THE STRUCTURE AND PETROLOGY OF THE THIRD RING-DYKE COMPLEX, ARDNAMURCHAN

by

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PLATES

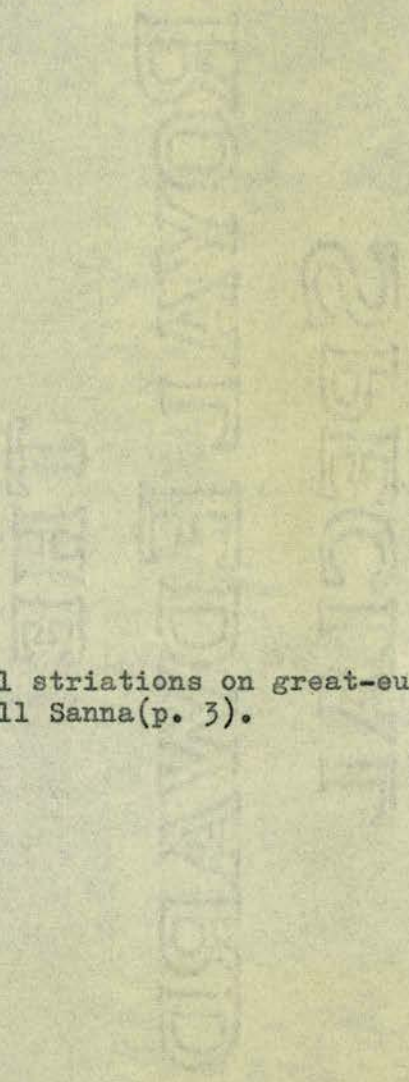
Thesis submitted to the University of Edinburgh for the degree of Doctor of Philosophy, 1957.

PLATE I

Panorama of the third ring-dyke complex from the south(p. 2).

PLATE I

PLATE II



Glacial striations on great-eucrite; summit of Meall Sanna(p. 3).

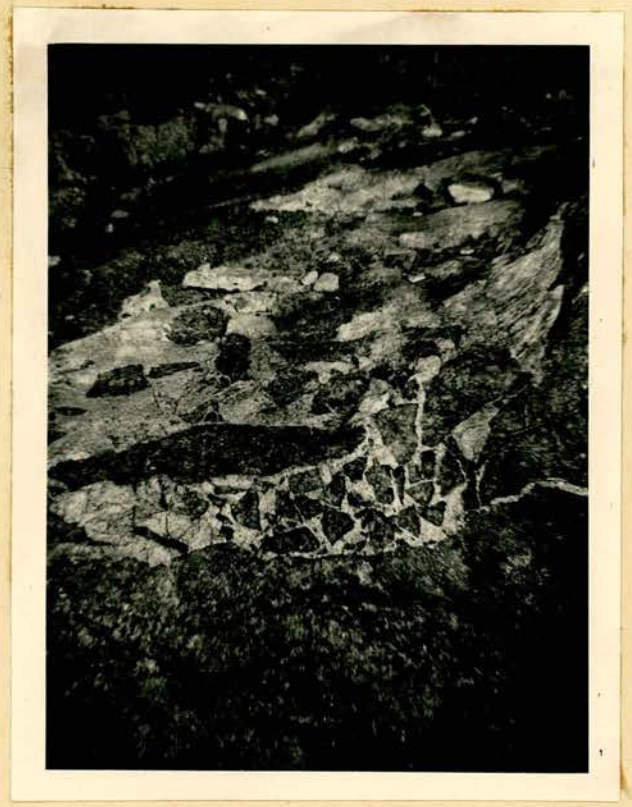
PLATE II

PLATE III

Net-veined gabbro; Meall an Fhir-eoin(p. 26,41).

Net-veined gabbro; Ben na h'Imielte(p. 26).

PLATE III



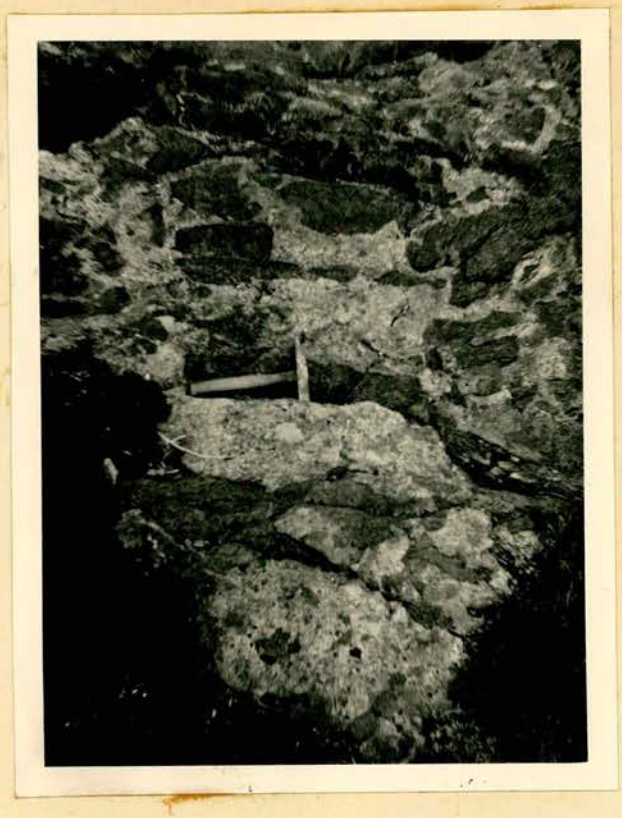


PLATE IV

Net-veined 'dolerite'; south-west side of Sithean Mor(p. 26,33).

PLATE IV

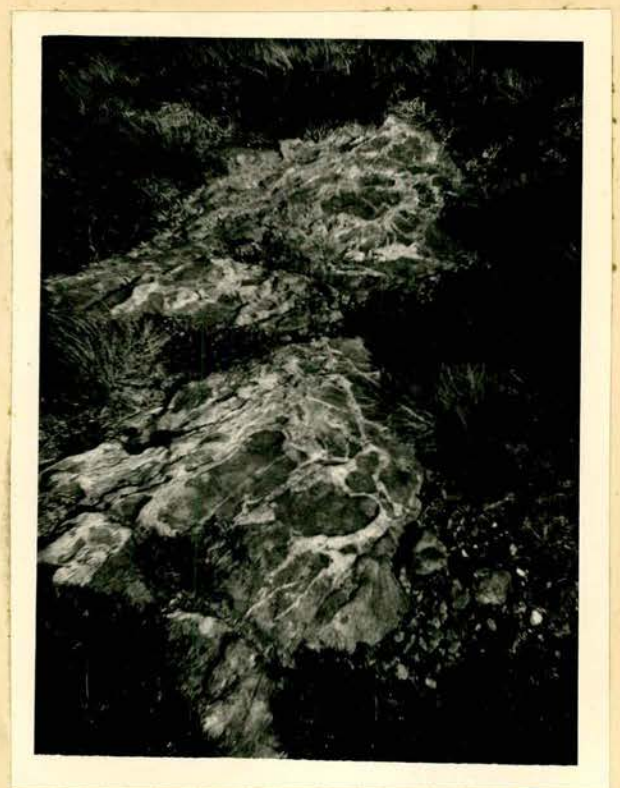


PLATE V

Acid net-veins in the gabbro wall-rock of the quartz-dolerite veined by granophyre; west side of Ben na h'Imielte(p. 27,31).

