

# Ultramafic-intermediate complex, Newry Igneous Complex, Late Palaeozoic intrusives, Northern Ireland

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Mitchell, W I (ed.). 2004. [The geology of Northern Ireland-our natural foundation](#). Geological Survey of Northern Ireland, Belfast.

## Introduction



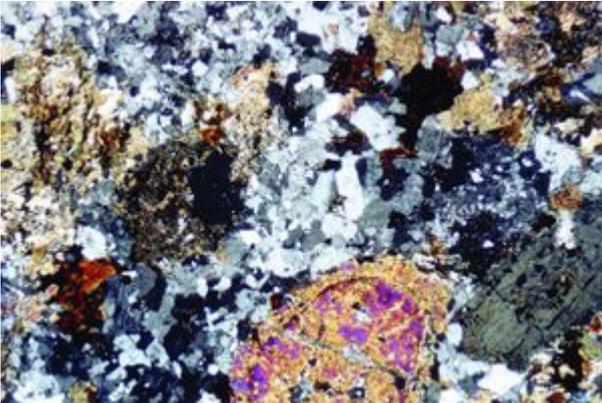
Alternating dark biotite pyroxenite (ultrabasic composition) and light, meladiorite (intermediate composition), of the ultramafic-intermediate complex (Newry Igneous Complex). Ardglass [J 320 422], southeast flank of Slievegarran, 7km NNW of Castlewellan, Co. Down. (Hammer head 16 cm long). (P947985)



Silurian country rock of the Gala Group contact metamorphosed to cordierite hornfels ('fused' or mobilised) by the intrusion of the Newry Igneous Complex. Slieve Croob [J 318 453], west and east of the summit, 10 km NNW of Castlewellan, Co. Down. (Hammer head 16 cm long). (P947986)



Photomicrograph No. 1 Photomicrograph No. 1 Biotite pyroxenite, composed mainly of biotite and augite with minor quartz, from the ultramaficintermediate complex at the northeast end of the Newry Igneous Complex [J325 423]. (Crossed polars, field of view 5 mm wide). (P948107)



Photomicrograph No. 2 Photomicrograph No. 2 Meladiorite from the ultramafic-intermediate complex [J325 423] composed of a finer grained matrix of plagioclase feldspar with phenocrysts of pyroxene (augite) and masses of biotite. (Crossed polars, field of view 5 mm wide). (P948108)

Ultramafic rocks consisting of biotite pyroxenite and augite biotite, and associated meladiorites are part of a layered intrusion that is confined to the northeast end of the Newry Igneous Complex in a close relationship with intermediate rocks. Petrologically they are composed of clinopyroxene, biotite and apatite as euhedral (cumulus) crystals (P948107) ± olivine with plagioclase the dominant cumulus phase in the meladiorites (P948108). The ultramafic rocks are mineralogically inhomogeneous, clinopyroxene-rich and biotite-rich varieties having sharp contacts. Massive biotite pyroxenite occurs in numerous exposures at Ardglass [J 320 422] on the southeast flank of Slievegarran and is also intercalated as lenses in the 'laminated' meladiorite. The meladiorites are commonly heterogeneous with variable content of either biotite or clinopyroxene. The ultramafic and intermediate rocks are typically coarse-grained and have intricate contact relationships (P947985).

Between the hills of Seeconnell [J 328 420] and Slievegarran [J 316 424] ultramafic rocks are closely associated with laminated meladiorites with a near vertical mineral layering of plagioclase crystals of calcic andesine to labradorite composition. In places the two rock types occur as centimetre-scale alternating layers. Between Slievegarran and Slievenisky [J 324 444] the two main lithologies are interlayered with 'unlaminated', more leucocratic, intermediate rocks of monzonitic-dioritic

composition.

Based on field evidence, the ultramafic rocks and associated meladiorites probably developed as crystal cumulates from an intermediate magma. There is no evidence that the ultramafic rocks were intruded into the associated intermediate rocks as a crystal mush, nor can they be construed as a marginal facies of an intermediate magma that developed against the Silurian country rocks. The mineralogical inhomogeneity and mineral layering in the meladiorites developed in the upper crust, in a convecting intermediate magma chamber that may have been connected to a Caledonian central volcano <sup>[1]</sup>.

Intermediate rocks consisting of augite-hypersthene monzonite, monzodiorite and more rarely augite-biotite diorite are concentrated at the margin of the northeast granodiorite pluton in the vicinity of Slievegarran, Slievenisky and Seeconnell. Petrographically they contain clinopyroxene, large poikilitic orthopyroxene, biotite crystals up to 3 cm long, minor amounts of quartz and plagioclase composed of sodic andesine. In the meladiorites, olivine can be abundant but quartz is usually absent. Rock types encountered along a 300 m section from the northeast base of Slievegarran to its summit include laminated meladiorites interlayered with ultramafics and fine-grained, unlaminated quartz monzodiorite and diorite. Both the intermediate and ultramafic rocks are intruded and veined by granodiorite of the northeast pluton.

At the margin of the Ultrabasic-Intermediate Complex, contact metamorphism has altered the Silurian country rock to a cordierite hornfels (P947986) in which 'fusing' and remobilisation of the sediments may have destroyed bedding. Textures in these country rocks are extremely variable ranging from a rock resembling fine-grained biotite granite to a biotite-rich hornfels in which bedding is still preserved. The occurrence of the hornfels at the northeast end of the complex and at the outer contact of the granodiorite on Slieve Croob was historically viewed as confirmation of a metasomatic origin for the Newry Igneous Complex.

[Newry Igneous Complex, Late Palaeozoic intrusives, Northern Ireland](#)

## References

- <sup>[1]</sup> Meighan, I G, and Neeson, J C. 1979. The Newry igneous complex, County Down. *In*: Harris, A L, Holland, C H, and Leake, B E (eds.). *The Caledonides of the British Isles-reviewed*. Special Publication of the Geological Society of London, 8, 717-22.

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