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V.—Remarks on the British Geodephaga; with notes on some Scydmænidæ and Pselaphidæ

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the nutriment and the formation of large quantities of starch and highly carbonized resinous matters in plants devoid of leaves or other green parts. Of this I can offer no explanation without going into hypotheses regarding assimilation in general, which I am not willing to do here; I will only observe, that I believe assimilation to be a process wholly distinct and independent of the respiration, liberating oxygen, in the green parts of plants.

The specimens in which I traced the connection of the parasite with the root of the foster-plant were *single* and small; in other cases I found a group of two or three large specimens attached together and to a decayed tuber, probably of the former year, and having no apparent connection with a foster-plant. This point requires further observation; but these cases suggest that the *seedling* plant may require a foster-plant, while those produced by buds from an old plant are less dependent; just as the green parasites in the *Rhinanthaceæ* are apparently independent after they have acquired a certain degree of development.

The development of the ovary confirms Mr. Brown's view of its structure, in opposition to the opinion expressed by Dr. Lindley. I have satisfied myself, by tracing the formation from the earliest stages, that the carpels stand fore and aft, and not laterally. A section of the perfect style also, just below the stigma, exhibits two vascular bundles, one in front and one behind, opposite the sutures of dehiscence, so that the lobes of the stigma each belong half to each carpel. The supposed analogy with *Gentianaceæ* therefore falls to the ground, while that with *Scrophulariaceæ* is real.

V.—*Remarks on the British Geodephaga; with Notes on some Scydmaenidæ and Pselaphidæ.* By DR. H. SCHAUM*.

No attempt to reconcile, even in a tolerably satisfactory manner, the great difference which exists between the usual English nomenclature and our own, has hitherto been successful. Of the more numerous and difficult genera of insects, an understanding can scarcely be obtained without interchanging specimens or studying the original collections. The descriptions of the English writers, which perhaps may suffice to make known to the

* Translated by Wm. S. Dallas, Esq., from the 'Entomologische Zeitung' for February 1848, pp. 34-44, and communicated by him.

[These introductory remarks of Dr. Schaum apply only to Coleoptera, for Mr. Henry Doubleday and Mr. Stainton have done much to rectify the nomenclature of the nocturnal smaller Lepidoptera, while Messrs. Shuckard, F. Smith, Haliday, Walker and others have laboured, and by foreign works have determined the species of many groups of Hymenoptera and Diptera.]

native collectors the comparatively few species of the scanty British fauna, are not sufficient for the entomologists of the continent, who have a richer field before them. Recognition from descriptions, besides, becomes still more difficult, because insects which are represented by English writers under names given by Gyllenhal, Dejean, or other authors, are frequently incorrectly determined, and consequently cannot serve as starting-points for the settlement of the other species. An interchange of specimens has not yet been successfully introduced, for most of the English collectors, induced by the insular position of Great Britain, confine themselves entirely to the investigation of their own fauna, and usually feel no interest whatever in continental insects.

A two months' residence in London gave me the opportunity of seeing the collection of Mr. J. F. Stephens frequently, and as the most liberal permission to make use of it was granted to me by the kind owner, I resolved to investigate thoroughly some families contained in it, considering this more advantageous than collecting notes on individual species of different families. I chose *Carabici* and *Hydrocanthari*, with which I am most conversant, and in which I promised myself most success. I should willingly have investigated some other groups, such as the *Elaters* and a part of the *Palpicornes*; but my stay in London was too short, and my time too much occupied to admit of this; and besides, I dreaded making erroneous statements in many cases, from the impossibility of now and then comparing correctly determined specimens of German species.

It is to be wished that English entomologists, following Walton's example, would set themselves to the task (and attend to it closely) of studying individual families, so as to bring about in them an agreement between the English nomenclature and that employed on the continent. Walton's laborious works on the British Curculionidæ are published in Taylor's 'Annals of Natural History,' and I hope the 'Entomologische Zeitung' may soon give us translations of his last essays.

I will now go through the genera of *Carabici* in their order.

Cicindela sylvicola.—The specimen figured by Curtis, which is in the collection of Mr. J. F. Stephens, is a green variety of *C. hybrida*, Dej. The true *C. sylvicola*, Dej., is not indigenous in England.

