Excursion 22 Lesmahagow

Key details

Author	W.D. Ian Rolfe
Theme	Silurian arthropod and fish assemblages
Features	Jawless fish, eurypterids (water-scorpions), pod shrimps.
Maps	O.S. 1:63 360 Sheet 68 Biggar, Moffat and Sanquhar 1:50 000 Sheet 71 Lanark & Upper Nithsdale B.G.S. 1:63 360 Sheet 23 Hamilton
Terrain	Exposures in banks of shallow burns and slabs extending below water level; rough walking; wellington boots recommended.
Short Itinerary	The two parts of this excursion may be covered separately, : and the Shank Castle to Dunside visit abbreviated at will.
Distance and Time	Both areas are remote from public roads, and both involve a round trip walk of one mile from the nearest vehicle-access point. A whole day is needed for both parts of the excursion–a half day at each.
Access	Collecting is listed as a Potentially Damaging Operation (P.D.O.) by the Nature Conservancy Council at all the localities listed in this excursion. See first page of Hagshaw Hills excursion (Ex.21) for details of how to obtain the necessary permit and for local contacts that must be made. Cars should be left at Logan House (with permission–[NS 739 353]), at the turn off to Dunside Reservoir [NS 752 371].

Introduction

The Lesmahagow area is justly famed for its fossil arthropod and fish assemblages–some of the oldest complete fish in the world come from this area (at the *Jamoytius* horizon). Since it is difficult to trace a continuous section through the Lesmahagow succession in any one excursion, it is best to treat visits to the area as collecting expeditions, and two of the most important localities are described below. However, intending visitors will need to persuade the NCC of their good reasons for wishing to collect these rare and valuable fossils i.e. for research, teaching or museum purposes. Although these localities are 220 m (700 ft) apart, stratigraphically the rocks at both are thought to be of Upper Llandovery to Lower Wenlock age, and to be of marine origin. Of equal significance are the Slot Burn and Dippal Burn fish beds at higher horizons in the area (e.g. the Site of Special Scientific Interest at Slot Burn–[NS 680 321]), but these have been largely worked out by collectors or are otherwise difficult to collect from. The same fauna can be more conveniently collected from the fish bed in the Hagshaw Hills (Locality 12 of excursion 21).

Once permission has been obtained, to avoid disappointment the authorised collector should plan to spend a minimum of several hours at either of these localities, and should take adequate equipment for the task. 'No one need dream of going fossil collecting on the banks of the Logan Water in the same manner as would be done amongst the Carboniferous rocks. It requires hard work...' as the following partial list of tools used by J.R.S. Hunter in 1872 suggests: '32 steel chisels/2 miner's picks, 3 steel wedges, 9 hammers, 3 shovels, 3 crowbars, flask of gunpowder...sometimes we had to mourn the loss of fine specimens blown away or broken into splinters'. The most important collections have been made by enthusiasts who have camped on the site, from J.R.S. Hunter who erected his tent 'Siluria' at Shank Castle in 1882, through the Geological Society of Glasgow's 'Camp Siluria' from 1899 to the early 1900's up to A. Ritchie in the early 1960's, and the latest camp in 1973. Many unusual fossils have been described from these localities, but new forms can still be found. Anyone collecting material suspected of being new or rare, is advised to take it to one of the major

museums so that it may be recorded, and preferably deposited there for safe keeping.

There has been a recent history of illegal collecting from this area. Particular attention must therefore be paid before collecting to follow the directions given above under Access.

a. *Jamoytius* horizon (SSSI) (Figure 22.1) and (Figure 22.2)

This horizon is exposed 640 m (700 yds) SSW of Loganhouse along both banks of the Logan Water [NS 737 346]. Three exposures occur within 73 m (80 yds)–the central one being a 9 m (30 ft) cliff face capped by thick greywackes on the north side of the Logan Water. This cliff has been worked back by many collectors, including those of Camp Siluria, and it is now hazardous to remove additional material due to falling rock. More accessible exposures of the same mudstones and laminated siltstones are obtainable just upstream from this cliff, on the opposite south bank of the stream. Best results are obtained by clearing a bedding plane and peeling off large flags, which should be split as thin as possible. Contrast between fossil and matrix may be improved by immersing the flags in water.

