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Reassessment of selected ‘old survey’ graptolite collections from the Moffat district

Southern Uplands Mapping Programme

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BRITISH GEOLOGICAL SURVEY

INTERNAL REPORT IR/02/126

Reassessment of selected ‘old survey’ graptolite collections from the Moffat district

Mark Williams

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Summary

As a contribution to the mapping programme in the Southern Uplands of Scotland, this report re-examines graptolites from selected ‘old survey’ collections in the Moffat district. The localities, chosen by Dr R.P. Barnes, are summarised with a National Grid Reference and identification of the graptolite biozone (when possible) in the following list. The number sequence (left hand column of the list) refers to a spreadsheet of locality data held by Dr Barnes at Murchison House, Edinburgh (for further details email rpb@bgs.ac.uk). Details about the graptolite faunas are given within the main body of the report.

38	NT 0450 0950, Dead Burn , youngest horizon about <i>atavus</i> Biozone (or ? <i>cyphus</i>); older horizons include <i>acuminatus</i>
41	NT 1389 0591, Frigg Pipe-line , Silurian
42	NT 0395 0448, Frigg Pipe-line , youngest horizon within the range <i>halli</i> to lower <i>turriculatus</i> s.s. biozones
46	NT 1500 1710, Gameshope Burn , possibly lower Llandovery, and probably not younger than Aeronian
112	NT 1535 0940, Bodesbeck Burn , youngest horizon is <i>sedgwickii</i> Biozone s.l.; older horizons may be present
116	NT 1250 1340, Cold Grain , youngest horizon <i>sedgwickii</i> Biozone s.l.; older horizons are present (? <i>triangulatus</i>)
117	NT 1300 0420, Comal Burn , youngest horizon is <i>sedgwickii</i> Biozone s.s.; older horizons are present
118	NT 1410 0380, Comal Burn , Llandovery, not younger than Aeronian (?not younger than <i>magnus</i>)
120	NT 1475 0535, Crofthead Burn , youngest horizon is <i>convolutus</i> Biozone; older horizons are present
123	NT 0606 0248, Frigg Pipe-line , probably the <i>cyphus</i> Biozone
129	NT 1085 0647, Frenchland Burn , youngest horizon <i>leptotheca</i> or <i>convolutus</i> Biozone; horizons as old as <i>cyphus</i>
131	NT 1100 1600, Fruid Water , youngest horizon is <i>triangulatus</i> or <i>magnus</i> Biozone; older horizons include <i>acuminatus</i>
139	NT 1100 0530, Hunterheck Hill , grey-green sandstones with trace fossils, age indet.
147	NT 1365 0810, Shortwoodend , <i>triangulatus</i> or <i>magnus</i> Biozone present, possibly also <i>leptotheca</i> Biozone

Biostratigraphy

This section provides analysis of Silurian graptolites recorded at selected ‘old survey’ localities in the Moffat district of the Southern Uplands, and reviews their significance for age determination. In studying the graptolites, determination of the youngest age at each locality has been emphasised, and the faunal lists for older horizons may not represent the full complement of graptolites.

Many of the ‘old survey’ collections were made in the early 1870s, before Lapworth’s (1878) monumental work on the ‘Moffat Series’. The material, usually indicated by BGS registers to be from a single collection locality, in reality often comprises graptolites from more than one biozone, and was evidently collected from more than one horizon.

The locality numbers used in the following biostratigraphical analysis (see items 1 to 14) are based on a spreadsheet of locality data for BGS 1:50,000 sheets 16W (Moffat) and 16E (Ettrick), held by Dr R.P. Barnes at Murchison House. The graptolite biozonal scheme used here is that of Rickards (1976), with some modifications by Loydell (1992).

Item 1) locality 38 at NT 0450 0950, foot of **Dead Burn**, about 6 km NW of Moffat.

Specimen numbers: M4153-4159, collected by Macconochie in 1872

Fauna includes: *Normalograptus miserabilis* (Elles and Wood, 1906), *Normalograptus normalis* (Lapworth, 1877), *Coronograptus?* (fragment), *Atavograptus atavus* (Jones, 1909)?, *Atavograptus gracilis* (Hutt, 1975)?, *Metaclimacograptus* spp. (small *slalom*-like form and larger *hughesi*-like form), *Parakidograptus acuminatus* (Nicholson, 1867).

