content of strontium indicate that the present mineral belongs to the granitic pegmatite. Further, when the cerium and silicon (in ppm) are plotted on the diagram given by Cruft (1966, p. 393), the point falls in the field given for pegmatitic apatites.

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Helvine in the gondite of Kajlidongri, Madhya Pradesh, India

THE gondite wall-rock around the epigenetic veins of Kajlidongri, Jhabua District, Madhya Pradesh, India (22° 57′ N., 74° 28′ E.), contains dark brown well-developed dodecahedral grains filling fractures at the crest of antiforms, and ranging in diameter from 1 to 2·5 mm; occasionally they exhibit traces of poorly developed {111} cleavage. Chemical tests showed that they contain iron, manganese, zinc, and beryllium. Because of the very small size of the included quartz grains, it is extremely difficult to obtain a pure sample of the mineral for analysis; a partial chemical analysis of two samples estimated to contain about 10 % impurity by microscopic examination gave: MnO 29·56, 30·50, FeO 14·05, 14·67, ZnO 4·15, 4·49 %, with refractive index 1·74, 1·76±0·001 and cell-size a 8·16 and 8·18 Å. The only other sulphur-bearing mineral in and around the epigenetic veins in the area is baryte, forming fracture-filled veins in a gondite composed of porphyroclasts of quartz and recrystallized grains of spessartine and alurgite. The gondite in this area includes many textural types of different permeabilities, and the baryte is restricted to gondite wall-rocks of considerable porosity, while helvine is restricted to gondite with recrystallized quartz where the intergranular permeability is almost absent. Presumably a higher f_{O_2} is responsible

for the formation of baryte in the more porous rock, while a much lower f_{O_2} in the recrystallized type resulted in the formation of helvine.

The baryte–fluorite assemblage in the epigenetic veins of this area helps to group them in the upper part of the epithermal zone of hypogene mineralization (Hewett, 1965). The presence in the wall-rock of the veins of a zinc mineral that is totally absent from the unaltered gondite and the associated bedded deposits is interesting and is an indicator of the presence of base metal sulphides at depth.

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High-calcic pigeonite from pegmatitic segregations in a dolerite dyke from Huli, Mysore State, India

ELONGATED columnar crystals of high-calcic pigeonite (see below), 5 to 30 mm long form an important constituent of the pegmatitic segregations in a dolerite dyke at Huli. The outcrop is marked in a generalized geological map accompanying a detailed geological account of the area by the author (Sathe, *et al.* 1966). The dyke is exposed on a hill-side, $\frac{1}{2}$ km W. of Huli.

The pegmatitic segregations contain two pyroxenes, high-calcic pigeonite and augite, in the ratio of 30:70. Textural evidence points to early precipitation of augite and later growth of pigeonite. Thin-section study shows that the pigeonite is not exsolved from orthopyroxene but forms discrete small euhedral to subhedral grains and also elongate columnar crystals.

The pigeonite is pinkish-brown in colour and feebly pleochroic. Universal stage plots for 10 grains gave $2V_\gamma$: 0°, 26°, 30°, 24°, 28°, 30°, 31°, 19°, 24°, 26°. For γ:[001] the grains respectively gave: 30°, 38°, 39°, 38°, 36°, 38°, 39°, 33°, 38°, 38°. Birefringence varies from 0·002–0·004, and β from 1·678–1·689. The mineral does not exhibit any exsolved orthopyroxene laminae. It tends to occur side by side with augite which gives 2V from 49° to 59° and γ:[001] from 45° to 48°. In view of the unexsolved origin of the pigeonite and its coexistence with augite, the mineral was crushed, carefully