The jawless fossil fish *Jamoytius kerwoodi* (named after the ichthyologist J.A. Moy-Thomas) is rare in these beds, and is usually seen as little more than a carbon stain on the rock: problematic material is best kept for determination in the laboratory. *Jamoytius* is the earliest anaspid fish, and its thin external skeleton (of v-shaped scales), gillbasket and terminal mouth supported by cartilage, suggest that it was an ancestral lamprey (Ritchie 1968a, 1984). The only fish commonly found is *Logania* [*Thelodus*] *scotica*. It occurs as a black sheet of minute articulated denticles which originally covered the body surface (there is no internal skeleton). Calcareous concretions (usually under 5 cm across) should be tapped open, since they commonly contain fossils. Frequently a soot-like powder is all that can be seen, but under magnification this can be seen to be a (? coprolitic) mass of disarticulated denticles of *Logania scotica*. The only other known occurrence of this fish is in Siberia, indicating E–W migration at this time, but no N–S communication with the Anglo-Welsh province. An unusual fossil in this horizon is the free swimming ?sea-squirt *Ainiktozoon loganense* (Ritchie 1985). The pod-shrimp Ceratiocaris papilio (Figure 22.1) is relatively plentiful (Rolfe 1962c; Rolfe and Beckett 1984), and large fragments of the net-marked, supposed pod-shrimp *Dictyocaris* occur. Such fragments are commonly pierced by circular holes up to 5 mm across, which coincide in size with the suctorial mouth of *Jamoytius*. *Jamoytius* may therefore have parasitized *Dictyocaris* by rasping holes in its exoskeleton, much as the living lamprey parasitizes other fish.

The eurypterids (water-scorpions) (Figure 22.2) *Slimonia acuminate*, *Erettopterus* [*Pterygotus*] *bilobus* and *Hughmilleria* are rare, as is the water-flea *Beyrichia*. *Cyamocephalus loganensis* is the oldest synziphosure (early king crab) known (Rolfe and Beckett 1984), but only one specimen has so far been found. The ?aquatic scorpion *Allopalaeophonus caledonicus*, one of the two earliest scorpions (Kjellesvig-Waering 1986), is also known from only one specimen found, supposedly at this locality in 1883. The oldest millipede known—*Archidesmus loganensis*—has also been described from these beds, but Ritchie suggests the unique specimen may only be a plant fragment (Almond 1985). Molluscs such as *Pteronitella*?, *Euomphalopterus* (*Platyschisma*) and orthoconic nautiloids may also be found, and, very rarely, the ?plant *Taitia catena*.

b. Shank Castle to Dunside

Between Shank (or Shank's) Castle [NS 746 362] and Dunside [NS 751 371] occur greyish mudstones and laminated siltstones of the Kip Burn Formation (the Pterygotus Beds of Peach and Horne), dipping 20° NW. The basal beds of this Formation (Peach and Horne's *Ceratiocaris* Beds) are exposed at Shank Castle below the reservoir, where they yield the pod-shrimp *Ceratiocaris*, *Dictyocaris*, *Beyrichia*, the eurypterids *Erettopterus* [*Pterygotus*] and *Slimonia* and very rarely the fish *Logania* [*Thelodus*] and *Birkenia*. The snail *Euomphalopterus*, the conoidal fossil *Hyolithes* [= Theca] *forbesii* and *Lingula minima* also occur.

Approaching Dunside, higher beds are exposed as slabs forming the banks of the Logan Water. It was from these slabs that Robert Slimon made his large collection of eurypterids (now mostly in Glasgow City Museum) and specimens in many other museums throughout the world have been obtained from here. Slimon exhibited his specimens at the Old College in Glasgow during the British Association meeting of 1855, where their importance was proclaimed by Sir

Roderick Murchison. The slabs yield the following rich fauna of eurypterids, the commonest being the large *Slimonia acuminata* and *Erettopterus* [*Pterygotus*] *bilobus* (? = P. lanarkensis); rarer forms are *Hughmilleria lanceolata*, Stylonurella spinipes (see Waterston 1979), *Carcinosoma scorpioides* and *Paracarcinosoma obesa* (illustrated by Rolfe 1989). Another early king crab (synziphosure), *Neolimulus falcatus*, is also known from these beds, but it too is represented by only one specimen.