Dromius fenestratus, Ste., is not *fenestratus*, Fab., Dej., but a variety of *D. testaceus*, Erichs., with a yellow spot on the anterior half of the elytra*. The type of the latter species is mixed with *D. agilis* in Stephens's collection under the names of *D. agilis* and *meridionalis*.

D. bipennifer is *Sigma*, Rossi, Dej.; *D. impunctatus* belongs to

* This variety is described by Dejean, i. p. 242, as *D. agilis*, var. *a*.
Ann. & Mag. N. Hist. Ser. 2. Vol. iii.

D. obscuroguttatus, Duft., *spilotus*, Dej. *D. angustatus* and *maurus* are not distinct, and both = *D. maurus*, St.

Lamprius (*Lebia*) *nigritarsis* does not appear to me to differ from *L. cyanocephala*, nor *L. rufipes* from *L. chlorocephala*.

Tarus humeralis is Dejean's *Cymindis* of the same name. *T. macularis* and *axillaris* are mutually identical, and perhaps only a variety of *C. humeralis* with a dark red prothorax; at all events quite distinct both from *C. macularis*, Dej., and *C. axillaris*, Dej. *T. coadunatus*, *levigatus*, *homagricus* and *angularis* again form one species, which is identical with *C. homagricus*, Dej. *T. basalis* is the Gyllenhalian species of the same name. It appears consequently that there are three species of *Cymindis* indigenous to England—*C. humeralis*, *homagricus* and *basalis*.

Brachinus crepitans.—To this species, the specimens named in Stephens's collection *B. immaculicornis*, *explodens* and *glabratus* appeared to me to belong.

Almost the whole of the English species of the genus *Dyschirius* are known on the continent under other names; only *D. nitidus*, *politus*, *aneus* and *gibbus* of Stephens are, the first probably, and the three others certainly, the like-named species of Dejean and Putzeys. Of the others, *D. minimus* is the same as *D. gibbus*; *D. pusillus*, *ovatus* and *thoracicus* are not distinct from *D. aneus*; *D. tristis* is a specimen of the same species inclining, in colour, to blue; *D. rufipes* and *punctatus* are the same as *D. salinus*, Schaum, Putz.; *D. arenosus* is an immature specimen of the true *D. thoracicus*, Fab., Er., Putz.*; *D. cylindricus* the same as *D. politus*, and *D. inermis*, *digitatus* and *fulvipes* form one species, and are identical with *D. arenosus*, Putz. (non Steph.). Putzeys has been misled, by an incorrectly determined specimen in Hope's collection, into describing this marked species (which I found in plenty on the sea-shore near Swinemünde in the summer of 1845) as *D. arenosus*, Ste. The name *D. inermis*, under which Curtis has so beautifully figured it, will be retained for this species.

The English specimens of *Nebria livida* all belong to *N. lateralis*, Fab.: the true *N. livida* is not indigenous in England.

Helobia (*Nebria*) *lata*, Newm., is, according to the original specimens, only a rather large variety of *H. brevicollis*, and *H. varicornis*, Newm., is described from immature specimens of the same species. *H. æthiops*, Ste., is a large specimen of *Gyllenhalii*, Schönh., of which *H. Marshallana*, Ste. (*arctica*, Dej.) is an alpine form.

Leistus nigricans, Newm.—The original is an old, dark specimen of *L. spinibarbis*. *L. Janus*, Newm., is described from immature specimens of *L. fulvibarbis*, Dej. *Leistus montanus*, Ste., is a very marked species of this genus, apparently unknown on the continent. *L. indentatus*, Newm., is unknown to me, as I have not seen the original specimen; it is most probably not a distinct species, and the depression described merely accidental.

* This was the only specimen of this species (*D. thoracicus*, Fab.) in Stephens's collection; it is not rare in England however, and has been taken by Wollaston in great plenty.

Trimorphus scapularis and *confinis*, Ste., are the same as *Badister humeralis*, Bon. ; *T. erro*, Newm., is identical with *B. peltatus*, Ill.

Badister suturalis.—The specimen originally described and figured by Stephens is a pretty variety of *B. unipustulatus*, Bon., *cephalotes*, Dej. The specimens which Stephens subsequently received and mentioned in the 'Supplement to his Illustrations' are of a similar variety of *B. bipustulatus*. To the latter species *B. microcephalus*, Ste., also belongs.