PLATE V

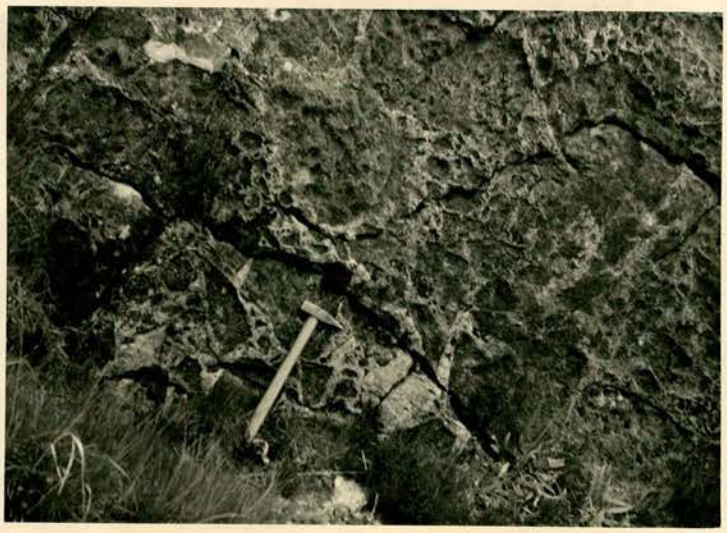


PLATE VI

Contact of quartz-dolerite veined by granophyre with overlying gabbro; east side of the complex (p. 39).

Zone of net-veined gabbro, three feet across; Meall an Fhir-eoin(p. 41).

PLATE VI

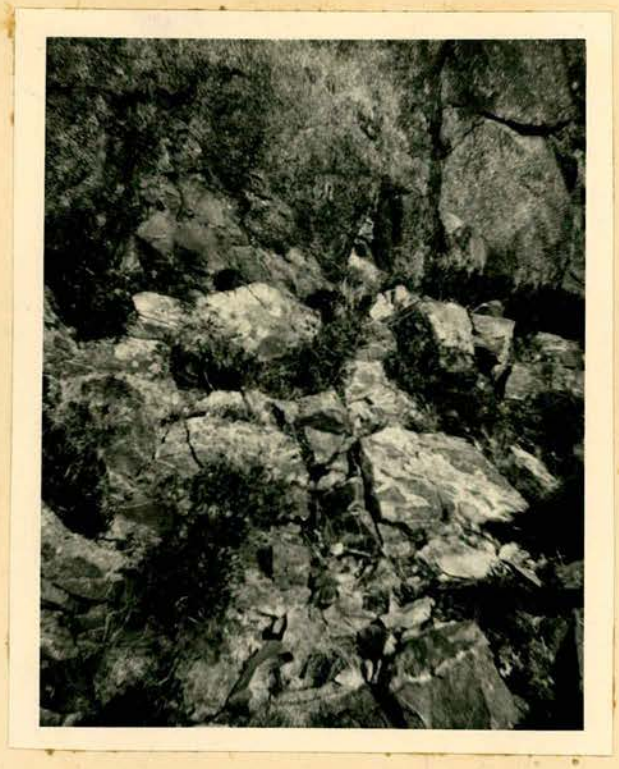
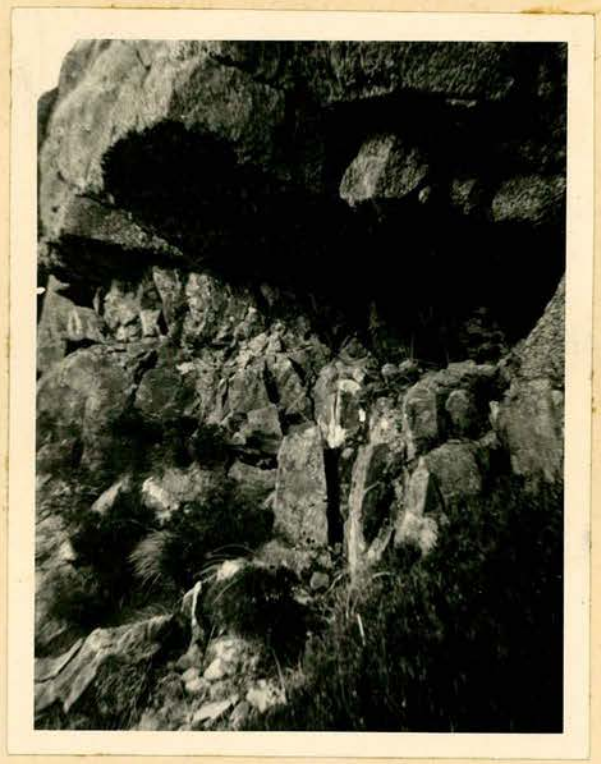


PLATE VII

Contact of sheet of net-veined basalt with overlying gabbro; Meall an Fhir-eoin(p. 42).

Altered gabbro wall-rock of quartz-dolerite veined by granophyre; crossed nicols x 14. (p. 49).

