4. SUPPLEMENTARY NOTES on *ACLISINA* DE KONINCK and *ACLISOIDES* DONALD, with DESCRIPTIONS of NEW SPECIES. By JANE LONGSTAFF (*née* DONALD), F.L.S. (Communicated by Dr. G. B. LONGSTAFF, M.A., F.G.S. Read May 2nd, 1917.)

[PLATES V & VI.]

IN 1898 I communicated a paper to this Society on the genus *Aclisina* and on *Aclisoides*, a new section or subgenus of *Murchisonia*. Since that date I have had the opportunity of studying a larger number of specimens, which has not only enabled me to learn more about the species then described, but also to add to their number.

Fifteen species of *Aclisina* with several varieties, and a single species of *Aclisoides* with one variety, were dealt with in 1898. I am now referring seven more species to the former, six of which have not been previously noted, and am regarding the form considered a variety of the latter as a distinct species. Thus we have a total of twenty-two possible species of *Aclisina* and two of *Aclisoides*. In addition to these there are in the Sedgwick Museum, Cambridge, three small shells resembling *Aclisina*, one from Poolvash, the others from Settle, all too much embedded in the matrix to be accurately determined.

The numbers given can only be regarded as approximate, for paucity of specimens and defects in the manner of preservation sometimes render the definition of genera and species difficult. It is, therefore, possible that some shells at present considered as distinct species may afterwards prove to be varieties only, while others now grouped together may need to be separated.

In the previous paper no holotypes were selected. I am now supplying the omission, and also stating in which collections they are deposited.

Although I have already remarked on the beautiful state of preservation of many of the Scottish specimens, it may not be amiss to draw attention to it again. No less than thirteen species of *Aclisina* and one of *Aclisoides* have the protoconch well preserved. In the latter it is attached to the post-embryonic whorl and simply coiled on the same plane, and thus in no wise peculiar. But in *Aclisina* it is markedly so, being more or less irregular. In six species the protoconch stands up, forming a wide angle with the post-embryonic whorl; in four it is not so much raised, but is oblique and overhangs the spire; in the remaining three it is wholly attached, forming a broad flat apex.

The material at hand is not sufficient to show to how great an extent variation in the character of the protoconch of a species may take place, either in the same beds, or in those separated by time or

space. In no instance have I observed a species including individuals with the protoconch greatly elevated and others with it flat. In two species, *Aclisina micula* and *A. striatissima*, I have noted very slight variation. Only two examples of the former are known to me: in one the protoconch adheres closely, in the other it is a little raised, and in one example of *A. striatissima* (Pl. VI, fig. 4) it is flatter than in the type. In some shells one or more of the upper whorls of the spire are unattached, as well as the protoconch: as, for instance, *A. aciculata* (Pl. VI, fig. 6). The protoconch is frequently more translucent than, or of a different colour from, the rest of the shell.

I have previously noted that the Scottish Gasteropoda as a whole are small. There are, however, exceptions to this, for at Craigenglen and Strathavon, both near the base of the Lower Limestone Series, larger shells occur, equalling in dimensions individuals of the same species at Settle and Visé. Mr. Peter Macnair suggests that this may be the result of the clear-water conditions which prevailed during the deposition of the beds at these localities. It is remarkable that the most minute examples occur at Glencart, Dalry, near the top of the Upper Limestone Series; the peculiar character of the deposit in which they were found was described by Dr. John Young, and also referred to by me.

Aclisina and *Aclisoides* are not associated together in this paper on account of a supposed close relationship, but because, owing to a superficial resemblance, a species of the latter had been mistaken for a member of the former. I have discussed the possible affinities of *Aclisina*, and have shown that it bears a great likeness to *Promathildia* Andr, which genus was then included by some palontologists in the family Turritellid. Koken considered that *Aclisina* might be the direct forerunner of certain Turritell. M. Cossmann has since created the family Mathildiid:¹ thus it is now a question whether *Aclisina* should not find a place there in proximity to *Promathildia*. If this were the case, *Aclisina* would be the most ancient member of the group as now constituted.

A far greater number of species of *Aclisina* have been found in Scotland than in any other country. Of the twenty-two recorded only one is peculiar to England, and one, or at most two, to Ireland. The former is the fossil described by Mr. Bolton as *Loxonema ashtouense* from the basement-beds of the Bristol Coal-field. One of the Irish species, *A. sulcatula* (McCoy), has not been observed elsewhere; the other, *A. polygyra* (McCoy), is probably conspecific with *A. elongata* (Fleming), but the holotype is so much embedded in the matrix that it is difficult to be certain of this.

With regard to the species occurring in Scotland, it may be

¹ 'Essais de Paloconchologie Compare,' vol. ix (1912) p. 2. After writing the above I received vol. x (1915) of this work, and I observe that on p. 259 M. Cossmann does not consider *Aclisina* to be related to *Turritella*, but states that 'l'intermdiaire entre *Loxonema* et *Mathildia* est manifeste.'

noted that the variety *exigua* of *Aclisina pulchra* De Koninck and *A. elongata* (Fleming) have the most extended range, the former making its appearance in the Calciferous Sandstone Series, and continuing throughout the Lower Limestone Series and the Upper Limestone Series into the Millstone Grit. In Belgium the species is only recorded from Tournai, where specimens attain a greater size than any Scottish variety that I have seen. *A. elongata* has a similar range in Scotland, except that it has not been recorded from the Millstone Grit. It also occurs in the Yoredale Series of England, and is probably represented in Ireland and Belgium. L. G. de Koninck figures a small gasteropod from Visé on pl. xxxiii, figs. 45 & 46, in 'Faune du Calcaire Carbonifère de Belgique' pt. iv, Ann. Mus. Roy. Hist. Nat. Belg. vol. viii (1883), which greatly resembles this species; but it is undescribed, as it was lost.

Eight species occur in both the Lower and the Upper Limestone Series: namely, *A. costatula*, *A. attenuata*, *A. aciculata*, *A. tenuistriata*, *A. quadrata*, *A. similis*, *A. striatissima*, and *A. ? multivolva*. Of these, *A. similis* and probably *A. striatissima* are found also in Belgium.

Five species are confined to the Lower Limestone Series: namely, *A. pusilla*, *A. parvula*, *A. terebra*, *A. elegantula*, and *A. venusta*.

Four are limited to the Upper Limestone Series: namely, *A. delicatula*, *A. faber*, *A. micula*, and *A. subelongata*.

A. grantonensis has only been found in the Calciferous Sandstone Series.

Of the two species referred to *Aclisoides*, *A. striatula* has the widest range, occurring in both the Lower and the Upper Limestone Series of Scotland, as well as in England, the Isle of Man, and Belgium; while *A. ? armstrongiana* is only known from the Lower Limestone Series of Scotland. This subgenus is confined to the Carboniferous Period.

In addition to the fourteen foreign Carboniferous species of *Aclisina* previously mentioned, three have been described by Miss Clara G. Mark,¹ and three others have been doubtfully referred to the genus by her; these latter, however, do not appear to possess the characteristic lines of growth. The three former are *A. formosa*, *A. conditi*, and *A. pumila*, from the Portersville Limestone, Conemaugh Formation.

Besides these, a new species from the Zechstein, *A. beneventa*,² has been described by E. Dietz, and also one from the Devonian, *A. fugitiva* Barrande, by Dr. Jaroslav Perner.³

This genus has been stated to range from the Devonian to the Permian: if, however, the species *A. obscura* Donald,⁴ doubtfully

¹ Geol. Surv. Ohio, ser. 4, Bull. 17 (1912) p. 314 & pl. xvi, figs. 7-10.