Epomis circumscriptus, Duft., is not indigenous in England ; in Stephens's collection I found under this name two different *Chlænii* from the Cape.

Chlænus fulgidus, Ste., is an immature specimen of *C. melano-cornis*, which has shrivelled in drying ; *C. xanthopus*, Ste., is a North American species allied to *C. cobaltinus*.

Agonum austriacum is *modestum*, Dej. ; *A. fulgens*, Ste., is identical with *A. Ericeti*, Panz., Sturm ; *A. plicicolle* is a deformed specimen of *A. viduum* ; *A. viduum*, Erichson's species of the same name. *A. versutum*, *lave*, *emarginatum*, *mæstum*, *lugubre* and *afrum* all appeared to me to belong to *A. mæstum*, Erich. *A. Bogemanni* I have not seen, the species not being in Stephens's collection.

A. quadripunctatum differs entirely from *quadripunctatum*, DeGeer, and appeared to me to be *A. fuliginosum*, Knoch ; *A. consimile* I look upon as *A. scitulum*, Dej., and *A. atratum*, Ste., as *gracile*, Sturm, Dej. ; *A. piceum*, *Simpsoni*, *pullum*, *striatum* and *fuliginosum* are all to be united as *A. fuliginosum*, Knoch ; *A. micans* and *cursor* correspond with *A. micans*, Nicolai, Er., *pelidnum*, Duft., Dej. ; *A. picipes* is the species so called by Dejean and Erichson. *A. fuscipenne* and *gracile* belong again to *fuliginosum* ; *A. pelidnum* is *Thoreyi*, Dej., a species not rare in England ; *A. affine* is the true *A. pelidnum*, Payk., Gyll., Er., *puellum*, Dej. ; *A. pusillum* is a single minute specimen, and therefore difficult to determine ; perhaps it is also to be united to *A. fuliginosum* ; *A. vivens* is the Gyllenhalian insect of the same name.

Odontonyx rotundicollis, Marsh., is the same as *Olisthopus rotundatus*, Payk.

Calathus apicalis, Newm., is described after an immature specimen of *C. melanocephalus* : *C. crocopus* and *fuscus* are to be united with *C. flavipes*, Payk., Sturm ; *C. rufangulus* is the genuine *C. fuscus*, Fab., Dej., Er. ; *C. mollis* is *ochropterus*, Duft., a plentiful species at Liverpool, under stones near the sea ; *C. nubigena*, Haliday, is a distinct species which has been discovered in Ireland.

Platyderus ruficollis is *Feronia (Pterost.) depressa*, Dej.

Argutor inquinatus is a large variety of *F. vernalis*, Dej. ; *A. rufomarginatus* and *vernalis* are specimens of the same species of ordinary size ; *A. inæqualis*, *Scalesii* and *longicollis* are varieties of *A. longicollis*, Duft., Sturm, *ochraceus*, Sturm, *negligens*, Dej. ; *A. diligens* is *A. strenuus*, Ill., Panz., *pullus*, Gyll., Dej. ; *A. interstinctus*, *erythropus*, *strenuus* and *pullus* all belong to *A. pygmaeus*, Sturm, Er., *strenuus*, Dej. ; *A. anthracinus* is *Feronia minor*, Dej.

Pogonus Burrellii is *P. luridipennis*, Germ. ; *P. chaldeus* and *litto-*

ralis correspond with *halophilus*, Germ., Dej.; *P. æruginosus*, Ste., is the genuine *P. littoralis*, Duft., Sturm.

Onaseus Orinomum is not to be divided from *O. Bulwerii*; the species is not known to me under any other name; *A. lævigatus*, Ste. is *F. minor*, Dej., again; *O. ruffemoratus* is a variety of *O. nigrita* with red thighs; *O. tetricus*, Haliday, and *O. rotundicollis*, Ste., are *F. gracilis*, Dej.; *O. affinis* is a monstrous specimen of *O. melanarius*; *Feronia picea* is *picimana*, Duft., Dej.