PLATE VII



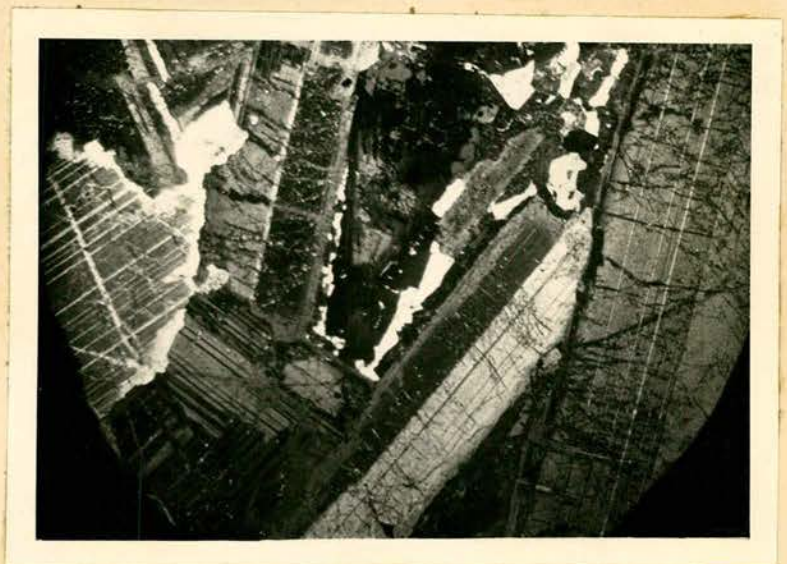


PLATE VIII

Gabbro plagioclase partially replaced by alkali feldspar in acid vein cutting the gabbro wall-rock of the quartz-dolerite veined by granophyre; crossed nicols x 25. (p. 50).

'Gabbro-tuff' vein cutting the gabbro wall-rock of the quartz-dolerite veined by granophyre; crossed nicols x 30. (p. 53).

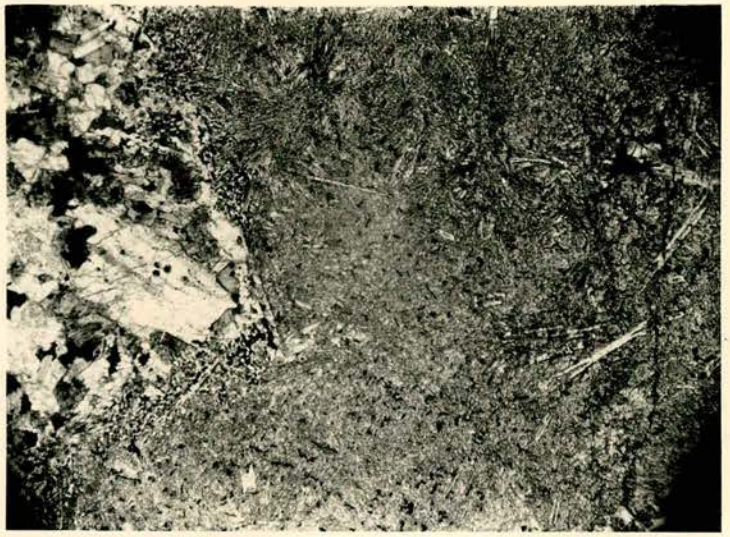
PLATE VIII

PLATE IX

Contact between olivine-basalt block and acid matrix. The innermost zone is on the extreme right; the inner limit of the zone of serpentinisation can be seen as a narrow black line close to the right side of the photograph. Note the concentration of iron-ore in the basalt at the contact; ordinary light x 25. (p. 59).

Replacement vein cutting block of variolitic basalt. Note the continuation of the variolitic structure across the vein; ordinary light x 25. (p. 62).

PLATE IX



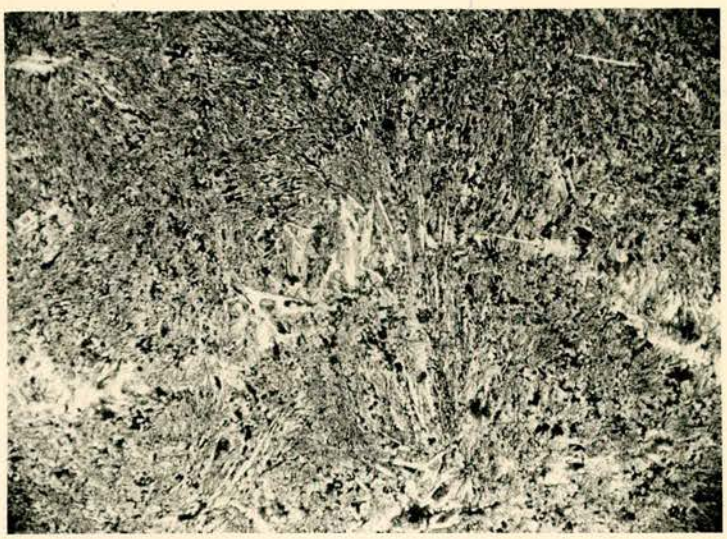


PLATE X

Typical texture of granulitic basalt block in quartz-dolerite veined by granophyre; ordinary light x 25. (p. 63).

PLATE X

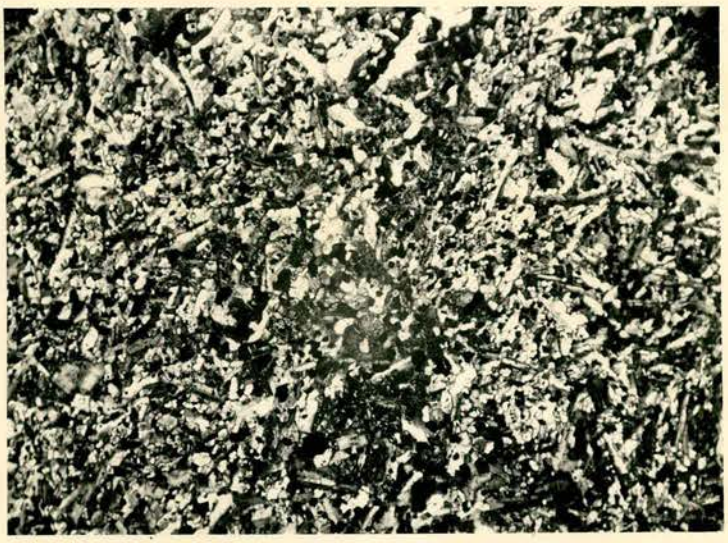
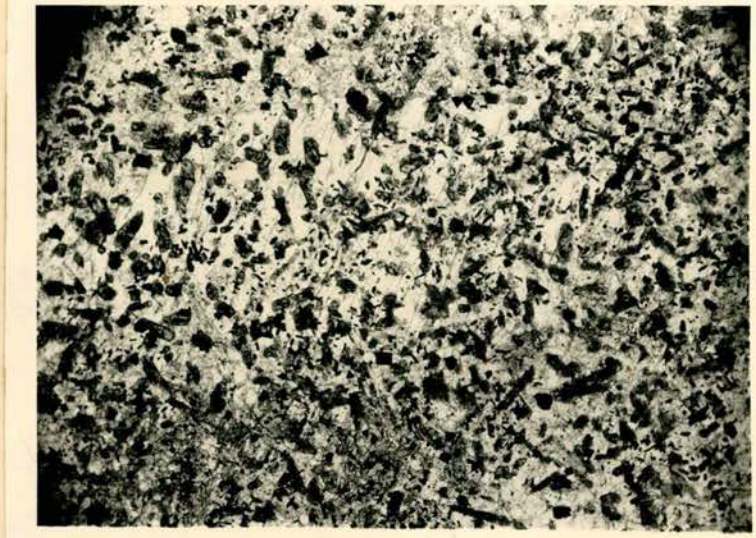


PLATE XI

Fine-grained acidified basalt block in quartz-dolerite veined by granophyre; ordinary light x 25. (p. 67).

