generally present. (The ♂ paratype, however, possesses the basal cross-vein in the left hind wing, but not in the right.) In the case of the ♂ there can be no difficulty of identification, since the genitalia are so very characteristic, although difficult to examine without making a balsam preparation. In a dry specimen the paraprocts most nearly resemble those of *B. subnebulosa* Steph. in their square distal portions, but the termination of the appendage is quite different. From *mortoni* McL.—for a specimen of which I am indebted to Mr. K. J. Morton—the genitalia differ in the termination of the appendages, and also in the absence of the closely-set yellowish hairs dorsally on the apical segments of the abdomen.

The life-history of *B. rava* is probably similar (except hibernation) to that of *B. subnebulosa* Steph., which has already been described (Withycombe, Trans. Ent. Soc., 1922, pp. 540–542). I am unable to distinguish the larva from that of *subnebulosa*, except in that it is of a very pale greyish-brown colour and scarcely marked. There are probably several broods in the year, as imagines have been taken in May, August and September. Winter is passed as a free, full-fed larva and not within a cocoon. Thus the species differs from all other British Hemerobiidae that I have seen, with the exception of *Sympherobius* (*Eurobius*) *pygmaeus* Ramb. The allotype ♀ was bred from a larva which was found hibernating under the bark of a pine tree on the 7th December, 1922. It remained without feeding until April, 1923, when an elongate-oval cocoon of white silk was spun. This was not in any way different from the cocoon of *B. subnebulosa* Steph. The imago appeared on the 9th May, 1923. Thus *B. rava* differs from *B. subnebulosa* not only in structure, but also in its life-history.

It is to be expected that this species will be found to be more wide-spread now that its distinguishing characters have been pointed out. Confirmation of the hibernation of the larva is needed, as this is unusual.

NOTES ON THE BUTTERFLIES OF THE BANKS COLLECTION.

By H. T. G. Watkins.

The collection of insects made by Mr. (afterwards Sir) Joseph Banks (1743–1820), which came to the British Museum through the Linnean Society in 1863, contains 715 butterflies of 462 species and still includes 103 Fabrician types, a further 5 at least having been in the collection when described.

Fabricius records in his autobiography, of which a trans-

lation by Hope appears in the Transactions of the Entomological Society, vol. 4 (1845), that he inspected this collection among others periodically during seven visits to England from 1772 to 1791, and a large number of specimens bear labels in his writing. For this reason, as well as from the intrinsic and historical interest of many specimens obtained on Captain Cook's famous voyage in the "Endeavour" (1768–71), on which Banks went as naturalist, and the two subsequent voyages in the "Resolution" to the Pacific (1772–9), some notes on a recent rearrangement and study of the collection may be of interest.

From Eastern Australia ("New Holland") there are the types of 27 species or subspecies: *Danaida affinis, Tellervo zoilus, Acraea andromacha, Cethosia cydippe chrysippe, Cupha prosope, Precis hedonia zelima, Hypolimnas bolina nerina, Melanitis leda bankia, Yphthima arctous, Hypocysta irius, Mycalesis* (*Calysisme*) *perseus, M. sirius, M. terminus, Heteronympha merope, Lampides boeticus damoetes, Candalides erinus, Hypochrysops apelles, H. narcissus, Belenois java teutonia, Delias nysa, D. mysis, D. nigrina, Appias melania* (= *asteria*, Miskin), *Catopsilia pomona, Eurycus cressida* (and *harmonia* = *cressida* ♀), *Trapezites iacchus*. As there had been no previous scientific voyage to New Holland and there was no subsequent return from one prior to the publication of the Systema in 1775, it may be assumed that all these types were obtained during the voyage of the "Endeavour," and nearly all, as the specimens show, during the enforced sojourn at the future Cooktown in North Queensland in June to August, 1770. There are also specimens, not the types, of nine other Australian species not described from this collection: *Euploea corinna*, MacLeay, *E. hyems niveata*, Butler, *Danaida chrysippus petilia*, Stoll, *Hypolimnas alimena lamina*, Fruhst., *Zizera labradus*, Godt., *Hypolycaena phorbas*, Fab., *Delias argenthona*, Fab., *Appias paulina ega*, Bdv., *Hesperilla donnysa*, Hew. A further type, that of *Amblypodia* (*Arhopala*) *centaurus*, though described as from "New Holland," is certainly non-Australian. As pointed out by Butler (Cat. Lep. Fab. B.M., p. 179), it belongs to the race *nakula*, Felder, and is probably from Malacca.