Amara acuminata, *obsoleta*, *similata*, *trivialis*, *vulgaris*, *spretta*, *familiaris*, *communis* and *tibialis*, Ste., are the Erichsonian species of the same names; *A. ovata* belongs to *A. obsoleta*, as do also *A. ingenua* and *subænea* of the Stephensian collection, but the descriptions of the two last in Stephens's 'Manual' are repetitions of those given by Erichson under those names. Stephens's descriptions of *A. municipalis*, *brunnea*, *curta* and *patricia* are also borrowed from Erichson, the genuine species of these names not existing in his collection. The specimen there marked as *A. curta* is a dark *A. spretta*; the original specimen of the *A. discrepans*, Marsh., referred by Stephens to *A. brunnea*, is an *A. bifrons*; the Stephensian descriptions of *A. municipalis* and *patricia* are not founded on specimens. The other species of the genus answer to ours as follows, viz.: *A. nitida*, Ste., is the true *A. plebeja*, Gyll., *A. lævis* and *lucida* belong to *A. familiaris*, *A. convexior*, *plebeja*, *obtusa* and *atrocærulea* to *A. communis*, Gyll., and *A. erythroa* and *infima* to *A. gemina*, Er.; *A. atra* is a black variety of *A. trivialis*, *A. laticollis* probably the true *A. nitida*, Sturm, Er., and *A. tricuspidata* is a species unknown to me, distinct from *A. tricuspidata*, Dej., perhaps *A. depressa*, Er.

Bradytus crassus is identical with *A. consularis*, *B. marginatus* the same as *A. patricia*, *B. torridus* an immature female of *A. apricaria*, and *B. fulvus* and *ferrugineus* are mutually identical.

Harpalus serripes, *tardus* and *stygius* belong to *H. serripes*, as do also *H. fuscipalpis* and *tenebrosus*, whilst *H. rufimanus*, *fuliginosus* and *latus* constitute the true *H. tardus*, Ill., Dej.; *H. nigripes*, *piger*, *anxius*, *femoralis*, *complanatus*, *flaviventris* and *luteicornis* are all only slight varieties of *H. anxius*; *H. luteicornis* for example being a small female, and *H. complanatus* and *flaviventris* immature specimens. *H. thoracicus*, *depressus* and *melampus* are the same as *H. semiviolaceus*, Dej.; *H. Petisii*, *rubripes*, *azureus*, *chloropterus*, *marginellus*, *fulvipes* and *lentus* are varieties, sexual or otherwise, of *H. rubripes*; *H. caffer* is the true *H. perplexus*, Gyll., Dej.; *H. rufitarsis* a small, and *H. calceatus* a large specimen of *Anisodactylus binotatus*. Upon the other *Harpali* I cannot venture to pronounce any opinion; they are mostly species which are rare in the north-east of Germany and are less known to me.

Pangus scaritides, a single female, which has nothing in common with *Selenophorus scaritides*, and appeared to me scarcely distinct from *Actephilus pumilus*, Ste.

Actephilus vernalis is *H. picipennis*, Dej.; *A. pumilus* is not known to me with certainty.

Ophonus stictus appeared to me to belong to *H. monticola*, Dej.

(the genuine *Carabus obscurus*, Fab.); *O. punctatulus* and *nitidulus* are mutually identical, and the same as *H. punctatulus*, Dej.; *O. punctatissimus* may perhaps be *subcordatus*, Dej.; *O. foraminulosus* appeared to me to belong to *puncticollis*, Payk., Dej., and *O. puncticeps* to be a small variety of the same species, whilst *O. puncticollis*, *subpunctatus* and *cribellum* might answer for the *H. brevicollis*, Dej. I will not however give out these statements as absolutely certain.

Stenolophus Skrimshiranus might perhaps correspond with the *S. melanocephalus*, Findel, which is described by Dejean as a variety of *S. vaporariorum*, but I am not convinced that it is so.