² Jahrb. K. Preuss. Geol. Landesanst. vol. xxx, pt. i (1911) p. 475 & pl. xv, fig. 1.

³ 'Système Silurien du Centre de la Bohême, vol. iv: Gastéropodes' vol. ii (1907) p. 372 & pl. cx, figs. 19-20.

⁴ Q. J. G. S. vol. lviii (1902) p. 337 & pl. ix, fig. 12.

referred to it from the Silurian, prove to be a true member, its origin must be more ancient.

I am greatly indebted to both Mr. R. G. Carruthers and Mr. Peter Macnair for information respecting the horizons at which the Scottish species occur. Their views agree in the main with regard to the Upper Limestone Series. But for the Lower Limestone and Calciferous Sandstone Series I have been guided by Mr. Macnair, whose recent extensive studies of the stratigraphy of these beds have led him to differ from the Geological Survey. He considers that there is no marked break between the strata of the Calciferous Sandstone Series and the succeeding Lower Limestone Series, and refers to the latter all the sedimentary rocks (including the Hollybush Limestone) that occur above the Calciferous-Sandstone lavas of the West of Scotland.

In Proc. Geol. Assoc. vol. xxvi, pt. 3 (1915) p. 179, he describes the remarkably fine sections at Corrie Burn, Kilsyth (Stirlingshire), and on p. 181 sums up thus:

‘The main points of difference between this reading of the succession and that of the Geological Survey is that in the north of Ayrshire they take the Dockra Limestone as the Hurlet, the four succeeding limestones being respectively the Blackhall, Main Hosie, Mid Hosie, and Top Hosie. In Fife they take the Seafeld Limestone as the Hurlet; this is my Main Hosie. In the Bilston Burn, Midlothian, they take the Gilmerton Limestone as the Hurlet, whereas my Hurlet datum-line lies about 200 feet below the Gilmerton Limestone.’

Mr. Macnair regards the Dockra Limestone as underlying the Hurlet, and as being equivalent to the Blackbyre Limestone of Kilsyth, Campsie, and Hurlet. In several communications to the Geological Society of Glasgow, published in their Transactions during the years 1912–16, he supplies further details, and deals with the correlation of these strata with those in Lanarkshire.

No species of *Aclisina* and *Aclisoides* have been recorded from the Hurlet Limestone as here defined; this is not, however, remarkable, since they are mostly small forms, and Mr. John Smith¹ states that there is a great scarcity of fossils in this stratum.

The beds at Penton Linns (Dumfriesshire) have not been carefully zoned, therefore it is impossible to state the exact position of those from which the gasteropods here described are derived. The undersides of the slabs are crowded with *Productus longispinus* Sowerby, and there are numerous spines and fragments of the brachiopods above. Dr. J. Horne & Dr. B. N. Peach² give a short list of fossils from this locality in their account of the Canonbie Coalfield, and state that they recall the assemblage of organic remains of the Lower Limestone Series of Central Scotland.

The exact relationship of the Scottish strata with the English has not been thoroughly worked out, therefore the reference to

¹ Trans. Geol. Soc. Glasgow, vol. xiv, pt. ii (1911) p. 141.

² Trans. Roy. Soc. Edin. vol. xl (1903) p. 850.

the late Dr. Arthur Vaughan's zones can only be regarded as temporary and approximate.

Prof. E. J. Garwood has very kindly given me his views, based on the information at present available. He considers the Lower Limestone Series to be homotaxial with D_1 - D_2 , and the Upper Limestone Series with D_7 - D_8 . The Settle Limestone is S_2 and D_1 . Widdale Fell, Mosedale, is D_7 .

The Upper Limestone of Poolvash (Isle of Man) is probably D_1 - D_2 . Mr. J. Smith's gasteropoda came from the partly dolomitized upper limestone east of the Balladoole Fault, Poolvash. He believes the horizon to be lower than that of the Hurlet Limestone of the West of Scotland.

With regard to the Irish localities, Cullion, Draperstown, and Carrickoughter, Kesh, Prof. G. A. J. Cole states that the districts require careful zoning before the exact positions can be ascertained. Dr. Vaughan considered that the former might be homotaxial with C_1 of the Avon Section. The latter is probably at a much higher horizon.

A table is appended (pp. 64-67) with names of species, localities, and the Scottish horizons. These latter are, for the greater part, called after the characteristic limestone; the fossils, however, are by no means restricted to that stratum, but are frequently found in the associated shales. There being very few records outside Scotland, it has not been considered necessary to give additional columns for their horizons, more especially as they are not very precisely defined at present. Since the localities are fully dealt with here, they are given under the descriptions only in the case of holotypes and rarer species. Also those alone from which I have actually seen specimens myself are stated. I have examined many of the gasteropoda to which names have been given in the Scottish Geological-Survey lists, and I find that these names are not in all cases to be depended upon. Confusion has probably arisen from grafting more recent nomenclature on the older. For instance, I have met with five distinct species referable to at least two genera, all grouped under one specific name, which was not applicable to any one of them. On the other hand, a single species occurs under two different names.

In order to save space, only such parts of the synonymy are repeated as are essential for clearness.

Most of the small specimens were drawn with the camera lucida on the microscope, and the approximate magnification is given in each case.

For the loan of specimens I offer my most hearty thanks to those in charge of the Geological Survey Collections in London and Edinburgh; to the Council of the Hancock Museum, Newcastle-upon-Tyne; to the late Prof. McKenny Hughes, Sedgwick Museum, Cambridge; to Dr. Ritchie, Royal Scottish Museum, Edinburgh; to Mr. Peter Macnair, Glasgow Museum, Kelvin-grove; and to Mr. Herbert Bolton, Bristol Museum. I desire also to express my gratitude to Mr. Robert Dunlop, Dunfermline,

<i>Actisina costatula</i>	<i>dubia</i> Donald.	Craigenglen. High Smithston; Moss Mullock.	X							X	70
<i>Actisina delicatula</i> , sp. nov.		Glencart.									71
<i>Actisina elegantula</i> Donald.		Law; Dykes.	X							X	74
<i>elongata</i> (Fleming).		Randerstone (Fife). Craigenglen; Penton ² ; Craw- field; Beith.	X								72
		Law; Dykes.		X							
		Elie (Fife).									
		Brankam Hall; High Blantyre; Capelrig; Boghead.									
		Orchard; Thornliebank. Wellwood. ⁴									
		Glencart.									
		Noss Mullock.									
<i>Actisina elongata</i>	<i>cingulata</i> Donald.	Widdale Fell, Mosedale. Craigenglen; Penton ² ; Crawfield.	X X							X	73
		High Blantyre; Capelrig.									
<i>Actisina elongata</i>	<i>varians</i> Donald.	Glencart. Craigenglen. Dykes.	X							X	73
		Elie.									
<i>Actisina faber</i> , sp. nov.		Brankam Hall; Capelrig. High Smithston.									70
<i>grantonensis</i> Donald.		Glencart.								X	76
<i>micula</i> , sp. nov.		Randerstone? Woodhall, Edinburgh.									71
<i>? multicocta</i> Donald.		* Moss Mullock; High Smithston.	X							X	77
<i>parrula</i> Donald.		Bankend; Brockley. Glencart.									75
		Moss Mullock. Crawfield.								X	
		Law; Dykes.	X								

¹ The type locality is in every case printed in spaced letters.

² The beds at this locality possess a fauna suggestive of the lower part of the Lower Limestone Series, but they have not been accurately zoned.

³ Referred to the Index Limestone with a query, by Mr. J. Smith.

⁴ A short distance below the Calmy Limestone, according to Mr. J. Smith.