From New Zealand (October, 1769, to March, 1770) there are the types of *Pyrameis gonerilla* and *P. itea*, and a pair of *Heodes salustius*, which was described by Fabricius, but not from this collection. From the Tonga Group (August, 1769) the types of *Precis villida* ("Amsterdam I." = Tongatabu) and *Doleschallia bisaltide drusius* ("Rotterdam I." = Namuka). From Tahiti (April to July, 1769) the type of *Melanitis leda solandra* and two pairs of *Hypolimnas bolina otaheitae*, Felder. From Hawaii a single ♂ of *Pyrameis tammeamea*, Esch., and from the W. coast of N. America a pair of *Polygonia satyrus*, Edw., all three probably obtained by the "Resolution," in

which, Banks having a difference of opinion with the Admiralty, the two Forsters had sailed in his place.

The five types now missing from the collection are (*Acraea*) *caecilia*, a ♀ from Sierra Leone with white band; (*Hamanumida*) *daedalus*, a ♂ d.s.f. from W. Africa, having a pale brown underside, not red-brown as in the subsequently described f. *melantha*, of which the type survives; (*Anteros*) *croesus* from Surinam, for which Fabricius, finding a prior *Papilio croesus* existed, gave the revised name *valens*, but both sink to *formosus*, Cram.; (*Huphina*) *licea* ♂, for which see below; and (*Oeneis*) *melissa* from Newfoundland. This last was described first in the Systema, and it seems probable that at one time there were two quite unconnected *melissa* types, as the name appears in F.'s writing on a specimen of *Euthalia kesava* ♂, and in the Species Insectorum of 1781 there is a reference after the description of the *Oeneis* to Cramer's figure of *Euthalia aconthea*. This, however, is omitted in the Entomologia Systematica of 1793.

The type of *Smyrna blomfildia* from Brazil, though referred to in F.'s later work, the Ent. Syst., as being in the Banks Collection, was described by him from Blomfield's Collection, and may never have belonged to Banks at all, especially as the latter had F.'s type of *proserpina*, which is identical. *Neonympha eurytris*, described in the same work from Jamaica, is presumably only a mis-spelling of *eurytus*, already described as in the Hunter Collection; no specimen is now in the Banks Collection.

Some notes follow on individual types still in the collection:

Cethosia cydippe chrysippe.—The type, a ♀ described as from "New Holland," has so narrow a white band that in this respect it resembles the New Guinea races *praestabilis*, Fruhst., and *damasippe*, Felder, but the underside is decidedly Australian. In three New Guinea ♀ ♀ from a single locality the band varies much in breadth.

Cynthia erota.—The type is a ♀ described from "Africa" which on a careful comparison with the series in the B.M. agrees best with Siamese specimens. The same applies to **Parthenos gambrisius**, described from "India orientalis."

Pyrameis itea.—The type of this common Australian species is, as has been said, from New Zealand.

Precis villida.—The types are undoubtedly from Tonga ("Amsterdam I," now known as Tongatabu). The Australian race, larger, with greyish or pale-ochreous, not tawny-marked, underside h.w., appears to be *calybe*, Godart.

Doleschallia bisaltide drusius.—This race from Tonga, apparently the most easterly known of this wide-ranging species, is distinguished, in the types at any rate, by the partial disappearance of the black edging above, so that the black bar from the costa of f.w. is disconnected from the terminal and apical

border; on the h.w. the dusky border is very narrow (2 mm.), and the black postdiscal spots in areas 2, 5 and 6 stand out clearly from the ground-colour. Underside deep rust-brown, the transverse lines and white markings of both wings distinct. ♂ 2 from "Rotterdam I." (Namuka). A ♂ from Fiji in the Adams Collection has a similar underside, but above the black border is normal, though the h.w. spots are sharply defined.

