

This impression seems to belong to the *Labyrinthodon*, but differs somewhat from those of the Bunter sandstone of Cheshire, appertaining probably to another species. I propose therefore to call it the *L. Lyelli*.

Another impression which seems to partake of a batrachian character is common at Green Mill; but the animal which has caused it having been apparently of small size, the steps are rather indistinct. In this case the same difference obtains between the impress of the fore and hind step as marks the foregoing form. In the hind footmark three toes usually occur, two of which are longer than the sole of the foot, and the other about the same length. Traces of two other toes are in some instances visible; but these are small, and occur one on the inner side and the other on the outer side of the impression. The whole length of the foot is commonly less than an inch, and its breadth about $\frac{5}{8}$ of an inch. About $\frac{1}{4}$ of an inch in front of the larger impression are seen the marks of the fore-feet, which are in the form of indents; but in some cases they present a foot-like marking resembling the fore-step of the *Labyrinthodon*. The length of the stride is about 3 inches, and the space between the impressions on the right and those on the left side is about 2 inches, distances somewhat similar to those in the preceding batrachian; and the form of the step is such as to show some analogy between these two forms. The characters are however not such as to lead to the conclusion that the impression belongs to the *Labyrinthodon*; and I propose to term this form of step *Batrachnis*, giving to this impression the name of *B. Stricklandi*, after Mr. Strickland, who has at different times noticed the ichnolites of Dumfries-shire.

XI.—*A Catalogue of British Spiders, including remarks on their Structure, Functions, Economy and Systematic Arrangement.*
By JOHN BLACKWALL, F.L.S.

[Continued from p. 44.]

62. *Clubiona lapidicolens*.

Clubiona lapidicolens, Walck. Hist. Nat. des Insect. Apt. t. i. p. 598.
— *lapidicola*, Latr. Gen. Crust. et Insect. tom. i. p. 91; Sund.
Vet. Acad. Handl. 1831, p. 139; Hahn, Die Arachn. B. ii. p. 9.
tab. 40. fig. 100.

The claim of *Clubiona lapidicolens* to a place among British spiders rests on the authority of Dr. Leach. See the Supplement to the 4th, 5th and 6th editions of the 'Encyclopædia Britannica,' article Annulosa.

63. *Clubiona accentuata*.

Clubiona accentuata, Walck. Hist. Nat. des Insect. Apt. t. i. p. 594; Sund. Vet. Acad. Handl. 1832, p. 268; Blackw. Linn. Trans. vol. xix. p. 115.

— *punctata*, Hahn, Die Arachn. B. ii. p. 8. tab. 39. fig. 99.

Agelena obscura, Sund. Vet. Acad. Handl. 1831, p. 128.

Anyphæna accentuata, Sund. Consp. Arachn. p. 20, 21; Koch, Uebers. des Arachn. Syst. erstes Heft, p. 18.

This active spider is of frequent occurrence in the woods of North Wales, running with great rapidity among the foliage of the trees, and sometimes concealing itself under the lichens which grow upon their trunks and branches. In June the female deposits about 157 spherical eggs of a pale yellowish white colour, not agglutinated together, in a lenticular cocoon of white silk of a very fine texture, measuring $\frac{7}{16}$ ths of an inch in diameter; it is inclosed in a sac of the same material, attached to the inferior surface of a leaf, the sides of which are curved downwards and are held in that position by silken lines connecting them with the sac. The female generally places herself on or near the cocoon, but speedily abandons it on being disturbed.

64. *Clubiona nutrix*.

Clubiona nutrix, Walck. Hist. Nat. des Insect. Apt. t. i. p. 601; Latr. Gen. Crust. et Insect. tom. i. p. 92; Hahn, Die Arachn. B. ii. p. 7. tab. 39. fig. 98.

Drassus maxillosus, Wider, Mus. Senck. B. i. p. 209. taf. 14. fig. 8.

Anyphæna nutrix, Koch, Uebers. des Arachn. Syst. erstes Heft, p. 18.