Mr. James Wright, Kirkcaldy, and Mr. John Smith, Dalry, for the privilege of examining examples in their private collections. Further, for assistance in many ways I am greatly obliged to Dr. A. Smith Woodward, F.R.S., Dr. F. A. Bather, F.R.S., Prof. E. J. Garwood, F.R.S., Dr. F. L. Kitchin, the late Mr. G. C. Crick, Dr. F. R. Cowper Reed, Dr. Lee, Prof. S. H. Reynolds, Prof. G. A. J. Cole, M. Louis Dollo, and M. Douvillé.

Genus ACLISINA De Koninck.

ACLISINA PULCHRA De Koninck. (Pl. V, figs. 1 & 2 a-2 b.)

Aclisina pulchra De Koninck, 1881, 'Faune Calc. Carb. Belg.' pt. iii, Ann. Mus. Roy. Hist. Nat. Belg. vol. vi, p. 87 & pl. vii, figs. 26-27.

Remarks.—L. G. de Koninck represents this species as having the whorls ornamented by seven or eight spiral grooves and ridges of equal size. In reality, however, the upper ridges, from 1 to 3 in number, are finer than the three or four below, and on the body-whorl these latter are followed by numerous still finer ridges, one or two of which frequently show above the suture on the penultimate whorl. On the earlier whorls only one of the three finer ridges exists, it is immediately below the suture. None of the Belgian specimens that I have seen has the apex intact. The sigmoidal form of the outer lip is well preserved in a specimen (Pl. V, fig. 2) in the collection of Canon H. de Dorlodot: this character is only indicated by the lines of growth in all the other species of the genus that I have examined.

So far, I have not met with any typical specimens of this species in the British Isles.

Holotype.—*Op. cit.* pl. vii, figs. 26 & 27. Also Pl. V, fig. 1 of this paper.

There are two smaller examples associated with the holotype in the Musée Royale d'Histoire Naturelle at Brussels, also a good specimen in the British Museum (Natural History), and I have two others purchased from M. Piret.

Locality and horizon.—Tournai (Assise i).

ACLISINA PULCHRA, var. EXIGUA, nom. nov.

Aclisina pulchra var. *tenuis* (De Koninck) Donald, 1898, Q. J. G. S. vol. liv, p. 52 & pl. iii, figs. 1-4.

Remarks.—I referred a small Scottish variety of *A. pulchra* to *Murchisonia tenuis* De Koninck, because I found that it agreed with the best-preserved shells on a tablet so named in the Brussels Museum. During a subsequent visit a further examination of this tablet convinced me that there were two distinct species on it. The specimen marked as holotype is much worn, and has only three somewhat coarse threads ornamenting the whorl; two of the eight examples associated with it are the same, and they all look like immature shells. The remaining five are different, and are conspecific with the Scottish shells. These latter greatly resemble

the typical *A. pulchra*, but they are much smaller and rather more slender. At least eight and twenty Scottish specimens are remarkable for having the protoconch intact, and some also exhibit the characteristic sigmoidal lines of growth.

Holotype.—*Op. cit.* pl. iii, fig. 2. In the Neilson Collection, Royal Scottish Museum, Edinburgh.

Locality and horizon.—Robroyston, Glasgow, in the Upper Limestone Series.

Unfortunately the finer specimen (fig. 1) from Swindridge Muir, Ayrshire, also in the Upper Limestone Series, has perished by fire. There are, however, numerous examples from this locality in the Young, Neilson, and my own collections.

Specimens in Mr. J. Smith's collection from the Index Limestone at Highfield, Dalry, and Dernshaw, Stewarton, have the protoconch preserved, as well as those previously mentioned from the last-named locality.

ACLISINA PULCHRA, var. INTERMEDIA Donald.

Aclisina pulchra, var. *intermedia* Donald, 1898, *op. cit.* p. 53 & pl. iii, figs. 5-5a.

Remarks.—Specimens previously referred to this variety from Swindridge Muir are most probably *A. costatula*.

Holotype.—*Op. cit.* pl. iii, figs. 5 & 5a. Bennie Collection, Royal Scottish Museum, Edinburgh.

Locality and horizon.—Law, Dalry (Ayrshire), in the Lower Limestone Series.

ACLISINA VENUSTA, sp. nov. (Pl. V, figs. 3a & 3b.)

Diagnosis.—Shell elongated, conical, composed of more than seven whorls. Whorls convex, ornamented on the lower part by four threads, the two upper of which are the strongest and farthest apart; midway between these and the suture are two finer ones, and on the body-whorl there are two additional fine threads below. Sutures deep. Base convex, slightly produced. Inner lip reflected. Columella nearly straight.

Remarks.—From *A. pulchra* this species may be distinguished by being more slender and having more regularly convex whorls. It is most like the variety *intermedia*, but is of much greater size, and has also two fine threads on the upper part of the whorl. We have, however, only one example of each of these forms; it is therefore possible that the discovery of intermediate links might prove them to be the extremes of a single species or variety.

Holotype.—Pl. V, figs. 3a & 3b, Bennie Collection, Royal Scottish Museum, Edinburgh.

Dimensions.—Length=8 millimetres; width=3 mm.

Locality and horizon.—Law, Dalry, in the Lower Limestone Series.

ACLISINA FABER, sp. nov. (Pl. V, figs. 4 & 5 a-5 c.)

Diagnosis.—Shell small, conical, composed of more than nine whorls. Whorls broad, convex, slightly flattened above and sub-angular near the middle. Lower part ornamented by six moderately strong threads with two additional ones on the body-whorl; upper part ornamented by three fine threads; base covered by numerous still finer ones. Protoconch composed of little more than one smooth volution, moderately raised and slightly overhanging the succeeding whorl. Aperture subcircular. Columella nearly straight. Inner lip reflected.

Remarks.—This species somewhat resembles *A. pulchra*, but it has more convex whorls ornamented by finer and more numerous threads, also the protoconch is more orbicular and not so erect.

Holotype.—The larger specimen represented in Pl. V, fig. 4, must be regarded as the holotype; it consists of nine whorls the length of which=6 mm., and the width=2.5 mm. The smaller shell (fig. 5) is remarkable for having the protoconch intact; its length=1.75 mm. Both are in Mr. John Smith's collection.

Locality and horizon.—High Smithston, Kilwinning (Ayrshire), in the Upper Limestone Series.

Three small shells in my own collection appear to belong to this species. They are from Glencart, Dalry, also in the Upper Limestone Series.

ACLISINA COSTATULA Donald.

Aclisina costatula Donald, 1898, *op. cit.* p. 56 & pl. iii, figs. 12-14.

Holotype.—*Op. cit.* pl. iii, fig. 12. Longstaff Collection.

Locality and horizon.—Penton Linns, Liddel Water (Dumfriesshire). Lower Limestone Series.

ACLISINA COSTATULA, var. *DUBIA* Donald.

Aclisina costatula var. *dubia*, Donald, 1898, *op. cit.* p. 57 & pl. iii, fig. 15.

Remarks.—The examination of a large number of specimens shows that *A. costatula* exhibits a certain amount of variation. I suggested the name *dubia* for a large variety having somewhat higher whorls. Unfortunately the original example has perished by fire with the late Mr. Thomson's collection. There is, however, a shell in Mr. J. Smith's collection greatly resembling it in every way. It has six whorls intact, which have a length of 5.5 millimetres.

Locality and horizon.—Whereas the original was from Craigenglen, Campsie (Stirlingshire), in the Lower Limestone Series, this specimen is from Moss Mullock, in the Upper Limestone Series.

ACLISINA ATTENUATA Donald.