The same field as above under crossed nicols showing a large poikiloblastic crystal of anorthoclase.

PLATE XI



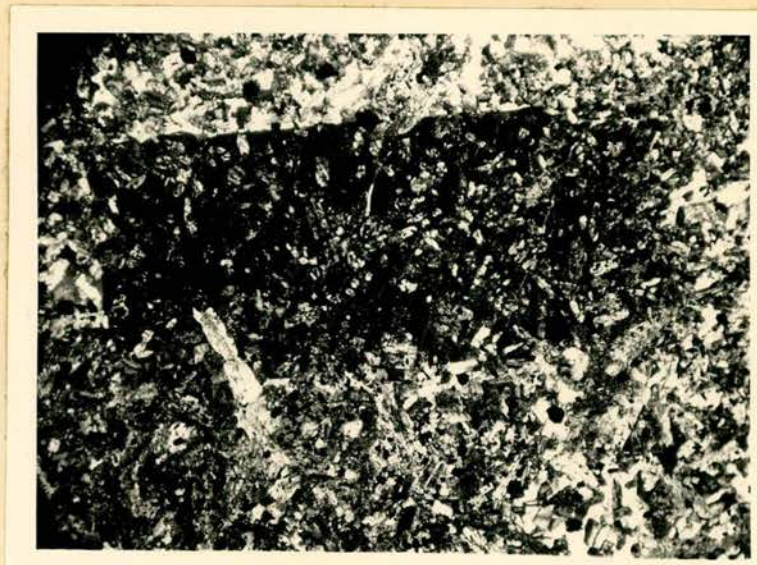


PLATE XII

Olivine-dolerite block in quartz-dolerite veined by granophyre; crossed nicols x 25. (p. 69).

Granulitised gabbro block in quartz-dolerite veined by granophyre; crossed nicols x 25. (p. 70).

PLATE XII

PLATE XIII

Gabbro plagioclase partially replaced by alkali feldspar in the uncontaminated acid matrix; crossed nicols x 25. (p. 74).

Gabbro plagioclase partially replaced by alkali feldspar in the intermediate matrix; crossed nicols x 25. (p. 76).

PLATE XIII

PLATE XIV

Plagioclase crystals partially replaced by alkali feldspar in the intermédiate matrix; crossed nicols x 25. (p. 76).

Contact between a block of variolitic basalt and the intermediate matrix. Note the continuation of the variolitic structure from the block across the contact into the matrix; crossed nicols x 25. (p. 78).

PLATE XIV

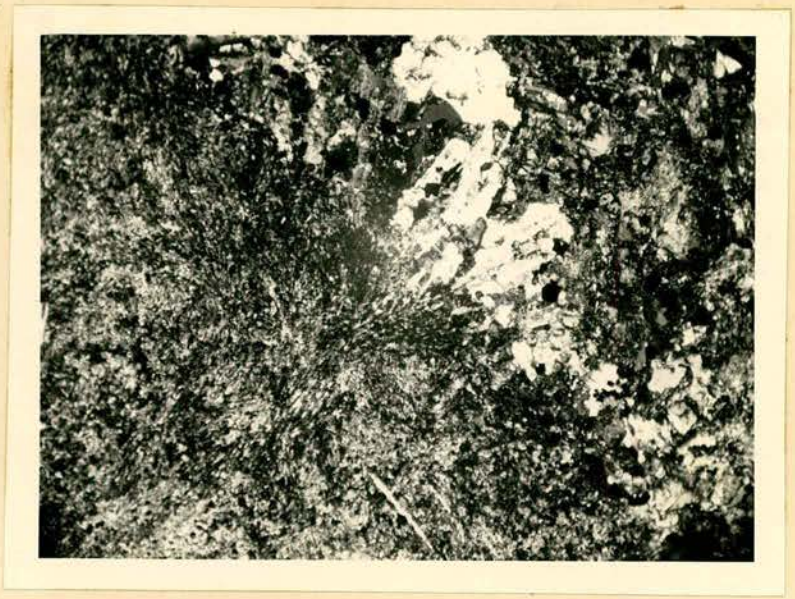


PLATE XV

Replacement of gabbro plagioclase crystals by albite and of gabbro pyroxene crystals by amphibole; zone of net-veined gabbro, Meall an Fhir-eoin. crossed nicols x 30. (p. 81).

PLATE XV

PLATE XVI

Contact between basalt block and matrix in a vein cutting gabbro; allt Coire nam Bothan. Ordinary light x 30. (p. 86).

The same field as above under crossed nicols. Note the large crystals of anorthoclase lying across the contact.

PLATE XVI

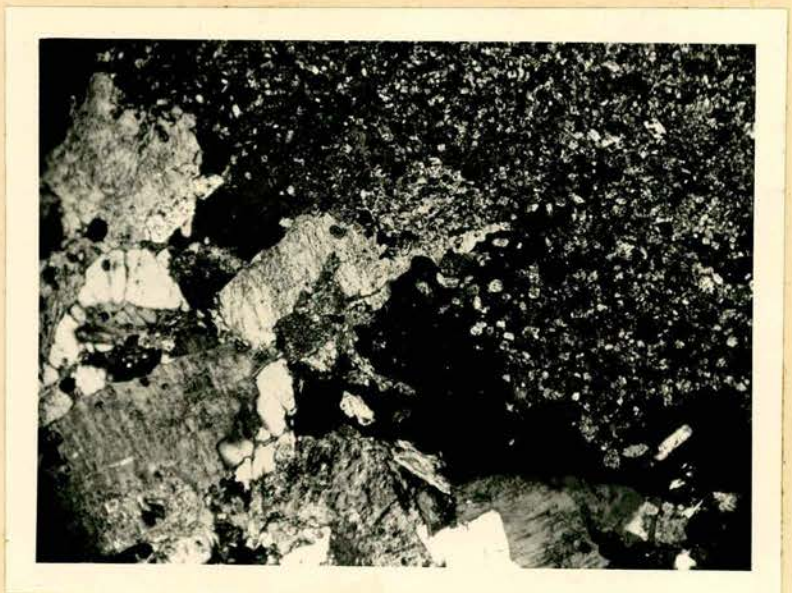


PLATE XVII

Net-work of granular quartz veins in a vein of recrystallised gabbro cutting the fluxion-gabbro wall-rock of the tonalite; crossed nicols x 30. (p. 128).