Chieracanthium nutrix, Koch, Die Arachn. B. vi. p. 9. tab. 182. fig. 434, 435.

According to Dr. Leach this spider has been taken once in England, near Cheltenham. See the Supplement to the 4th, 5th and 6th editions of the 'Encyclopædia Britannica,' article Annulosa.

65. *Clubiona erratica*.

Clubiona erratica, Walck. Hist. Nat. des Insect. Apt. t. i. p. 602; Blackw. Linn. Trans. vol. xix. p. 115.

Chieracanthium carnifex, Koch, Die Arachn. B. vi. p. 14. tab. 184. fig. 438, 439.

Specimens of this handsome species have frequently come under my observation when exploring the woods and commons of Denbighshire. In July the female constructs a cell of white silk of a compact texture among the stems of gorse, heath, or the leaves of plants, which she curves about it and secures in that position by means of silken lines. In this cell she deposits about 140 eggs of a deep yellow colour, not agglutinated together; they are

contained in an exceedingly delicate tissue of white silk of a sub-globose form, measuring $\frac{1}{4}$ th of an inch in diameter, which is attached to the surface of the cell. The female, after the deposition of her eggs, does not appear to quit the cell even for the purpose of procuring food.

A collection of spiders made by the Rev. Hamlet Clark in the autumn of 1842, at Wappenham, in Northamptonshire, and obligingly placed by him at my disposal, comprised specimens of this species.

Genus ARGYRONETA, Latr.

66. *Argyroneta aquatica*.

Argyroneta aquatica, Latr. Gen. Crust. et Insect. tom. i. p. 94; Walck. Hist. Nat. des Insect. Apt. t. ii. p. 378. pl. 22. fig. 4; Sund. Vet. Acad. Handl. 1831, p. 131; Hahn, Die Arachn. B. ii. p. 33. tab. 49. fig. 118; Koch, Uebers. des Arachn. Syst. erstes Heft, p. 14; Die Arachn. B. viii. p. 60. tab. 269. fig. 636; Blackw. Linn. Trans. vol. xix. p. 116.

Argyroneta aquatica habitually passes the greater part of its life in the water, not only pursuing its prey in that liquid, but constructing beneath its surface a dome-shaped cell in which it places the cocoon containing its eggs; this cell is supported in a vertical position, the open part being directed downwards, by lines of silk connecting it with aquatic plants, and, as it comprises a considerable quantity of atmospheric air, the spider can at all times occupy it without experiencing the least inconvenience. In swimming and diving, the body of *Argyroneta aquatica* is more or less enveloped in air confined by the circumambient water among the hairs with which it is clothed, the supply being always more abundant on the under than on the upper part in consequence of the greater length and density of the hairs distributed over its surface.

This species is found in pools and ditches in various parts of England. It is of frequent occurrence in the fens of Cambridge-shire, from which locality I transported a pair to Crumpsall Hall, near Manchester, in the summer of 1833; each was inclosed in a small tin box, and did not appear to suffer materially from the confinement. After the lapse of ten days, during which period they were without water, I conveyed them to Oakland, in Den-bighshire, where they arrived in perfect health. On placing one of them in a large goblet more than half filled with water, it speedily formed a dome-shaped cell beneath the surface, attaching it to the side of the glass by means of numerous silken lines; being well supplied with insects, it lived in this state of captivity till the commencement of winter, and on the temperature of the room in which it was kept becoming much reduced, it entered

the cell and remained there in a state of torpidity, with its head downwards. A gentleman on a visit at the house, whose curiosity to examine the spider minutely in its hybernaculum was greater than his prudence, inclined the glass so much that the air escaped from the cell, the water flowed in, and before I was informed of the occurrence the dormant inmate had perished.