Aclisina attenuata Donald, 1898, *op. cit.* p. 58 & pl. iv, figs. 2-3.

Holotype.—*Op. cit.* pl. iv, fig. 2. Longstaff Collection.

Locality and horizon.—Glencart, Dalry, in the Upper Limestone Series.

ACLISINA DELICATULA, sp. nov. (Pl. V, figs. 6 a-6 c.)

Diagnosis.—Shell slender, composed of eleven gradually increasing whorls. Whorls convex, broad and low. Ornamentation consisting of five moderately strong threads on the lower part of each whorl, with numerous additional finer ones below on the body-whorl; higher part of the whorl apparently smooth. Lines of growth unknown. Apex broad and nearly flat. Protoconch consisting of about one smooth whorl coiled on almost the same plane as the rest of the spire to which it is attached. Base convex, but little produced. No umbilicus. Aperture ovoid. Columella nearly straight, curving round at the bottom to meet the outer lip. Inner lip reflected on the body-whorl.

Remarks.—This species resembles *A. costatula* in ornamentation, but the form is not so slender and the whorls are more convex. The protoconch of the only known specimen is intact, but is somewhat worn, and probably is slightly crushed, so that it may not originally have been so flat.

Holotype.—Pl. V, figs. 6 a-6 c. In my own collection, given to me by the late Dr. John Young.

Dimensions.—Length=4.25 millimetres; width=1.4 mm.

Locality and horizon.—Glencart, Dalry, in the Upper Limestone Series.

ACLISINA MICULA, sp. nov. (Pl. V, figs. 7 a & 7 b.)

Diagnosis.—Shell elongated, composed of about ten slightly convex whorls. Whorls broad, ornamented on the lower two-thirds by four threads, the two upper are the strongest and farthest apart; two additional fine threads on the body-whorl. Sutures of moderate depth. Base not produced. Aperture rounded. Protoconch flat and broad, attached to, or but slightly raised from, the spire.

Remarks.—*Aclisina micula* may be distinguished from *A. costatula* by its greater spiral angle, shallower sutures, more compactly coiled whorls, and in the protoconch being attached to the spire instead of standing up. It differs also from *A. attenuata* in being less slender, and in the lower threads being coarser. The only two specimens that I have met with show the protoconch intact; it adheres closely on one, while on the other (the holotype) it is very slightly raised.

Holotype.—Pl. V, figs. 7 a & 7 b. Smith Collection.

Dimensions.—Length=3.5 millimetres; width=1 mm.

Locality and horizon.—High Smithston, Kilwinning. Upper Limestone Series.

The other example is from Moss Mullock, Kilwinning, at the same horizon and in the same collection.

ACLISINA SIMILIS Donald. (Pl. V, fig. 8.)

Aclisina similis Donald, 1898, *op. cit.* p. 57 & pl. iii, fig. 16, pl. iv, fig. 1.

Aclisina pusilla Donald, 1898, *pars, op. cit.* p. 63 & pl. iv, fig. 15 [exclude figs. 14, 14 a, & 14 b.]

Remarks.—About sixteen specimens of this species have been examined, but only one has the protoconch intact (Pl. V, fig. 8). It is in Mr. J. Smith's collection, and was found by him at High Smithston, in the Upper Limestone Series.

Holotype.—*Op. cit.* pl. iv, fig. 1. Bennie Collection, Royal Scottish Museum, Edinburgh.

Locality and horizon.—Law, Dalry, in the Lower Limestone Series.

ACLISINA PUSILLA Donald. (Pl. V, fig. 9.)

Aclisina pusilla Donald, 1898, *op. cit.* p. 63 & pl. iv, figs. 14, 14a, & 14b [exclude fig. 15].

? *Aclisina parvula* Donald, 1898, *pars, op. cit.* p. 64 & pl. v, figs. 2, 2a, & 2b.

Remarks.—This species is distinguished by its slender form, flattened whorls, and relatively broad, flat apex. The examination of a number of specimens shows that there is a slight variation in the strength of the ornamenting threads. The example of which a portion of a whorl is figured (*op. cit.* pl. iv, fig. 15), from Glencart, is really *A. similis*, a species which *A. pusilla* greatly resembles; but the latter is smaller, the whorls are lower, and the protoconch is flat. Several examples have the apex intact. It is probable that figs. 2, 2a, & 2b in pl. v. *op. cit.* represent an immature form of this species.

Holotype.—*Op. cit.* pl. iv, fig. 14. A figure (Pl. V, fig. 9) of the protoconch of this shell is given, as that previously drawn belonged to another specimen. Smith Collection.

Locality and horizon.—Law, Dalry. Lower Limestone Series.

Besides the holotype there are six additional specimens in the Bennie Collection, and one in the Young Collection from Law, Dalry; also seven from Dykes, Kilbirnie, in the Smith Collection. They are all from the Lower Limestone Series.

ACLISINA ELONGATA (Fleming). (Pl. V, figs. 10–12.)

Aclisina elongata (Fleming) Donald, 1898, *op. cit.* p. 54 & pl. iii, figs. 6–6a.

Remarks.—It is unfortunate that the holotype should be an exceedingly small specimen with the apex broken, consisting of four and a half whorls in a length of 2 millimetres. All the gasteropods from the same locality have similar dimensions. Most of the examples from Penton are of greater size; that figured in *op. cit.* pl. iii, fig. 6, is the largest, but it is not well preserved, being greatly crushed. The enlarged portion of a whorl (fig. 6a) is part of a fragment of a shell, showing the ornamentation and contour distinctly, and on the same slab with it are two smaller specimens fairly preserved, one of which has twelve whorls with a length of 5.5 millimetres. Many of the examples from Law, Dalry, exhibit the ornamentation and contour well, as they are preserved in such a manner as to be easily detached from the matrix. Mr. R. Dunlop possesses an exceedingly fine series of about forty

specimens from Elie (Fife), which show a certain amount of variation in the ornamentation, there being intermediate forms merging into the variety *varians*. In Mr. J. Smith's collection there is a remarkably perfect young example with apex and aperture intact; it consists of seven whorls besides the protoconch in a length of 2.25 millimetres (Pl. V, fig. 12). It is from Dykes, Kilbirnie (Ayrshire), in the Lower Limestone Series. One of the best preserved shells was found at Crawfield, Beith, and is figured (Pl. V, fig. 11).

Holotype.—Ure Collection, Royal Society, Edinburgh. Pl. V, fig. 10.

Locality and horizon.—Lauriston (Brankam Hall), Lanarkshire, in the Lower Limestone Series.

ACLISINA ELONGATA, var. VARIANS Donald. (Pl. V, fig. 15.)

Aclisina elongata, var. *varians* Donald, 1898, *op. cit.* p. 55 & pl. iii, fig. 9.

Remarks.—This variety is especially well represented at Craigenglen. In Mr. J. Smith's collection there are two young specimens with the protoconch intact; the back view of one is given in Pl. V, fig. 15. They are from the Lower Limestone Series at Dykes, Kilbirnie.

Holotype.—*Op. cit.* pl. iii, fig. 9. Ure Collection, Royal Society, Edinburgh.

Locality and horizon.—Lauriston (Brankam Hall), in the Lower Limestone Series.

ACLISINA ELONGATA, var. CINGULATA Donald. (Pl. V, figs. 13 & 14.)

Aclisina elongata, var. *cingulata* Donald, 1898, *op. cit.* p. 55 & pl. iii, figs. 10 & 10a; ? figs. 7a–7c.