Altered crystal of gabbro plagioclase in a feldspathic vein cutting the fluxion-gabbro wall-rock of the tonalite; crossed nicols x 25. (p. 129).

PLATE XVII

PLATE XVIII

Fine-grained marginal tonalite; crossed nicols x 30. (p. 130).

Medium-grained marginal tonalite; crossed nicols x 30. (p. 130).

PLATE XVIII

PLATE XIX

Coarse-grained marginal tonalite; crossed nicols x 30. (p. 130).

PLATE XIX

Skeletal crystal of biotite in the interior tonalite; ordinary light x 14. (p. 138).

PLATE XX

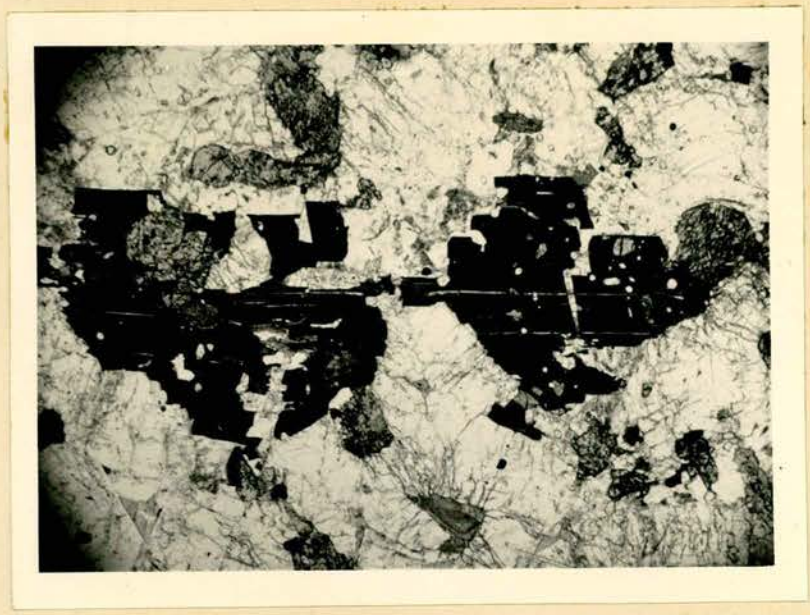


PLATE XXI

Pyroxene-granulite vein cutting the interior tonalite; ordinary light x 25. (p. 140).

The same field as above showing a large poikiloblastic crystal of anorthoclase.

PLATE XXI

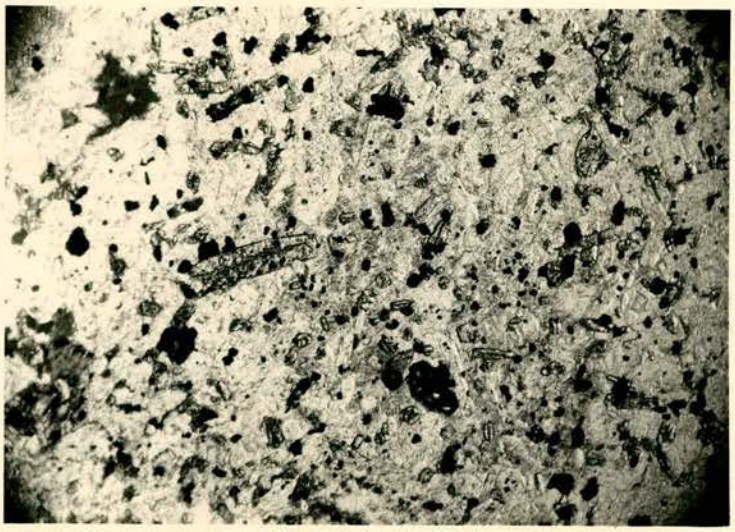


PLATE XXII

Contact between a granulitic patch and the acid matrix in the quartz-monzonite; ordinary light x 25. (p. 142).

The same field as above under crossed nicols.

PLATE XXII

Marginal replacement of plagioclase in gabbro inclusion within the tonalite; crossed nicols x 30. (p. 146).

Shatter-veins in a gabbro inclusion within the tonalite; crossed nicols x 30. (p. 147).

PLATE XXIII

PLATE XXIV

Granulitic inclusion within the tonalite; ordinary light x 25. (p. 148).

The same field as above under crossed nicols showing a large zoned plagioclase crystal and a large poikiloblastic crystal of anorthoclase; the anorthoclase partially encloses a skeletal crystal of biotite.

PLATE XXIV

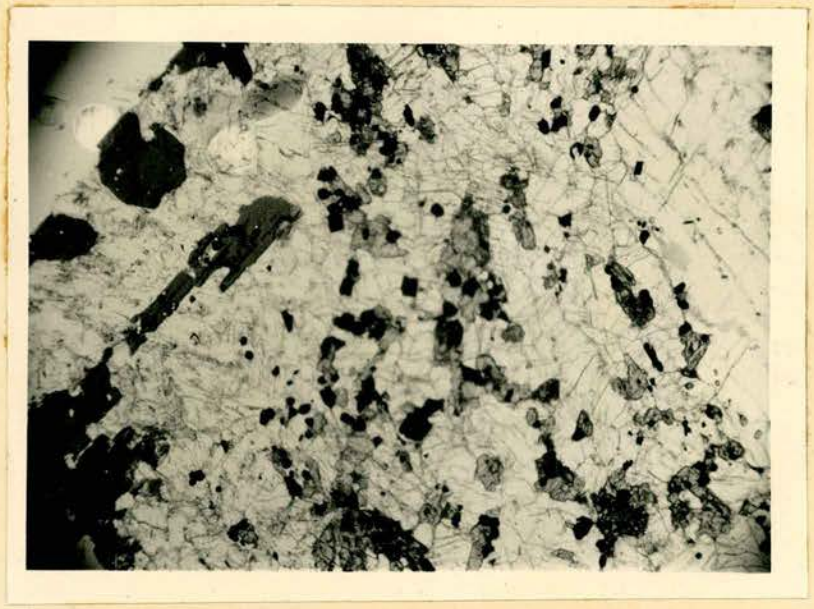


PLATE XXV

Marginal replacement of plagioclase by perthite in a vein of acid tonalite cutting a gabbro inclusion within the tonalite; crossed nicols x 30. (p. 150).