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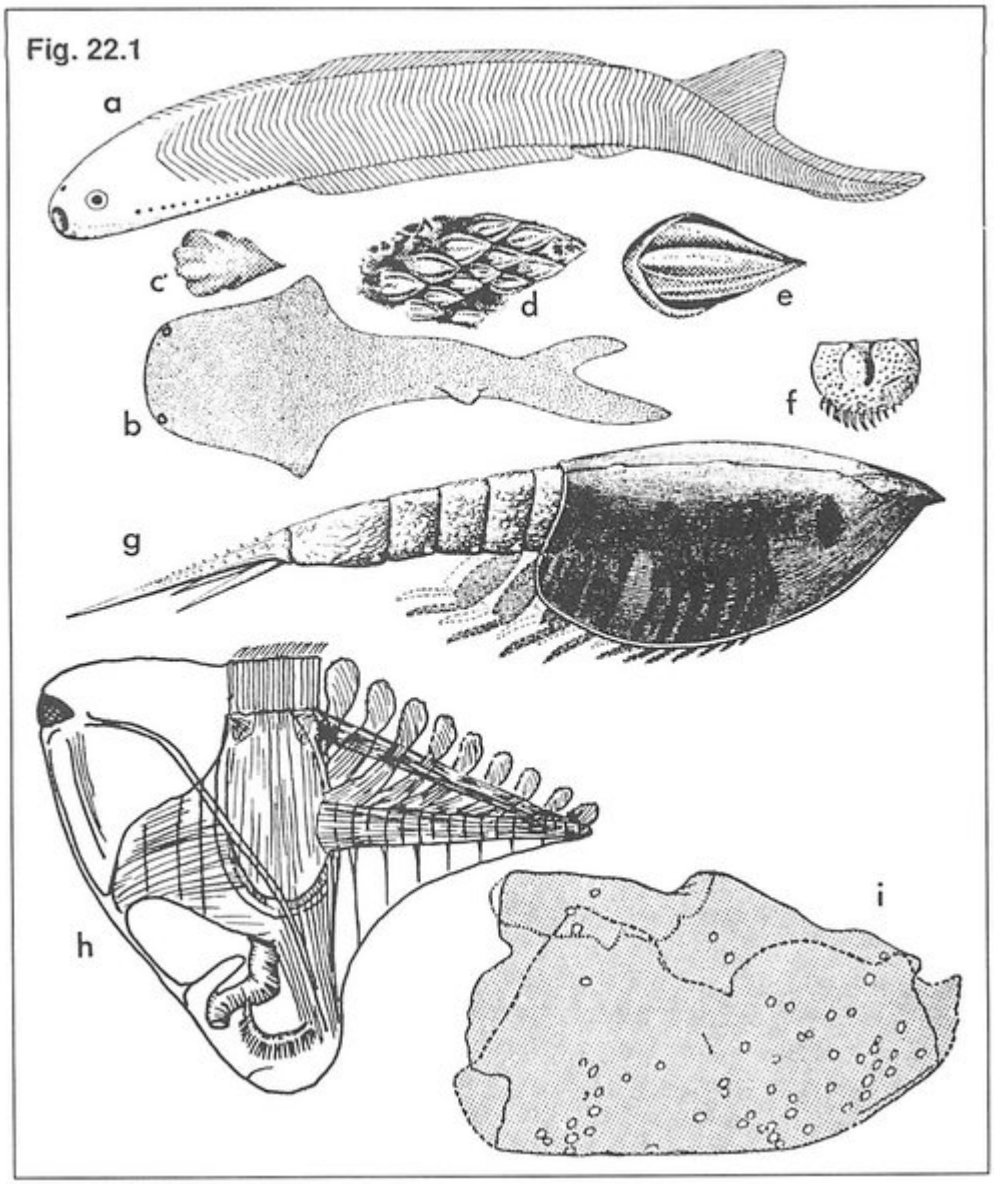
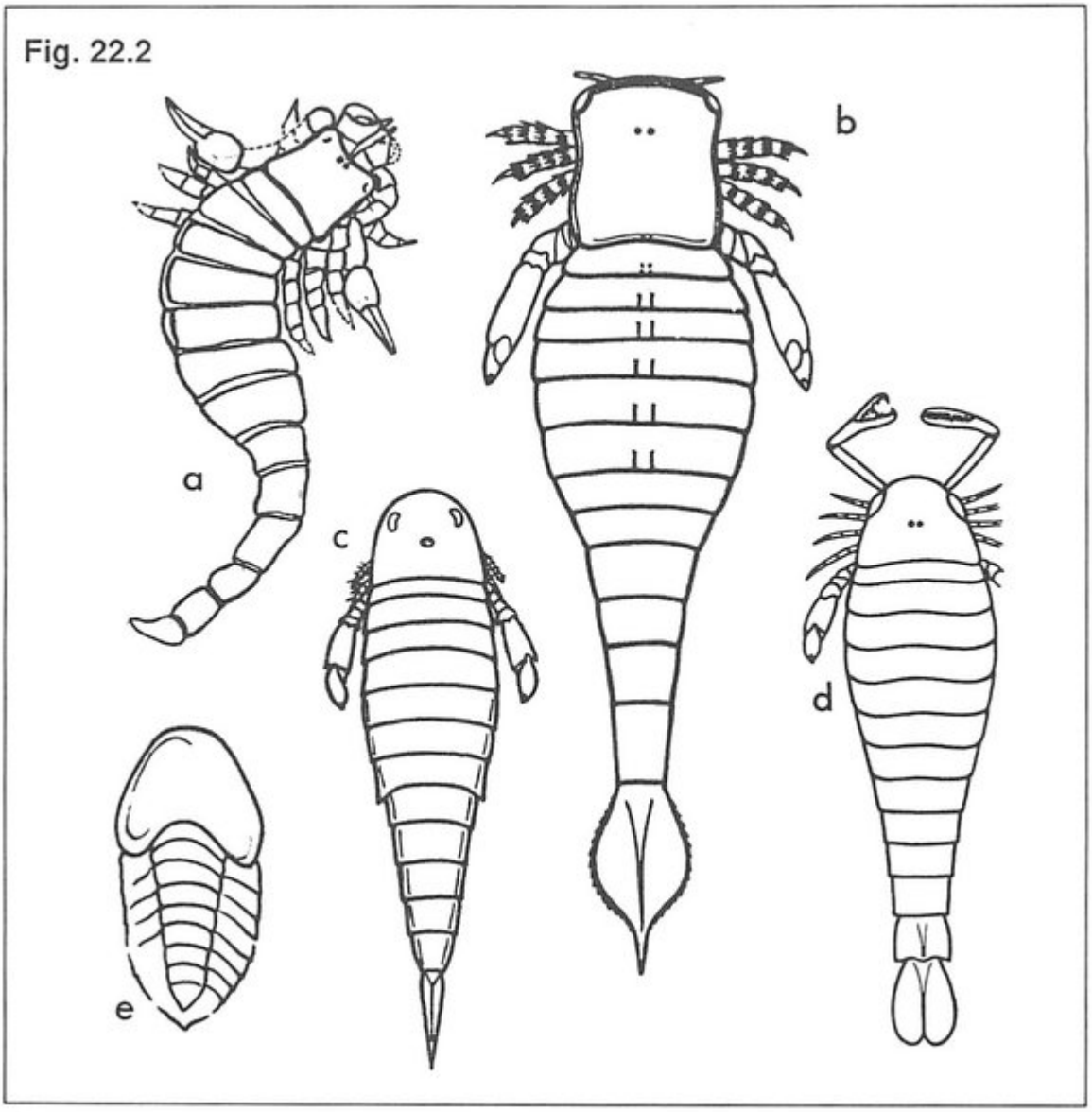