Remarks.—This variety is distinguished from the type by the whorls being usually higher, as well as by the difference in ornamentation. An example larger than that previously figured is given in Pl. V, figs. 13a & 13b, as it shows the variation in the ornamenting threads more distinctly. It is from the same locality, and is in the same collection. The protoconch previously referred to this variety (pl. iii, figs. 7a–7c) most probably belongs to *A. tenuistriata*. The specimen is contorted, and the ornamentation is indistinct. Mr. J. Smith has a remarkably well-preserved example of this variety with the protoconch, which is figured in Pl. V, fig. 14. Since the protoconchs of the typical form and the two varieties resemble one another, only one figure of each is given, taken from different aspects. They are all from Dykes.

Holotype.—*Op. cit.* pl. iii, figs. 10 & 10a. Young Collection, Glasgow Museum.

Locality and horizon.—Glencart, Dalry, in the Upper Limestone Series.

ACLISINA POLYGYRA (McCoy).

Aclisina polygyra McCoy, Donald, 1898, *op. cit.* p. 71 & pl. iii, fig. 11, quoted as *Luxonema polygyra* McCoy on p. 55, and referred with doubt to *Aclisina elongata* (Fleming).

Holotype.—‘Syn. Char. Carb. Foss. Irel.’ pl. iii, fig. 1. Griffith Collection, National Museum, Dublin.

Locality and horizon.—Cullion, Draperstown. Lower part of the Carboniferous Limestone.

ACLISINA ? *SULCATULA* (McCoy).

Loxonema sulcatula McCoy, 1844, ‘Synopsis of the Characters of the Carboniferous Limestone Fossils of Ireland’ p. 30 & pl. v, fig. 6.

Aclisina ? *sulcatula* Donald, 1898, Q. J. G. S. vol. liv, p. 64 & pl. v, fig. 3.

Holotype.—‘Syn. Char. Carb. Foss. Irel.’ pl. v, fig. 6, and Q. J. G. S. vol. liv, pl. v, fig. 3. Griffith Collection, National Museum, Dublin.

Locality and horizon.—Carrickoughter, Kesh. Probably high in the Lower Carboniferous Series.

ACLISINA SUBELONGATA, sp. nov. (Pl. VI, fig. 1.)

Diagnosis.—Shell elongated, turriculated, composed of more than ten whorls. Whorls angular, flattened above, slightly convex below. Ornamentation consisting of a strong thread on the angle with one above and three below, space immediately above the angle rather wider than those below, four or five additional very fine threads on the base. Aperture not well preserved. Columella nearly straight. Sutures deep.

Remarks.—This species greatly resembles *A. elongata* (Fleming), but the spiral angle is rather wider, the whorls are more angular, and the threads ornamenting the spire fewer and coarser.

Holotype.—Pl. VI, fig. 1. Though small this specimen is almost entire. Length=4.25 millimetres; width=1.25 mm. In Mr. John Smith’s collection.

Locality and horizon.—Moss Mullock, Kilwinning, in the Upper Limestone Series.

There is another example from this locality in the same collection, as well as one from Glencart, Dalry, also in the Upper Limestone Series. The Young Collection, Kelvingrove Museum, Glasgow, contains two specimens from Glencart, one of which is bigger, having nine whorls in a length of 8 mm.; both apex and base are broken. A shell in the Museum of Practical Geology, London, appears to belong to this species; it is, however, much larger and is somewhat crushed. The exact locality is not stated, only ‘Glasgow’ being given. It has the appearance of specimens derived from the Lower Limestone Series, where they frequently attain a greater size than those from the Upper Limestone Series. Its length=14 millimetres for seven whorls, the greatest width of which=5.5 mm.

ACLISINA ELEGANTULA Donald. (Pl. VI, fig. 2.)

Aclisina elegantula Donald, 1898, *op. cit.* p. 62 & pl. iv, figs. 13, 13 a-13 c.

Remarks.—Besides the specimens previously mentioned from Law, Dalry, and Cunninghambaidland (Ayrshire), Mr. Smith’s

collection contains some from Dykes, Kilbirnie, one of which has the protoconch well preserved. A new drawing (Pl. VI, fig. 2) of the protoconch of the original example is given, as the figure 13 *b* does not show that it slightly overhangs the spire. With the exception of the holotype most of the specimens found are small, and if it were not for the existence of a shell of intermediate size, these small examples might be considered to constitute a distinct species.

Holotype.—*Op. cit.* pl. iv, fig. 13. Collection of Mr. John Smith.

Locality and horizon.—Law, Dalry, in the Lower Limestone Series.

The medium-sized specimen is from the same locality, and is in the same collection.

ACLISINA PARVULA Donald.

Aclisina parvula Donald, 1898, *op. cit.* p. 64 & pl. v, fig. 1, ? fig. 2.

Remarks.—*A. parvula* differs from *A. pusilla* by its more convex whorls, deeper sutures, and greater spiral angle. There are two additional specimens in the collections of Mr. Bennie and Mr. Smith, which occurred respectively at Law, Dalry, and Dykes, Kilbirnie, in the Lower Limestone Series. I feel doubtful about the specimen represented by fig. 2 being really this species, and I think that it is most probably an immature example of *A. pusilla*.

Holotype.—*Op. cit.* pl. v, fig. 1. Longstaff Collection.

Locality and horizon.—Crawfield Quarry, Beith (Ayrshire), in the Lower Limestone Series.

ACLISINA TEREBRA Donald.

Aclisina terebra Donald, 1898, *op. cit.* p. 63 & pl. iv, fig. 16.

Holotype.—*Op. cit.* pl. iv, fig. 16. Young Collection, Kelvin-grove Museum, Glasgow.

Locality and horizon.—Crawfield Quarry, Beith, in the Lower Limestone Series.

There is another specimen in my own collection from Law, Dalry, also in the Lower Limestone Series.

ACLISINA STRIATISSIMA Donald. (Pl. VI, figs. 3 & 4.)

Aclisina quadrata var. *striatissima* Donald, 1898, *op. cit.* p. 61 & pl. iv, fig. 12.

Remarks.—I consider that this form should be regarded as a distinct species rather than as a variety of *A. quadrata*. Unfortunately, the shell originally figured has perished with the Hunter-Selkirk Collection. I therefore suggest as holotype the specimen mentioned at that time as having been presented to me by Dr. John Young, from the same locality. It is broken, and only six whorls remain, which = 3.25 millimetres in length, and not quite 1 mm. in width. The surface is well preserved, and shows the ornamenting striae distinctly. I figure now the protoconch

(Pl. VI, fig. 4) of another small example, also given to me by Dr. John Young, as it is slightly flatter than that of the shell originally figured. Besides the specimens formerly mentioned, Mr. J. Smith has four from the Lower Limestone Series of Dykes, Kilbirnie, and one from the Upper Limestone Series of High Smithston, Kilwinning. In the Liège Museum I observed a shell from Visé resembling this in shape and ornamentation, but much larger: the four lower whorls, which alone are preserved, have a length of 5.5 millimetres and greatest width of 2.25 mm.

Holotype.—Pl. VI, fig. 3. Longstaff Collection.

Locality and horizon.—Law, Dalry, in the Lower Limestone Series.

ACLISINA TENUISTRIATA Donald. (Pl. VI, fig. 5.)

Aclisina tenuistriata Donald, 1898, *op. cit.* p. 60 & pl. iv, fig. 10.

? *Aclisina elongata*, var. *cingulata* Donald, 1898, *pars, op. cit.* p. 55 & pl. iii, figs. 7 a-7 c [exclude figs. 10 & 10 a].