Replacement of plagioclase by perthite in acid tonalite close to a gabbro inclusion within the tonalite; crossed nicols x 25. (p. 150).

PLATE XXV

PLATE XXVI

Slab-jointing in the fluxion-gabbro of Glendrian; north of Glendrian farm, looking west (p. 194).

Displacement of quartzose veins by later diffuse acid veins in the fluxion-gabbro of Glendrian; west of Glendrian farm (p. 196).

PLATE XXVI

PLATE XXVII

Typical normal coarse-grained fluxion-gabbro of Glendrian; crossed nicols x 14. (p. 197).

Typical fluxion-quartz-gabbro; crossed nicols x 14. (p. 201).

PLATE XXVII

PLATE XXVIII

Typical quartz-gabbro, Glendrian; crossed nicols x 14. (p. 202).

Fine-grained olivine-granulite band in ophitic olivine-gabbro, Glendrian; crossed nicols x 30. (p. 205).

PLATE XXVIII

PLATE XXIX

Medium-grained olivine-granulite band in ophitic olivine-gabbro, Glendrian; crossed nicols x 30. (p. 207).

Coarse-grained olivine-gabbro, Glendrian; crossed nicols x 30. (p. 207).

PLATE XXIX

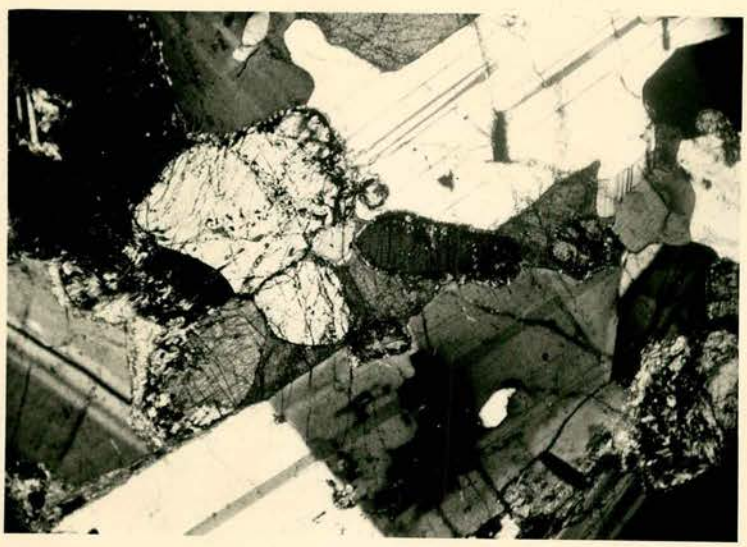


PLATE XXX

Large crystal of ophitic augite in olivine-granulite band, Glendrian; ordinary light x 14. (p. 207).

The same field as above under crossed nicols.

PLATE XXX

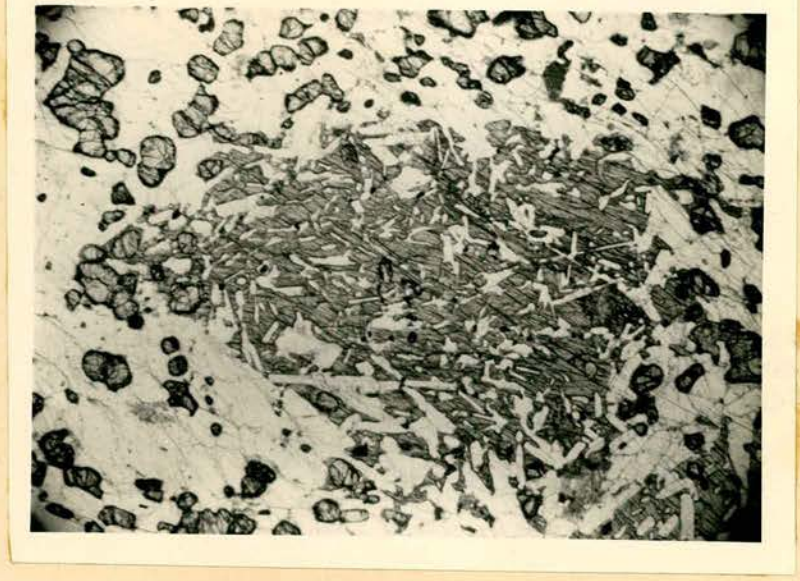


PLATE XXXI

Narrow vein of micro-breccia cutting the fluxion-gabbro of Glendrian; crossed nicols x 30. (p. 209).

Blocks of fine-grained fluxion-gabbro net-veined by coarse-grained fluxion-gabbro, Sithean Mor. (p. 233).

PLATE XXXI

PLATE XXXII

Typical normal coarse-grained fluxion-gabbro of Sithean Mor; crossed nicols x 14. (p. 238).

Typical fine-grained fluxion-gabbro of Sithean Mor; crossed nicols x 14. (p. 241).

PLATE XXXII

PLATE XXXIII

Large altered fragments of gabbro plagioclase and augite in a vein of gabbro-granulite; apophysis of Sithean Mor; crossed nicols x 14. (p. 247).

Part of a basalt block(left) and a large gabbro plagioclase crystal(right) in a matrix of recrystallised gabbro; apophysis of Sithean Mor; crossed nicols x 14. (p. 248).

PLATE XXXIII

PLATE XXXIV

Replacement vein cutting a basalt block; apophysis of Sithean Mor; crossed nicols x 30. (p. 248).

PLATE XXXIV

PLATE XXXV

Typical banding in eucrite; Meall Sanna(p. 271).

Regular interbanding of coarse-grained eucrite and granulitic eucrite; Meall Meadhoin(p. 272).