The aquatic habits of this species have induced M. Walckenaer to constitute with it a distinct family; but upon the same principle *Lycosa piratica* and *Dolomedes fimbriatus* might be separated from the *Lycosidæ*, as they descend spontaneously into water and perform the function of respiration in that situation precisely in the same manner as *Argyroneta aquatica* does; yet the position, which in conformity with their organization they so consistently occupy in the systematic arrangement of the *Araneidea*, has not been disturbed. Influenced by these considerations, and guided by the relations of affinity predominant in the structure of *Argyroneta aquatica*, I have included it among the *Drassidæ*.

Family *Ciniflonidæ*.

Genus CINIFLO, Blackw.

67. *Ciniflo atrox*.

Ciniflo atrox, Blackw. Linn. Trans. vol. xviii. p. 607.

Clubiona atrox, Walck. Hist. Nat. des Insect. Apt. t. i. p. 605; Latr.

Gen. Crust. et Insect. tom. i. p. 93; Sund. Vet. Acad. Handl. 1831, p. 144; Hahn, Die Arachn. B. i. p. 115. tab. 30. fig. 87.

Amaurobius atrox, Koch, Uebers. des Arachn. Syst. erstes Heft, p. 15;

Die Arachn. B. x. p. 116. tab. 355. fig. 831.

Titulus 21, Lister, Hist. Animal. Angl. De Aran. p. 68. tab. 1. fig. 21.

Remarkable differences in structure, functions and economy effectually serve to distinguish the spiders belonging to the genus *Ciniflo* from those of the genera *Clubiona* and *Amaurobius* with which they have been associated by arachnologists; all have *eight* spinners, and have the metatarsus of each posterior leg provided with a *calamistrum*, consisting of two parallel rows of spines, which is employed in the fabrication of their extensive and curiously constructed webs; they are also sedentary in their habits, most frequently occupying crevices in rocks, walls, or the bark of old trees, between which and their snares a communication is effected through the medium of one or more slight silken tubes. Though the importance of these characters is admitted by M. Walckenaer, yet he still retains the species of *Ciniflo* among the *Clubionæ* (Hist. Nat. des Insect. Apt. t. iv. pp. 444, 445).

The female of this common spider in the month of June deposits about 70 spherical eggs of a pale yellow colour, not ag-

glutinated together, in a cocoon of white silk of a loose texture, measuring $\frac{7}{8}$ ths of an inch in diameter; it is nearly of a plano-convex figure, and is connected with the interior surface of an oval cell of white curled silk, on the outside of which bits of soil and other extraneous materials are distributed. This cell is generally constructed in or near the spider's retreat.

On the 14th September 1842 I captured an adult female of this species in which the left intermediate eye of the posterior row was entirely wanting.

68. *Ciniflo ferox*.

Ciniflo ferox, Blackw. Linn. Trans. vol. xix. p. 116.

Clubiona ferox, Walck. Hist. Nat. des Insect. Apt. t. i. p. 606.

Amaurobius ferox, Koch, Die Arachn. B. vi. p. 41. t. 191. f. 460, 461.

Notwithstanding the superior size of this spider, it is very commonly confounded with *Ciniflo atrox*, which it closely resembles in form, colour and œconomy; both species are found in the same localities, and are abundantly distributed throughout the kingdom.

Genus *ERGATIS*, Blackw.

69. *Ergatis benigna*.

Ergatis benigna, Blackw. Linn. Trans. vol. xviii. p. 608.

Theridion benignum, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 337; Sund. Vet. Acad. Handl. 1831, p. 122.

Dictyna benigna, Sund. Consp. Arachn. p. 16; Koch, Die Arachn. B. iii. p. 27. tab. 83. fig. 184, 185; Uebers. des Arachn. Syst. erstes Heft, p. 12.

Clubiona parvula, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. iii. p. 437.

Drassus parvulus, Blackw. Research. in Zool. p. 337.

Titulus 15, Lister, Hist. Animal. Angl. De Aran. p. 55.