Remarks.—As this species appears to be rare, it is interesting to record that Mr. J. Smith has three additional well preserved specimens, one from Moss Mullock, in the Upper Limestone Series, one from Craigenglen, and the third from Law, Dalry, in the Lower Limestone Series. He has also two worn shells, which probably belong to this species, from the last-named locality. The example from Moss Mullock has the protoconch intact: it stands up detached from the post-embryonic whorl, and is nearly orbicular in form.

Holotype.—*Op. cit.* pl. iv, fig. 10. Longstaff Collection.

Locality and horizon.—Penton Linns, Liddel Water (Dumfries), in the Lower Limestone Series.

ACLISINA GRANTONENSIS Donald.

Aclisina grantonensis Donald, 1898, *op. cit.* p. 60 & pl. iv, figs. 7-9.

Holotype.—*Op. cit.* pl. iv, fig. 7. Geological Survey Collection, Royal Scottish Museum, Edinburgh.

Locality and horizon.—Woodhall, near Edinburgh, in the Calciferous Sandstone Series. Four specimens in the Kirkby Collection, Hancock Museum, Newcastle-upon-Tyne, appear to agree with this species. They are from Randerstone Castle, also in the Calciferous Sandstone Series.

ACLISINA QUADRATA Donald.

Aclisina quadrata Donald, 1898, *op. cit.* p. 61 & pl. iv, fig. 11.

Remarks.—Since this is one of the rarer species, it is worth noting the existence (in Mr. J. Smith's collection) of a specimen from the same locality as the holotype, and also of others from High Smithston and Moss Mullock, Kilwinning, in the Upper Limestone Series.

Holotype.—*Op. cit.* pl. iv, fig. 11. Bennie Collection, Royal Scottish Museum, Edinburgh.

Locality and horizon.—Law, Dalry, in the Lower Limestone Series.

ACLISINA ACICULATA Donald. (Pl. VI, fig. 6.)

Aclisina aciculata Donald, 1898, *op. cit.* p. 59 & pl. iv, figs. 4-6.

Remarks.—In addition to the specimens previously recorded, there are twenty in Mr. John Smith's collection, six of which have the protoconch preserved: it is like that figured (*op. cit.* pl. iv, figs. 6*a*-6*c*). As the shell in the Hunter-Selkirk Collection, from which these drawings were made, has been destroyed by fire, it is especially fortunate that more examples are available. Two of the specimens not only have the protoconch raised, but the three higher whorls of the spire are remarkably drawn out and loosely coiled (Pl. VI, fig. 6). They are all from Dykes, Kilbirnie; that in the Hunter-Selkirk Collection was from Law, Dalry. Both localities are in the Lower Limestone Series.

Holotype.—*Op. cit.* pl. iv, fig. 4. Young Collection, Kelvin-grove Museum, Glasgow.

Locality and horizon.—Gillfoot, Carluke (Lanarkshire), in the Upper Limestone Series.

ACLISINA ? MULTIVOLVA, sp. nov. (Pl. VI, figs. 7 & 8.)

Diagnosis.—Shell elongated, turriculated, composed of more than nine gradually increasing whorls. Whorls angular near the middle, flat or slightly concave above, flat or barely convex below. Ornamentation consisting of a strong thread on the angle with three below, the lowest of which is only seen on the body-whorl and at the suture of the anterior whorls of the spire; above, there is a strong thread with a finer one close to it, and on one of the whorls there is an indication of a still finer thread above. Sutures deep. Base rather flat. Columella nearly straight. Apex and aperture unknown.

Remarks.—This species is most like *A. subelongata*, but differs in being more slender, and in having fewer and stronger ornamenting threads below the angle, while there is an additional finer one above.

It is impossible to place the species with certainty, as neither protoconch, aperture, nor lines of growth are preserved: it is therefore only referred to *Aclisina* provisionally.

I have met with six specimens, three of which are very small, and one is also more slender. This last is in the late Dr. John Young's collection, and occurred in the Upper Limestone Series at Glencart. The other two belong to Mr. J. Smith, and were also found in the Upper Limestone Series. The remaining three are of greater size, otherwise they exhibit similar characters in form and ornamentation. They are from the Lower Limestone Series, where it is not unusual for specimens of much larger dimensions to occur. One has seven whorls in a length of 11·5 millimetres, and the greatest width=4·5 mm. Originally it must have been more elongated, for it is compressed upwards, causing the lower whorls to be broader and shorter. This example is from Bankend (Lanarkshire). Only the anterior portions of the other two exist, consisting

of five and four whorls respectively. They are from Brockley, Lesmahagow.

Holotype.—I would select as holotype the smaller of Mr. Smith's specimens, as it is best preserved (Pl. VI, fig. 7). It consists of seven and a half whorls, the length of which = 4.25 millimetres and width = 1.25 mm.

Locality.—Moss Mullock.

ACLISINA ASHTONENSIS (Bolton). (Pl. VI, fig. 9.)

Loxonema ashtonense Bolton, 1907. Q. J. G. S. vol. lxiii, p. 464 & pl. xxx, figs. 17 a–17 c.

Remarks.—Mr. Bolton kindly lent me the holotype and numerous other specimens of this species from the same locality. I found that the lines of growth were discernible on three examples, and that they indicate the form of aperture characteristic of *Aclisina*. A figure of one of these is given in this paper (Pl. VI, fig. 9). On the later whorls there is a certain amount of irregularity in the ornamenting striae, three or four near the middle are generally stronger than the others, and the spaces between them are wider, while on the earlier whorls only one of the spaces is wider; sometimes very fine striae are intercalated between the coarser striae. This species greatly resembles *A. robusta* Stevens,¹ from the Coal Measures of Danville (Illinois), but it is somewhat smaller, the upper part of the whorl is flatter, and the lines of growth are more oblique.

Holotype.—*Op. cit.* pl. xxx, fig. 17 a, Bolton Collection, Bristol Museum.

Locality and horizon.—Ashton Vale Colliery, in the Basement-Beds of the Bristol Coalfield.

Genus *MURCHISONIA* D'Archiac & De Verneuil.

Subgenus *ACLISOIDES* Donald.

ACLISOIDES STRIATULA (De Koninck). (Pl. VI, figs. 10–15.)

Aclisina striatula De Koninck, 1881. 'Faune du Calcaire Carbonifère de Belgique' pt. iii. Ann. Mus. Roy. Hist. Nat. Belg. vol. vi, p. 86 & pl. ix, figs. 57–58; and 1883, pt. iv, vol. viii, pl. xxxiii, figs. 41–42, & pl. xxxiv, figs. 49–51.

Murchisonia striatula De Koninck, 1843, 'Description des Animaux Fossiles du Terrain Carbonifère de Belgique' p. 415 & pl. xl, figs. 7 a–7 b.

Murchisonia subsulcata De Koninck, 1843, *op. cit.* p. 416 & pl. xxxviii, figs. 4 a–4 c.

Aclisoides (*Murchisonia*) *striatula* De Koninck, Donald, 1898, Q. J. G. S. vol. liv, p. 67 & pl. v, figs. 6–8.

Aclisoides striatula, var. *armstrongiana* Donald, 1898, *op. cit.* p. 68 & pl. v, fig. 10 [exclude fig. 9].

Rhabdospira selkirkii Donald, 1898, *op. cit.* p. 65 & pl. v, fig. 4.