(Figure 22.1) Some of the fossils at the Jamoytius horizon: two-thirds natural size unless otherwise indicated. a-e, jawless fish: a, anaspid Jamoytius kerwoodi (after Miles and Ritchie); b-e, Logania [Thelodus] scotica, b, dorsal aspect as it appears flattened in the rock, (after Traquair); c-e, details of skin denticles; c, head denticle, × 24; d, e, trunk denticles; showing d, how they occur on the body, × 8, e, × 24 (c, e, after Gross; d, after Traquair) f, g, crustaceans; f, water-flea Beyrichia cf. kloedeni. × 6 (modified from Henningsmoen); g, pod-shrimp Ceratiocaris papilio, (after Rolfe); h, ?sea-squirt Ainiktozoon loganense (after Ritchie; i, fragment of the possible crustacean Dictyocaris × 114 (after Størmer), stipple indicates network ornament.



(Figure 22.2) Some of the fossil chelicerates from the Jamoytius horizon. a, ?aquatic scorpion Allopalaeophonus caledonicus × 2112 (after Petrunkevitch); b-d, eurypterids (water-scorpions, after Størmer); b, Slimonia acuminata × 116; c, Hughmilleria lanceolata × 112; d, Erettopterus [Pterygotus] bilobus, × 1/6; e, early king crab Cyamocephalus loganensis × 2/3 (after Stormer) The eurypterids are rare at this horizon, but occur more abundantly at Shank Castle, Dunside.