Catagramma astarte codomannus.—A ♂, most nearly resembling specimens from the Madeira River and from Matto Grosso in S.C. Brazil. It formed one of a small collection which had been pressed like dried flowers, and included the types of *C. hystaspes* ♂ and *Smyrna proserpina* (=*blomfildia*) ♂, also *Peridromia velutina* ♂ 2, *P. amphinome* ♂, *Adelpha mesenteria* ♂, *Victorina steneles* ♂, *Prepona omphale dives* ♂, and *Stalachtis cassiope* ♂ ♀.

Curetis aesopus and **phaedrus.**—Following Dr. Chapman in *Novit. Zool.*, xxii, p. 89, I certainly think these types are a pair (♀ ♂) from the same place in India, but cannot follow his separation of them from *thetis* Drury, as a species, *phaedrus*. In any event the name *aesopus* is prior to *phaedrus*. I think both names are synonyms of *thetis*, and that C.'s second species should be known as *arcuata* Moore (types in B.M. from Malabar).

Bindahara phocides.—The locality of this type, a ♀, labelled as from "Africa aequinoctialis," must be uncertain until better series of the races of this rather widely ranging species are available. It seems to agree best with the Bornean form.

Leptosia (**Nychitona**) **nina.**—This was a revised name given by Fabricius to the Indian species which he had described in the Species Insectorum as **xiphia**, when he found that he had already, from this same collection, described another "*Papilio xiphia*," the *Pararge* from Madeira, in the Systema. The name *nina* and not *xiphia* should therefore be used for the Pierid.

Huphina judith and **licea.**—The name *licea*, which Fabricius subordinated to *judith* in the Ent. Syst., is prior to it in the Mantissa, and must be taken as the specific name, although the type is lost. Described as from "Africa aequinoctialis," it agrees with the Sumatran race (*selma*, Weymer), which has a narrower border h.w. and blacker apex f.w. than *judith* from Java.

Appias sylvia.—The type is a ♂ from Sierra Leone. There is also a ♀ which F. had placed with his type, also from Sierra Leone, of **Mylothris rhodope**, which it much resembles. Owing to the similarity the *Appias* has sometimes been wrongly known as *rhodope* and the *Mylothris* has passed as *spica*, Moeschler.

Colotis (**Teracolus**) **rhexia.**—Misplaced labels led Butler and other authors to take a specimen of *Ixias pyrene* ♂ (the *sesia* of Fabricius) for the type of *rhexia*, which is fully described in the Systema and denotes 2 ♂ specimens of *Colotis evippe*, L.,

coming, as F. says, from Sierra Leone. It is probable that Linné in his original description of *evippe* (Syst. Nat., ed. 10, p. 469, no. 64, 1758) included the rather similar *Ixias marianne* and possibly also forms of *I. pyrene*, the latter being afterwards separated by him in Mus. Ulr., p. 241, 1764, and Syst. Nat., ed. 12, p. 762, no. 86, 1767. Drury, too, uses *evippe* for an *Ixias* in 1773. Hence probably Fabricius in 1775 labelled the *I. marianne* of the Banks Coll. as "*evippe*, L." and redescribed the W. African *Colotis* as *rhexia*. This name must be considered as a synonym (♂) of the race *arethusa*, Drury (♀), from Sierra Leone, typical *evippe* being from Angola.

Ixias pirithous.—The type is a ♀ of *pyrene pyrene*, L., and is certainly from S. China, though described as from "America borealis." The ♂ specimen, which was wrongly considered to be the type of *rhexia*, is also S. Chinese. Another ♂, placed with it by F. and bearing the label "*Sesia*," is S. Indian, probably Mysore.

Actinote pyrrha.—The type is a ♀ from S. Brazil (probably Rio, Nov.–Dec., 1768), and belongs to the species described by Dr. Jordan in "Seitz" as *carycina*. The allied species there called *pyrrha* should apparently be *morio*, Oberthür. Dr. Jordan concurs in this.

Oeneis polixenes.—The type, described from "America borealis," is a ♂, and agrees with Newfoundland specimens in the B.M. It belongs to the species, a form of which was subsequently described, probably from Hudson Bay or northern Labrador, as *subhyalina* Curtis, *fide* Elwes, who examined its type (in coll. Oberthür).