Remarks.—I have already stated the reason (*op. cit.* pp. 45, 46) why this species could not be placed in the genus *Aclisina*: namely, the presence of a sinus in the outer lip and a protoconch of different

¹ Amer. Journ. Sci. & Arts, vol. ii (1858) p. 259. See also F. B. Meek & A. H. Worthen, Geol. Surv. Ill. vol. v (1873) p. 596 & pl. xxix, figs. 6 a–6 b.

form. At that time I did not know of the existence of any of the types of De Koninck's earlier work ('Descr. Anim. Foss. Terr. Carb. Belg.' 1843), and founded my remarks on the type selected when he wrote his later work ('Faune Calc. Carb. Belg.' 1881 & 1883), which is in the Musée Royal d'Histoire Naturelle at Brussels, as well as on similar specimens from the same locality in that and other collections. I understood him to tell me that all his early types had gone to America; subsequently, however, I had occasion to visit the École des Mines, Paris, where through the courtesy of M. Douvillé I was shown some types which had been presented by De Koninck in 1846.¹ Among them were *Murchisonia striatula* (Pl. VI, figs. 10 & 11) and *M. subsulcata* (Pl. VI, fig. 13). At first sight they appeared to be distinct species as described, but a close study of them, as well as of a large series of both Belgian and British specimens, has convinced me that they are conspecific. Since De Koninck does not refer to *M. subsulcata* in his later work, he may have realized this, though he has not published it. In the Liège Museum I saw three individuals from Visé undoubtedly conspecific, two of which were marked *A. striatula* and the other *M. subsulcata*. The type specimens are more or less distorted by pressure. That of *M. subsulcata* is rather flattened, so that from one point of view the spiral angle appears greater than it must originally have been, and this defect is exaggerated in De Koninck's figures; the surface is also somewhat worn, therefore he describes it as having bands instead of threads and grooves. The two examples of *M. striatula* are compressed in such a manner as to make the whorls appear more angular; in one, consisting of the body and penultimate whorl, this is only slightly so, but in the other the distortion is greater, so that the sutures are rendered very oblique and the whorls still more angular; the ornamenting threads on both are well preserved. The specimen marked as the type of *Aclisina striatula* in the Brussels Museum is almost normal; but it is smaller, and the surface is much worn.

This species exhibits a certain amount of variation, both in form and in the number and strength of the ornamenting threads. In some shells the whorls are more exsert, as in two purchased from De Koninck by the British Museum (Natural History) G 19984, which are marked *M. striatula* in his own handwriting, in the specimen described as *Rhabdospira selkirkii*, and also in a small example from Hairmyres, Lanarkshire (Pl. VI, fig. 15). In the greater number of specimens, however, the earlier whorls are closely coiled and increase slowly, in such wise that they are lower and broader than the later whorls: thus these shells are somewhat convex in contour, and when immature have a greater spiral angle than the anterior portion viewed alone has. The holotype of *M. subsulcata* and many specimens from Settle have this compact form, (Pl. VI, fig. 13, & *op. cit.* pl. v, figs. 6-7), while the two types of

¹ Annuaire Géol. Univers. 1885, 'Musées & Collections Particulières, Paris, École des Mines, Coll. de Paléont.' p. 214.

M. striatula, which consist of the later whorls of larger shells, give the impression of having more slender spires (Pl. VI, figs. 10 & 11). Other individuals are intermediate, such as the Brussels type (Pl. VI, fig. 12) and some of the specimens from Strathavon, Lanarkshire.

The type example of *M. subsulcata* is remarkable for showing the sinus in the outer lip, while the other specimens with one exception only indicate it by the lines of growth. The sinus does not give rise to so distinct a band as in *Murchisonia, sensu stricto*, and is sometimes difficult to discern, being formed of from two to five threads similar to those ornamenting the rest of the surface. The position of the sinus is most evident on shells with a slightly worn surface. The majority of the specimens have fine threads intercalated between coarser ones, and two of the latter below the band are generally stronger than the others on the whorls of the spire.

I consider that the shell described by me as *Rhabdospira selkirkii* belongs to this species; it occurred as an external mould in the Main Lime at Braidwood, Carlisle, and has unfortunately been destroyed by fire in the Hunter-Selkirk Collection, so that it is now only represented by wax impressions. It is the anterior portion of a large specimen; the whorls are high, and show numerous ornamenting threads. From the markings on the surface I was led to think that the lines of growth were but slightly sinuated, and that there was not a distinct sinus. As there is evidence of a breakage near the aperture, and these markings are only observed in that vicinity, they are probably adventitious. The shape of the shell and disposition of the ornamenting threads greatly resemble some of the Belgian examples of *A. striatula*, especially the least crushed one in the École des Mines, Paris.

The specimen designated as the variety *armstrongiana* (*op. cit.* p. 68 & pl. v, fig. 9) must be regarded as a distinct species, and that represented by fig. 10 as merely a flattened and worn example of the typical form.

Holotype.—De Koninck did not select any one specimen as holotype. The two early types in the École des Mines, Paris, agree very nearly with his specific description; but the fragment (Pl. VI, fig. 11), consisting of two whorls alone, accords with the enlarged drawings, fig. 7 *b* of pl. xl, 'Anim. Foss. Terr. Carb. Belg.,' and fig. 58 of pl. ix, 'Faun. Calc. Carb. Belg.' It has a length of 10 millimetres, and its greatest width=7 mm.

The other shell (Pl. VI, fig. 10), consisting of five whorls, does not accord with either of the figures of a complete shell given in these works. The length=16 millimetres, and the greatest width of the penultimate whorl=8.25 mm.

The small worn specimen (Pl. VI, fig. 12) in the Royal Brussels Museum, marked as the type in the later work, does not correspond with any figure, although it belongs to the species. It consists of eight whorls in a length of 9.5 millimetres, and has a width of 3.5 mm.

The holotype of *M. subsulcata* has eight whorls in a length of 18.5 millimetres; its greatest width=6.75 mm., and the depth of the sinus=about 2.5 mm.

I give new drawings of these shells in Pl. VI, figs. 10-13, which should be compared with the figures 4, 6, 7, 8, & 10, of pl. v, Q. J. G. S. vol. liv (1898), as well as with figs. 14 & 15, Pl. VI, of this paper.

Locality and horizon.—Visé, Assise vi.

This species has previously been stated to occur at Settle¹ in England; at Craigenglen in the Lower Limestone Series, and at Glencart, Dalry, in the Upper Limestone Series, in Scotland. Specimens from the English locality greatly resemble in size and character those from Visé, as do also two from Craigenglen. One of these last is in the Royal Scottish Museum, Edinburgh; the other belongs to Mr. J. Smith, and is rather larger and better preserved: it has eight whorls in a length of 17 millimetres, while the greatest width=6 mm. The examples from Glencart, like the other gasteropoda from that locality, are very small.

Mr. Robert Dunlop possesses the best series that I have seen: it consists of ten specimens which are for the most part large, with the surface wonderfully well preserved, showing the sinual band, lines of growth, and ornamenting threads very distinctly. The latter are especially fine and numerous above the band, while those forming the band itself vary in number and strength. In one of the biggest examples (Pl. VI, fig. 14) an old lip-margin is preserved, with a deep sinus: it is evidently not the final outer lip of the adult, as there are impressions of lines of growth on the matrix showing that the sinus had been filled up, and that part of the shell-structure had subsequently perished. These specimens were found a quarter of a mile east of Strathavon, in the Lower Limestone Series.

Besides the small specimen previously mentioned from the Lower Limestone Series of Hairmyres, Mr. John Smith's collection contains two minute examples from Brodlie, Dalry, and two others, also small, from Dernshaw, Stewarton (Ayrshire), from the Upper Limestone Series. He has also two immature shells from Poolvash (Isle of Man).

The late Mr. J. G. Goodchild found an external mould in the Yoredale beds on Widdale Fell, Mosedale (Yorkshire).

In Belgium this species occurs at Tournai, as well as at Visé. I possess two specimens from the former locality purchased from M. Piret, and there are also two in the British Museum (Natural History). Prof. L. G. de Koninck merely noted its existence at Visé.

