntectics of (a) hornblendite-pyroxenite terms and/or (b) amphibolites, epidiorites, etc., with (c) granitic, plagioclasic and other magmatic fluids, (including emanations)—acting singly, successively, or in oscillation. In any one rock-type, the amphibole is polyvarietal: *e.g.*, in the Hollybush "gabbrodiorite" (yielding water-worn zircons, etc.), tremolite—actinolite—green hornblende—blue-green hornblende. The $(OH)=2$ of the standard *x*-ray amphibole constitution is not sustained: n varies between 1.2 and 2.9 independently of the other groups and of the Al—Si relationship.

(3) *The effects of heat on the optical orientation of plagioclase felspars.* By Dr. C. T. BARBER (Communicated by Prof. C. E. TILLEY).

In 1931, T. W. Barth described a change of 6° in the optical orientation of labradorite due to heat treatment at 1000°C. for 300 hours. The experiments now described were