Age: the youngest horizon may be about the *atavus* Biozone, or possibly the younger *cyphus* Biozone if the *Coronograptus* is correctly identified; older horizons are present, particularly the *acuminatus* Biozone (see Rushton, 1995a).

Item 2) locality 41 at NT 1389 0591, **Frigg Pipe-line trench**, 610 m at N 34° W of Rivox

Specimen numbers: 2E451-454

Fauna comprises: monograptid and other graptolite fragments.

Age: Silurian.

Item 3) locality 42 at NT 0395 0448, **Frigg Pipe-line trench**, near Holmshaw - **this is an interbedded horizon**

Specimen number: 2E421

Fauna comprises: *Stimulograptus* cf. *halli* (Barrande, 1850)

Age: *S. halli*, if correctly identified, indicates a range within the *halli* to lower *turriculatus* s.s. biozones (see Loydell, 1993).

Item 4) locality 46 at NT 1500 1710, **Gameshope Burn**, eastern branch

Specimen numbers: M2212^d-M2214^d

Fauna comprises: graptolite fragments some of which resemble *Atavograptus* and narrow *Pristiograptus*.

Age: possibly lower Llandovery, and probably not younger than the Aeronian Stage

Remarks. Rushton (1995b) came to a similar conclusion about the age at this locality. He also recorded *Normalograptus medius* (Törnquist) from the western branch of Gameshope Burn, suggesting the lower Llandovery there.

Item 5) locality 112 at NT 1535 0940, **Bodesbeck Burn**, Moffat Water, about 8 km NE of Moffat

Specimen numbers: M4441-4448, collected by Macconochie in 1872

Fauna includes: *Stimulograptus sedgwickii/halli* and ?*Campograptus lobiferus* (M'Coy, 1850) (on the same rock slab), and diplograptids which suggest an older horizon

Age: the youngest horizon present is assignable to the *sedgwickii* Biozone s.l.; older horizons may be present

Item 6) locality 116 at NT 1250 1340, **Cold Grain**, head of Blackhope Burn, about 9 km NE of Moffat

Specimen numbers: M4183-4197, collected by Macconochie in 1872

Fauna includes: *Stimulograptus sedgwickii* (Portlock, 1843), *Stimulograptus sedgwickii/halli*, *Pristiograptus* sp., ?*Campograptus lobiferus* (with *S. sedgwickii*), triangulate monograptids, *Coronograptus gregarius* (Lapworth, 1876), *Rhaphidograptus toernquisti* (Elles and Wood, 1906), *Normalograptus* spp., *Orthograptus* sp.

Age: the youngest horizon present is assignable to the *sedgwickii* Biozone s.l.; older horizons are present, possibly as old as the *triangulatus* Biozone, though the register only indicates a single collection

Item 7) locality 117 at NT 1300 0420, **Comal Burn**, at bend about halfway up, about 5 km E of Moffat

Specimen numbers: M4287-4295, collected by Macconochie in 1872

Fauna includes: *Stimulograptus sedgwickii*, *Stimulograptus sedgwickii/halli*, *Petalolithus* sp., *Rhaphidograptus toernquisti*, *Torquigraptus* aff. *involutus* (Lapworth, 1876), *Lagarograptus acinaces* (Törnquist, 1899)?, *Rastrites longispinus* Perner, 1897?, *Pristiograptus*? sp., '*Orthograptus*' *bellulus* (Törnquist, 1890)

Age: the youngest horizon can be assigned to the *sedgwickii* Biozone s.s.; older horizons are also present though the register only indicates a single collection

Item 8) locality 118 at NT 1410 0380, **Comal Burn**, pathway at head, about 7 km E of Moffat

Specimen numbers: M4366-4370 (some missing) , collected by Macconochie in 1872

Fauna includes: *Rhaphidograptus toernquisti*, *Normalograptus medius* (Törnquist, 1897)?, *Orthograptus* sp.