Most of the specimens of *Trechus dorsalis* in the Stephensian collection belonged to *Stenol. elegans*, Dej.; *T. echus parvulus* is an immature *St. dorsalis*, Dej.; *T. flavicollis* is *Acup. luridus*, Dej., but not *T. flavicollis*, Sturm; *T. nitidus* is identical with the preceding; *T. ruficollis* is *Bradycellus similis*, Er., and *T. placidus* the *Bradycellus placidus*, Er.; *T. suturalis* is *Acup. cognatus*, Gyll., Dej. The specimens with a reddish thorax which are mentioned in Stephens's descriptions belong to *placidus*, Gyll.; I cannot distinguish *T. fulvus* from *Acup. Harpalinus*, Dej.; *T. pallidus* is founded on immature specimens of the same species.

T. brunnipes is a species of *Bradycellus* not otherwise known to me, nearly allied to *B. Harpalinus*, and distinct from *Stenol. brunripes*, Sturm, Er.; *T. consputus* and *meridianus* are the species so called by Erichson; *T. cognatus* is nothing but a specimen of *T. meridianus*; *T. aquaticus*, with its varieties *T. fuscipennis* and *tristis*, is identical with *T. minutus*, Er., and *T. laevis* is a large specimen of the same species.

Blemus paludosus is Dejean's *Trechus* of the same name; *B. pallidus* answers exactly to the description of *Trechus fulvus*, Dej., but does not agree with *T. pallidus*, Sturm. Of the true *B. longicornis*, Sturm, I have seen no English specimen.

Lymnaem nigropiceum is a very marked species, which was previously quite unknown to me.

Tachys scutellaris is the same as *Bemb. scutellare*, Dej.; *T. binotatus* and *vittatus* the same as *B. guttula*, Dej., Er.; *T. inermis*, *pussillus*, *obtusus* and *gracilis* belong to *B. obtusum*, Sturm, Dej.; *T. minutissimus* and perhaps also *T. minimus*, Curt., which I have not seen, are identical with *B. bistriatum*, Dej.; *T. maritimus* is not in Stephens's collection.

Philochthus æneus is *Bemb. æneum*, Germ.; *P. Doris*, *subfenestratus* and *biguttatus* appeared to me to belong to *B. vulneratum*, Dej.; and *P. guttula* to *B. biguttatum*. The typical specimen of *B. hæmorrhoum*, Kirby, is a *B. guttula*, Dej. Specimens of *B. obtusum* have been confounded with it by Stephens.

Ocys currens is *Bemb. pumilio*, Dej.; *O. melanocephalus* and *tempestivus* are the same as *B. rufescens*, Dej.

Peryphus femoratus and *concinuus* appeared to me to belong to *Bemb. Bruxellense*, Putz., and the second is certainly different from *B. concinuum* of Putzeys. Under *P. maritimus* several species are confounded; of the four specimens in the Stephensian cabinet, two

belong to the preceding species, one to *B. concinnum* of Putzeys, and the fourth to *B. rupestre*, Dej.; *B. tetraspilotus* is wanting in Stephens's collection. Two specimens which Wollaston communicated to me under this name belonged to *B. rupestre*, Dej.; *P. littoralis* is *B. rupestre*, Dej.; *P. lunatus* and *ustus* are *B. lunatum*, Duft., *P. lunatus* being established on immature and *P. ustus* on mature specimens of that insect; *P. decorus* and *albipes* correspond with *P. brunripes*, Dej., *P. albipes* being the young specimens; *P. nitidulus*, Marsh., is *P. rufipes*, Dej., and *P. agilis* the same as *B. decorum*, Dej. On the other species of the genus *Peryphus* I cannot venture to give any decided opinion.

Notaphus undulatus is *Bemb. undulatum*, Dej., Er.; *N. ustulatus*, *nebulosus*, *semipunctatus* and *obliquus*=*B. ustulatum*, Dej., Er.; *N. stictus* may correspond with the lately described *N. Dejeanii*, Putz.; *N. fumigatus* is Dejean's *Bembidium* of the same name; *N. ephippium*=*B. pallidipenne*, Dej. (non Ill.); *N. castanopterus* is a pale variety of *B. assimile*, Gyll., Dej., Er.

Lopha pæcila=*B. articulatum*, Dej.; *L. quadriguttata* and *quadrimaculata* are Dejean's species of the same names; *L. pulchra* is a bluish specimen of *B. celere*; *L. assimilis*=*B. Doris*, Ill., Dej., Er.; *L. pusilla* and *hæmorrhoidalis* are also the same as *B. Doris*, Ill.; *L. nigra*=*B. Mannerheimii*, Sahlb., Dej.; *L. pulicaria* and *minima*=*B. pusillum*, Gyll., Dej.; *L. nana* is wanting in Stephens's collection; *L. Doris* and *Spencii*=*B. assimile*, Gyll., Dej.