The various places which arachnologists have assigned to the spiders constituting the genus *Ergatis*, in their attempts to arrange the *Araneidea* in accordance with the natural relations of affinity and analogy, afford a sufficient indication that the task of determining their true position, before the discovery of those marked characters which serve to connect them with the *Ciniflonidæ*, was attended by no ordinary difficulties. M. Walckenaer, in his 'Hist. Nat. des Insect. Apt.' t. iv. p. 500, has formed with the species belonging to the genus *Ergatis*, previously included by him in the genera *Drassus* and *Theridion*, a small group which he has placed at the head of his genus *Argus*; but so closely are they allied to the *Ciniflones* by their structure and functions, being provided with *eight* spinners and *calamistra* employed in the construction of their snares, that they cannot be removed

from the family *Ciniflonidæ*, which I have founded upon those characters, without doing violence to the recognised principles of classification.

Ergatis benigna fabricates an irregular web of whitish silk at the extremity of the twigs of heath and gorse growing in various parts of England and Wales. It pairs in May, and in that and the succeeding month the female constructs two or three contiguous, lenticular, white cocoons of a compact texture, measuring about $\frac{1}{7}$ th of an inch in diameter, on an average, which she attaches to the stems surrounded by her web, enveloping them with the refuse of her prey. Each cocoon contains from 10 to 30 spherical eggs of a pale yellow colour, which do not adhere together.

70. *Ergatis latens*.

Ergatis latens, Blackw. Linn. Trans. vol. xviii. p. 608; vol. xix. p. 117.

Dictyna latens, Koch, Die Arachn. B. iii. p. 29. tab. 83. fig. 186.

Theridion latens, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 340.

Titulus 16, Lister, Hist. Animal. Angl. De Aran. p. 56. tab. 1. fig. 16.

This species is found in the same localities as *Ergatis benigna*, which it resembles in habits and economy. The sexes pair in June, and in the following month the female constructs several contiguous lenticular cocoons of greenish white silk of a compact texture, measuring about $\frac{1}{8}$ th of an inch in diameter, on an average; these she attaches to a stem of gorse or heath surrounded by her web, distributing about them the refuse of her prey; each contains from 10 to 16 spherical eggs of a yellow colour, which are not adherent among themselves.

The statement of M. Walckenaer that this spider has the fourth pair of legs longer than the second (Hist. Nat. des Insect. Apt. t. iv. p. 501) requires correction, as the relative length of its organs of locomotion does not differ from that of its congener *Ergatis benigna*.

Family *Agelenidæ*.

Genus *AGELENA*, Walck.

71. *Agelena labyrinthica*.

Agelena labyrinthica, Walck. Hist. Nat. des Insect. Apt. t. ii. p. 20; Sund. Vet. Acad. Handl. 1831, p. 129; Hahn, Die Arachn. B. ii. p. 61. tab. 65. fig. 150, 151; Koch, Uebers. des Arachn. Syst. erstes Heft, p. 14.

Aranea labyrinthica, Latr. Gen. Crust. et Insect. tom. i. p. 95.

Titulus 18, Lister, Hist. Animal. Angl. De Aran. p. 60. t. 1. fig. 18.

In localities suited to its habits, this active spider is frequently very numerous, constructing among gorse, heath, and coarse herbage an extensive horizontal sheet of web, having a cylin-

drical tube connected with it which constitutes the abode of its possessor. The web is attached to surrounding objects by its margin, and derives additional support from fine lines, intersecting one another at various angles, whose extremities are in contact with its surface, and with such objects as are situated at a moderate elevation above it. The sexes pair in July, and in August the female fabricates a large sac of compact white silk, which comprises one or two lenticular cocoons composed of white silk of a fine texture, measuring about $\frac{7}{16}$ ths of an inch in diameter, on an average. Each cocoon, according to its size, contains from 50 to 120 large spherical eggs of a pale yellow colour, not agglutinated together, and is enveloped in a lenticular covering of strong white silk, which is made secure to the inner surface of the sac by silken lines closely compacted in the form of short strong pillars, evidently alluded to by Lister in the following passage: "*ipse autem folliculus stellæ in modum formatus est*" (De Araneis, p. 62). The sac is firmly attached to stems of gorse, heath, or long grass, and has usually withered leaves, particles of soil, and other materials of various kinds distributed over its surface.