Altogether I have examined about sixty specimens of this species, only two of which, both from Craigenglen, have the protoconch preserved.

¹ Most of the specimens from this locality are in the Sedgwick Museum, and were collected by Mr. Burrow; they are merely labelled 'Carb. Lst., Settle,' and the exact locality is not recorded.

ACLISOIDES? *ARMSTRONGIANA* Donald.

Aclisoides striatula, var. *armstrongiana* Donald, 1898, Q. J. G. S. vol. liv, pars, p. 68 & pl. v, fig. 9 [exclude fig. 10].

Diagnosis.—Shell elongated, conical, composed of more than eight whorls. These are slightly angular a little below the middle, flat above, and convex below. The ornamentation consists of six threads on the lower two-thirds of the whorl, the three upper of which are the strongest and suggest a sinual band. Lines of growth unknown. Sutures deep. Aperture longer than wide; inner lip reflected on the body-whorl. Columella nearly straight. Base convex, slightly produced.

Remarks.—I formerly considered this a variety of *A. striatula* (De Koninck), but I now believe it to be a distinct species, and therefore give a fresh diagnosis. It is distinguished from *A. striatula* by its less convex contour, more angular whorls, and deeper sutures, as well as by the disposition, number, and relative strength of the ornamenting threads. I can only refer this species to *Aclisoides* with a query, as none of the specimens met with have the protoconch or lines of growth preserved. It is quite possible that the discovery of better examples may prove it to belong to *Aclisina*.

Holotype.—*Op. cit.* pl. v, fig. 9. Bennie Collection. Royal Scottish Museum, Edinburgh.

Dimensions.—Length=10 millimetres; width=3 mm.

Locality and horizon.—Law, Dalry, in the Lower Limestone Series. Besides the holotype there are two smaller specimens from this locality in the same collection, and Mr. J. Smith has two examples from Dykes, Kilbirnie, also from the Lower Limestone Series.

EXPLANATION OF PLATES V & VI.

PLATE V.

- Fig. 1. *Aclisina pulchra* De Koninck. Holotype, $\times 3$. Tournai. Brussels Museum. (See p. 68.)
- Figs. 2a & 2b. *Aclisina pulchra* De Koninck. Fig. 2a. Slightly flattened, $\times 3$. Fig. 2b. Portion of fifth whorl, $\times 12$. Tournai. Dorlodot Collection.
- 3a & 3b. *Aclisina venusta*, sp. nov. Fig. 3a $\times 5$. Fig. 3b Body-whorl, $\times 9$. Law, Dalry. Bennie Collection, Royal Scottish Museum, Edinburgh. (See p. 69.)
- Fig. 4. *Aclisina faber*, sp. nov. Back view, $\times 7.5$. (See p. 70.)
- Figs. 5a-5c. *Aclisina faber*, sp. nov., juv. Fig. 5a. Front view, $\times 22.5$. Figs. 5b & 5c. Different views of the protoconch, $\times 26$. High Smithston, Kilwinning. Collection of Mr. John Smith.
- 6a-6c. *Aclisina delicatula*, sp. nov. Fig. 6a. Back view, $\times 10$. Fig. 6b. Aperture, $\times 15$. Fig. 6c. Protoconch, $\times 26$. Longstaff Collection. (See p. 71.)
- 7a & 7b. *Aclisina micula*, sp. nov. Fig. 7a. Back view, $\times 15$. Fig. 7b. Protoconch, $\times 26$. High Smithston. Collection of Mr. John Smith. (See p. 71.)
- Fig. 8. *Aclisina similis* Donald. Protoconch, $\times 26$. High Smithston. Collection of Mr. John Smith. (See pp. 71-72.)

- Fig. 9. *Aclisina pusilla* Donald. Protoconch of the holotype, $\times 26$. Law, Dalry. Collection of Mr. John Smith. (See p. 72.)
10. *Aclisina elongata* (Fleming). Holotype, $\times 14$. Lauriston (Brankam Hall). Ure Collection, Royal Society, Edinburgh. (See p. 72.)
11. *Aclisina elongata* (Fleming). Front view of a remarkably well-preserved specimen, $\times 10$. Crawford Quarry, Beith. Young Collection, Kelvingrove Museum, Glasgow.
12. *Aclisina elongata* (Fleming). Side view of protoconch, $\times 26$. Dykes, Kilbirnie. Collection of Mr. John Smith.
- Figs. 13 a & 13 b. *Aclisina elongata*, var. *cingulata* Donald. Fig. 13 a $\times 10$. Fig. 13 b. Portion of whorl enlarged, $\times 15$. Glencart. Young Collection, Kelvingrove Museum, Glasgow. (See p. 73.)
- Fig. 14. *Aclisina elongata*, var. *cingulata* Donald. Front view of protoconch, $\times 26$. Dykes, Kilbirnie. Collection of Mr. J. Smith.
15. *Aclisina elongata*, var. *varians* Donald. Back view of protoconch, $\times 26$. Dykes, Kilbirnie. Collection of Mr. J. Smith. (See p. 73.)

PLATE VI.

- Fig. 1. *Aclisina subelongata*, sp. nov., $\times 10$. Moss Mullock, Kilwinning. Collection of Mr. J. Smith. (See p. 74.)
2. *Aclisina elegantula* Donald. Protoconch, $\times 27$. Law, Dalry. Bennie Collection, Royal Scottish Museum, Edinburgh. (See p. 74.)
3. *Aclisina striatissima* Donald. Front view, $\times 16$. Law, Dalry. Longstaff Collection. (See p. 75.)
4. *Aclisina striatissima* Donald. Protoconch of another specimen, $\times 26$. Law, Dalry. Longstaff Collection.
5. *Aclisina tenuistriata* Donald. Protoconch, $\times 26$. High Smithston. Collection of Mr. J. Smith. (See p. 76.)
6. *Aclisina aciculata* Donald. Front view, $\times 26$. Dykes, Kilbirnie. Collection of Mr. J. Smith. (See p. 77.)
7. ? *Aclisina multivolva*, sp. nov., $\times 10$. Moss Mullock. Collection of Mr. J. Smith. (See p. 77.)
8. ? *Aclisina multivolva*, sp. nov., $\times 10$. Glencart, Dalry. Young Collection, Kelvingrove Museum, Glasgow.
9. *Aclisina ashtonensis* (Bolton). Penultimate whorl of a specimen showing lines of growth, $\times 12$. Ashton Vale Colliery. Bolton Collection, Bristol Museum. (See p. 78.)
10. *Aclisoides striatula* (De Koninck), $\times 3$. Greatly contorted obliquely. Visé. One of the type specimens of *Murchisonia striatula* De Koninck, in the École des Mines, Paris. (See pp. 78–81.)
11. *Aclisoides striatula* (De Koninck). Back view of another type specimen, $\times 3$. Visé. École des Mines, Paris.
12. *Aclisoides striatula* (De Koninck). Holotype of *Aclisina striatula* De Koninck, $\times 5$. Visé. Musée d'Histoire Naturelle, Brussels.
13. *Aclisoides striatula* (De Koninck). Holotype of *Murchisonia subsulcata* De Koninck, $\times 3$. Flattened by pressure. Visé. École des Mines, Paris.
14. *Aclisoides striatula* (De Koninck), $\times 3$. Showing sinus in old lip-margin. Spiral angle greater than usual. Strathavon. Collection of Mr. R. Dunlop, Dunfermline.
15. *Aclisoides striatula* (De Koninck), $\times 10$. Small specimen with whorls more exsert than usual. Hairmyres. Collection of Mr. R. Dunlop.

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