Age: Llandovery, not younger than Aeronian: if *N. medius* is correctly identified the horizon is probably not younger than the *magnus* Biozone

Item 9) locality 120 at NT 1475 0535, head of **Crofthead Burn**, about 6 km E of Moffat

Specimen numbers: M4296-4300 (some missing), collected by Macconochie in 1872

Fauna includes: *Campograptus lobiferus*, *Torquigraptus decipiens* (Törnquist, 1899)?, *Rhaphidograptus toernquisti*, *Cystograptus vesiculosus* (Nicholson, 1868)?, other graptolites

Age: the youngest horizon is the *convolutus* Biozone; older horizons are also present, though the register only indicates a single collection

Item 10) locality 123 at NT 0606 0248, **Frigg Pipe-line**, Elvanfoot to Canonbie section, 700 m E 25° S of Galet Hill

Specimen numbers: EU6877-6944

Fauna includes: *Dimorphograptus confertus* (Nicholson, 1868), *Coronograptus* ex gr. *gregarius* sensu Hutt, 1975, *Cystograptus vesiculosus*, *Pristiograptus fragilis* (Rickards, 1970) s.l. or *Lagarograptus acinaces* (fragment), *Atavograptus atavus*?

Age: probably the *cyphus* Biozone

Item 11) locality 129 at NT 1085 0647, **Frenchland Burn**, opposite Auldthorn Hill, about 3 km NNE of Moffat

Specimen numbers: M4252-4279, collected by Macconochie in 1872

Fauna includes: *Campograptus lobiferus*, *Petalolithus* sp., *Normalograptus rectangularis* (M'Coy, 1850), *Coronograptus gregarius*?, *Rhaphidograptus toernquisti*, *Cystograptus vesiculosus*, *Rhaphidograptus extenuatus* (Elles and Wood, 1908)?

Age: the youngest horizon is referable to the *leptotheca* or *convolutus* Biozone (coll. M4252-M4258); horizons as old as the *cyphus* Biozone are also present (coll. M4259-M4279)

Item 12) locality 131 at NT 1100 1600, **Fruid Water**, about 3 km above Fruid, Tweedsmuir

Specimen numbers: M1439^d-1495^d

Fauna includes: *Rhaphidograptus toernquisti*, *Dimorphograptus* cf. *longissimus* sensu Elles and Wood, triangulate monograptid (probably *Monograptus triangulatus* [Harkness] s.l.), *Metaclimacograptus* sp., *Climacograptus trifilis* Manck, 1923, *Parakidograptus acuminatus*, *Cystograptus vesiculosus*, *Rastrites longispinus*, *Normalograptus* sp.

Age: the youngest horizon is referable to the *triangulatus* or *magnus* Biozone; older horizons here include the '*vesiculosus*' Biozone and the mid part of the *acuminatus* Biozone

Item 13) locality 139 at NT 1100 0530, **Hunterheck Hill**, about 3 km NE of Moffat

Specimen numbers: M4461-4467

Fauna comprises: trace fossils in sandstones

Age: indeterminate

Item 14) locality 147 at NT 1365 0810, streamlet above **Shortwoodend**, Moffat Water, about 5 km NE of Moffat

Specimen numbers: M4280-4286 (some missing), collected by Macconochie in 1872

Fauna comprises: '*Orthograptus bellulus*?', *Normalograptus normalis*? and *Campograptus lobiferus*? (on same slab), triangulate monograptid, *Pristiograptus*?

Age: the presence of a triangulate *Monograptus* indicates the *triangulatus* or *magnus* Biozone at this locality, but the possible *Orthograptus bellulus*, and one fragment that resembles *Campograptus lobiferus* (on the same slab), might indicate a younger *leptotheca* horizon is also present: this is also suggested by the register entry for specimen M4285 (missing), which records [*Pribylograptus*] '*leptotheca*' itself.

Selected references

Most of the references listed below are held in the Library of the British Geological Survey at Keyworth, Nottingham. Copies of the references may be purchased from the Library subject to the current copyright legislation.

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