Tachypus celer=*Bemb. celere*; *T. acutus*, Marsh., is an immature specimen of the same species; *T. properans*, *chalceus* and *orichalcicus*=*B. velox*, Er.; *T. bipunctatus*=*B. bip.*, Dej., &c.; *T. chlorophanus* and *striatus*=*B. ærosum*, Er.

Bembidium impressum is quite distinct from *B. impressum*, Dej., being nothing but an ill-preserved specimen of *B. flavipes*.

Notiophilus tibiulis, Ste.=*N. palustris*, Er., whilst *N. palustris* of the Stephensian collection belongs to *N. biguttatus*, Er.

[As Dr. Schaum's remarks on the British Water-beetles, which form a part of his paper in the 'Entomologische Zeitung,' have already appeared, in a more detailed form, in this country (see Zoologist, pp. 1887 and 1932), it has not been considered necessary to reproduce them here.]

PSSELAPHIDÆ AND SCYDMENIDÆ.

Scydmanus ruficornis, Denny, is nothing but the female of *S. denticornis*. I have compared two of the specimens mentioned by Denny himself.

S. Wighami, Denny (also according to an original specimen which E. Doubleday communicated to me) is identical with *S. angulatus*, Kunze. The species could not be recognized from Denny's imperfect figure.

S. punctipennis, Ste., is a true *S. collaris*.

S. Dennii, Ste., as I had previously supposed, is the male of *S. denticornis*. Several species of this genus were incorrectly determined

in Stephens's collection; the descriptions in his works however are not taken from these specimens, but borrowed from Denny.

Euplectus Kirbii, Denny, of which I have examined the original specimen in the British Museum, is not identical with *E. signatus*, as Erichson and Aubé suppose, but with *E. Fischeri*, Aubé (*Tischeri*, Heer). Denny has overlooked the pit in the forehead which characterizes this species.

Stephens refers the *Euplectus sanguineus*, Denny, as a synonym to *E. minutus* of Marsham, but incorrectly; the specimen of the latter differs in nothing from an ordinary *E. signatus*.

E. ruficornis, Ste., is synonymous with *E. ambiguus*, Reichb.

Bythinus grandipalpus, Ste., is the female of *B. Curtisii*, Denny.

Bryaxis assimilis, Curt., I have not seen.

The specimen named *Bryaxis insignis*, Reichb., in Stephens's collection, does not agree at all with the true *P. insignis*, Reichb. (= *Tyrus mucronatus*), but is the same insect as *Bryaxis juncorum*.

VI.—On the mode of growth in Oscillatoria and allied genera.

By JOHN RALFS, M.R.C.S., Penzance*.

THE growth of the lower Algæ by repeated transverse division of their cells is now a well-established fact. In the *Desmidiæ* and the *Palmelleæ* this division is usually complete and gives rise to distinct individuals. In the latter family the common gelatinous matrix mostly retains them in such close connection that the entire mass is regarded as a frond, of which the cells are only portions. The case is essentially similar in the *Desmidiæ*; but in them the common matrix is so exceedingly thin that it can scarcely be detected, whilst the slightest touch scatters the cells, rendering their independence apparent, and hence each individual is considered a frond.

In *Tresias* and many other simple, filamentous Algæ, the divided cells remain closely united, and form a jointed filament which continues to elongate until the cells cease to divide.

I believe that in *Oscillatoria* we may trace a mode of growth of an intermediate kind and connecting these extremes. In many species of this genus the stratum spreads with great rapidity. This rapid growth cannot be caused by zoospores or granules vegetating in constant succession, because, although the filaments vary in length, their breadth is uniform. It does not depend on the simple elongation of the filaments, because, in many species, the filaments always remain short, notwithstanding the great increase of the mass.

The difficulty of tracing the growth in *Oscillatoria* is enhanced by its cells being frequently confluent, or having their divisions

* Read before the Botanical Society of Edinburgh, December 14, 1848.