In the 'Report of the Third Meeting of the British Association for the Advancement of Science, held at Cambridge in 1833,' p. 445, I have shown that the superior spinners of *Agelena labyrinthica* and some other spiders have the spinning-tubes disposed along the inferior surface of the elongated terminal joint, and, consequently, that the opinion previously entertained, that the function exercised by these organs is simply that of touch, and that they are employed solely in regulating the application of the spinners to appropriate objects, is decidedly erroneous.

72. *Agelena elegans*.

Agelena elegans, Blackw. Linn. Trans. vol. xviii. p. 619; Walck. Hist. Nat. des Insect. Apt. t. iv. p. 463.

Hahnia pratensis, Koch, Die Arachn. B. viii. p. 64. t. 270. fig. 639.

Though M. Walckenaer has placed this species in the genus *Tegenaria*, yet he has omitted to change its generic name (Hist. Nat. des Insect. Apt. t. iv. p. 463); and, not perceiving that it is identical with the *Hahnia pratensis* of M. Koch, has also proposed to transfer it, together with the *Hahnia pusilla* (*Agelena montana*, Blackw.) of the latter naturalist, to the genus *Argus* (Hist. Nat. des Insect. Apt. t. iv. pp. 465, 466, 503); but, as the generic characters of both these spiders and those of the *Agelenæ* appear to coincide, I can neither adopt the proposition of M. Walckenaer nor the genus *Hahnia* of M. Koch.

Agelena elegans occurs in moist pastures near Llanrwst, and the males have the palpal organs fully developed in August.

73. *Agelena prompta*.

Agelena prompta, Blackw. Linn. Trans. vol. xviii. p. 621.

Agelena prompta is included by M. Walckenaer among the synonyma of *Tegenaria emaciata* (Hist. Nat. des Insect. Apt. t. iv. p. 462), from which species it differs in size, organization and colour. It conceals itself under stones in woods about Llanrwst, and the male has the palpal organs completely developed in October.

74. *Agelena montana*.

Agelena montana, Blackw. Linn. Trans. vol. xviii. p. 622.

Hahnia pusilla, Koch, Die Arachn. B. viii. p. 61. t. 270. f. 637, 638.

Argus montanus, Walck. Hist. Nat. des Insect. Apt. t. iv. p. 505.

In transferring this spider to the genus *Argus*, with which it has no relation of affinity, M. Walckenaer has not perceived that it is specifically identical with the *Hahnia pusilla* of M. Koch.

Females of this species were discovered in February 1837 under stones, on Gallt y Rhyg, a mountain in Denbighshire, near Llanrwst.

75. *Agelena nava*.

Agelena nava, Blackw. Linn. Trans. vol. xviii. p. 623.

Argus narus, Walck. Hist. Nat. des Insect. Apt. t. iv. p. 506.

About midsummer, this species, which, notwithstanding its close connexion with the *Agelenæ*, M. Walckenaer has placed in the genus *Argus* (see the synonyma), may be seen in considerable numbers running on the ground, and on rails and gates in pastures near Llanrwst. The palpal organs of the male are fully developed in May.

76. *Agelena brunnea*.

Agelena brunnea, Blackw. Lond. and Edinb. Phil. Mag. Third Series, vol. iii. p. 351; Research. in Zool. p. 351.

Agelena brunnea is of rare occurrence in woods in the valley of the Conway. The sexes pair in May, and in the same month the female constructs an elegant vase-shaped cocoon of white silk of a fine compact texture, attached by a short foot-stalk to rushes, the stems of grass, heath, or gorse; it measures about $\frac{1}{4}$ th of an inch in diameter, and contains from 40 to 50 yellowish white spherical eggs enveloped in white silk connected with the interior surface of the cocoon contiguous to the foot-stalk. Greatly to the disadvantage of its appearance, the entire cocoon is smeared with moist soil, which drying serves to protect it from the weather, and, as an additional security, the extremity is closed and directed downwards.



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