PLATE XXXV

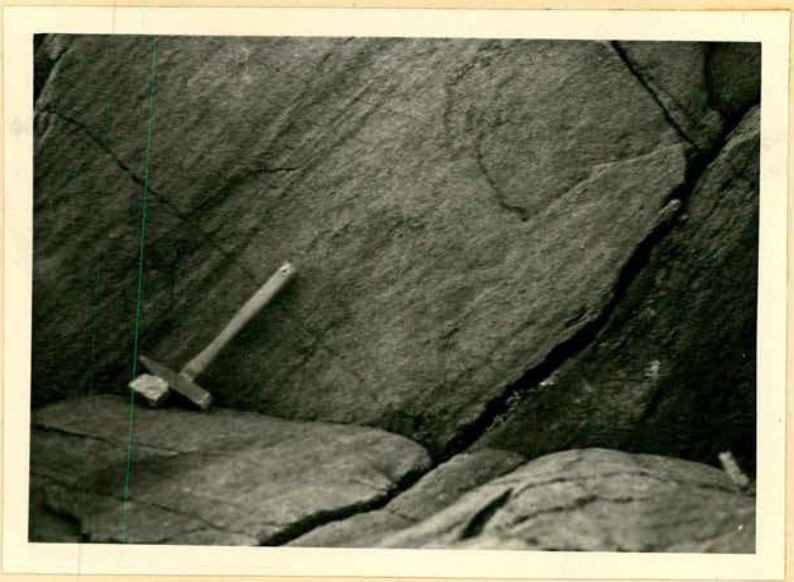


PLATE XXXVI

Vertical pyroxene-granulite 'dyke' interbanded with gabbro-pegmatite; Meall Sanna(p. 276).

Vertical 'dyke' of pyroxene-granulite, one foot across, cutting eucrite; Ben na h'Imielte(p. 277).

PLATE XXXVI

PLATE XXXVII

Narrow branching veins of pyroxene-granulite cutting the eucrite wall-rock of a broad 'dyke' of pyroxene-granulite; Ben na H'Imielte (p. 277).

PLATE XXXVII

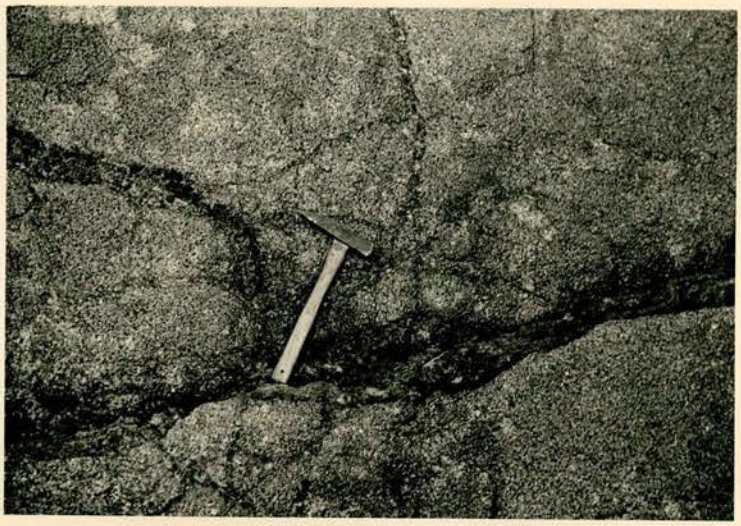


PLATE XXXVIII

Small plagioclase crystals enclosed within large plagioclase crystals in eucrite; crossed nicols x 14. (p. 280).

Typical texture of plagioclase in eucrite; crossed nicols x 14. (p. 280).

PLATE XXXVIII

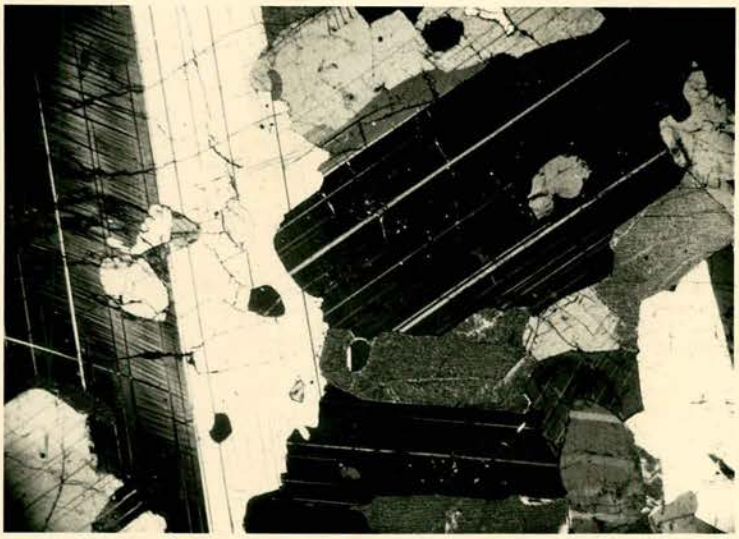


PLATE XXXIX

Inclusions of granular pyroxene and iron-ore within plagioclase. Note also the small enclosed plagioclase crystals and the interlocking nature of the plagioclase-plagioclase boundaries; eucrite. crossed nicols x 14. (p. 280).

Small rounded plagioclase crystals within augite of the eucrite; ordinary light x 25. (p. 281).

PLATE XXXIX

PLATE XL

Dendritic magnetite and hypersthene at the margin of altered olivine in eucrite; ordinary light x 14. (p. 281).

Typical olivine-rich granulite band in eucrite; Meall Meadhoin; crossed nicols x 14. (p. 284).

PLATE XL

PLATE XLI

Large composite plagioclase crystal enclosing olivine in a granulite band in eucrite; Meall Meadhoin; crossed nicols x 14. (p. 285).

Transitional rock between olivine-granulite and eucrite; Meall Meadhoin; crossed nicols x 14. (p. 286).

PLATE XLI

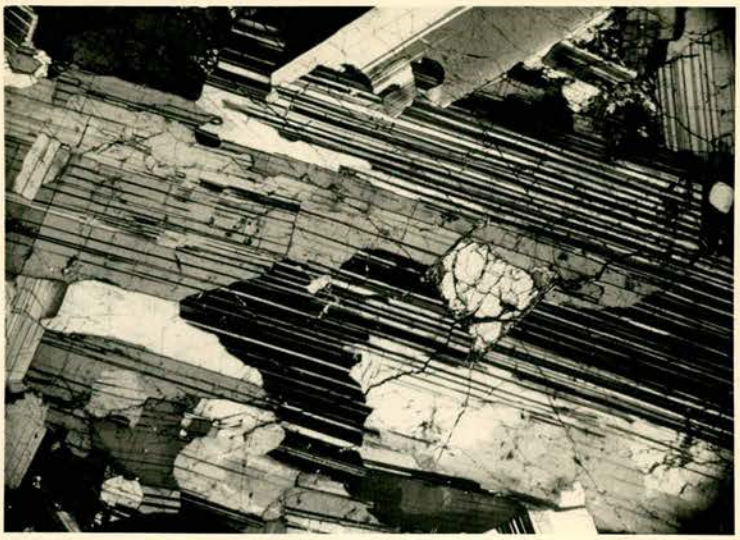
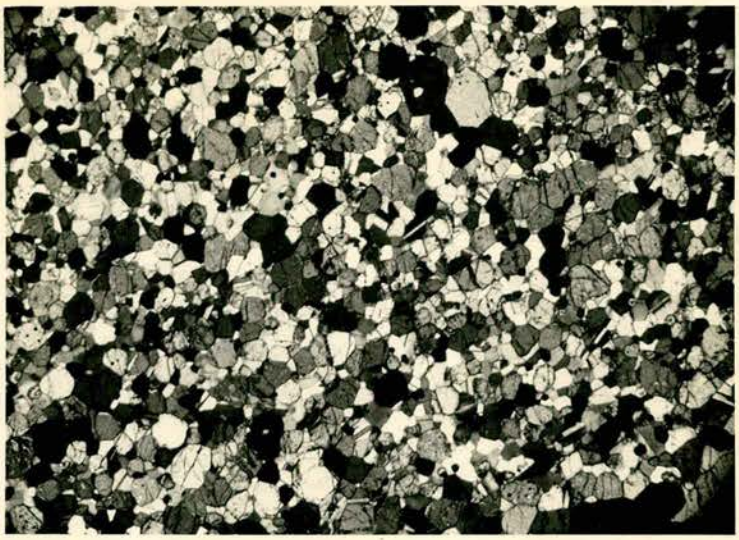


PLATE XLII

Fine-grained band of olivine-granulite in eucrite; Meall an Fhir-eoin; crossed nicols x 25. (p. 288).

Crystals of eucrite plagioclase and olivine in pyroxene-granulite 'dyke'; Ben na h' Imielte; crossed nicols x 14. (p. 292).

PLATE XLII



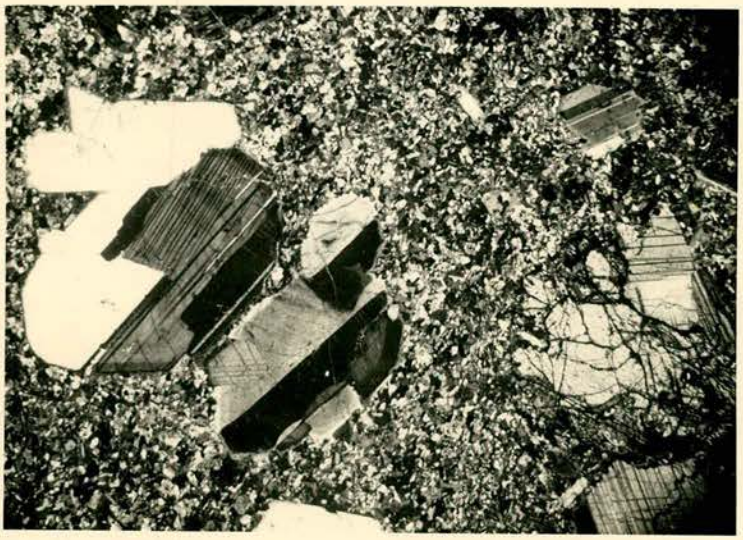


PLATE XLIII

Partially recrystallised eucrite plagioclase crystal in pyroxene-granulite 'dyke'; Ben na h'Imielte; crossed nicols x 14. (p. 292).

Completely recrystallised eucrite plagioclase crystal in pyroxene-granulite 'dyke'; Ben na h'Imielte; crossed nicols x 14. (p. 292).

PLATE XLIII

PLATE XLV

Recrystallised but unmoved eucrite wall-rock close to pyroxene-granulite 'dyke'; ordinary light x 14. (p. 294).

The same field as above under crossed nicols.

PLATE XLV

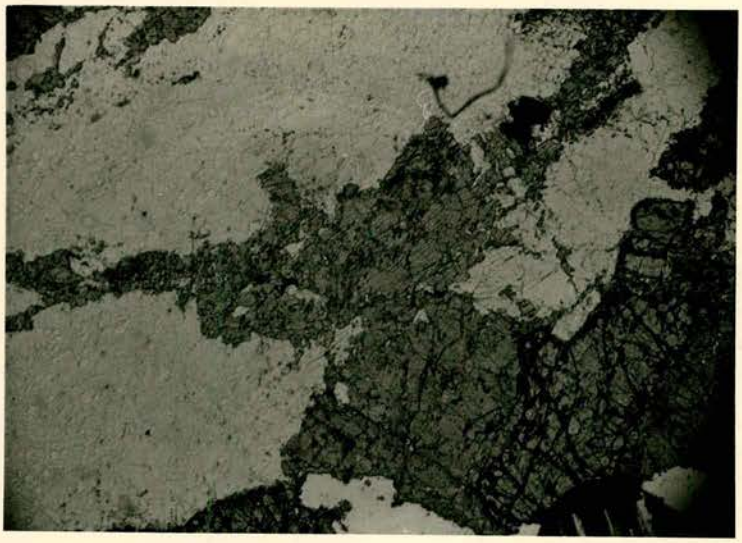


PLATE XLVI

Recrystallised and banded eucrite wall-rock at the contact with pyroxene-granulite 'dyke'; ordinary light x 14. (p. 294).

The same field as above under crossed nicols.

PLATE XLVI

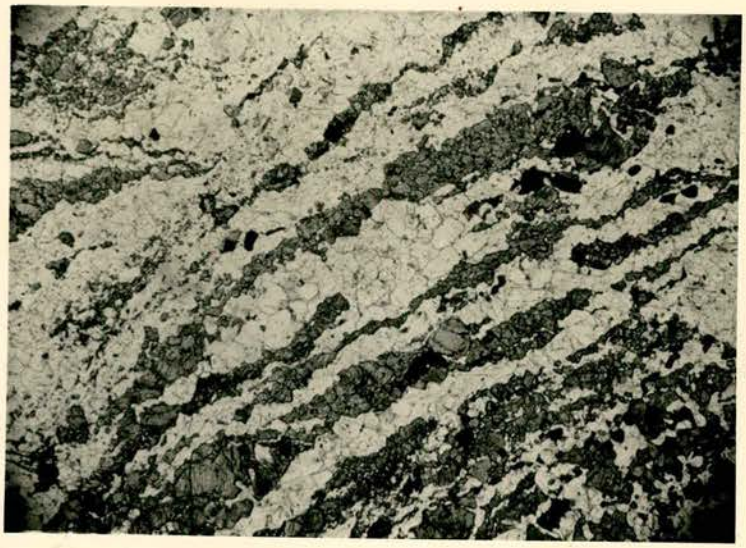


PLATE XLVII

Typical pyroxene-granulite; ordinary light x 30. (p. 294).

The same field as above under crossed nicols.

PLATE XLVII