The **melissa** described by Fab. a few pages later than *polixenes*, and which had apparently a more dentate appearance (? more chequered fringes) and a more marbled underside, was probably the north-eastern race (= ? *oeno*, Bdv.) of *semidea*, but the type is now lost. Its description does not agree so well with *taygete*, Hb., the third similar species of that neighbourhood.

Though they are not types, being labelled "palaeno, L.," a pair of N. American *Colias* belonging to the species *pelidne*, Bdv., and having probably been taken, like the *O. polixenes*, on Banks' visit with Phipps to Newfoundland in 1766, are of considerable interest. They seem to be intermediate in size between the forms *laurentina*, Scudder, from Cape Breton I, and *labradorensis*, Scudder. Each has the central spot of the h.w. beneath rust-coloured only without a silver centre, rosy fringes and basal spot, and (for this species) a broad border above, hardly veined in the ♂. Possibly they are from the northern part of Newfoundland, but they do not agree exactly with any of the *laurentina* from Newfoundland and South Labrador in the B.M., nor with any of a long series of *labrador-*

ensis from the east coast. It is tempting, but I fear unjustifiable, to suggest that the passage of 157 years may have produced some slight visible change in the unstable variable forms of *Colias* in North America.

The following is a list of the remainder of the types in the collection: *Acraea murcia* (♀ of *camoena*, Dr.), *A. quirina*, *A. encedon*, L., ♀ f. *lycia*, *A. bonasia*, *Planema gea*, *Heliconius erato phyllis*, *Precis pelarga*, *P. harpyia* (= *pelarga* ♀), *Hypolimnas bolina bolina*, L., ♀ f. *avia*, *Eunica maja*, *Neptis heliodore*, *Lebadea martha*, *Euphaedra eupalus*, *E. ceres*, *Euthalia* (*Cynitia*) *cocytus*, *Cyrestis camillus*, *C. cocles*, *C. periander*, *Nymphalis* (*Charaxes*) *marica* (♀ of *tiridates*, Fab.), *N. fabius*, *Faunis arcesilaus*, *Dynastor darius*, *Erebia mergus* (= *medusa*, Schif.), *Euptychia hermes*, *Zemeros flegyas allica*, *Abisara gerontes*, *Neochrysops parsimon*, *Heodes hiere* ♂ ♀ (= *alciphron*, Rott.), *Iolaus helius* (= *eurisus*, Cr.), *Deudorix jarbus*, *Lycaenesthes moncus* (= *sylvanus*, Dr.), *Calycopis endymion*, *Tmolus cleon*, *Myrina silenus*, *Dapidodigma hymen*, *Marmessus lisias*, *Mylothris chloris*, *Appias saba* (= *epaphia*, Cr.), *Pareronia valeria hippia*, *P. valeria philomela*, *Nepheronia argia*, *Colias lesbia* ♂ ♀, *Catopsilia florella*, *C. argante*, *Ornithoptera heliacon* ♂ and *artenous* ♀ (= *helena helena*, L.), *Papilio* (*Araminta*) *zenobia*, *P. brutus* (= *dardanus dardanus*, Brown), *P.* (*Harimala*) *perantus* ♂ ♀, *P.* (*Erioptera*) *doreus* (= *phorcas*, Cr.), *P.* (*Idaides*) *empedocles*, *Leptocircus curius*, *Jemadia gnetus*, *Tagiades flesus*, *Ceratrichia phocion*, *Cecropterus aunus*.

Claims have been made for several of the specimens which belong to the Fabrician species and bear labels in his writing that they are his types, but unless the species is described by F. as being in the Banks Collection, these ascriptions seem to me quite unsafe. It may be that Banks, who outlived Drury and other contemporaries, acquired some types out of their collections, but at present there is no evidence. In conclusion, I wish to express my best thanks to Captain Riley for constant advice and help.

Brit. Mus. (Nat. Hist.),
S. Kensington.

STUDIES AMONG THE AMERICAN GALERUCIDAE (COL.).

By F. C. Bowditch.

(Continued from page 110.)

The Central and South American species of *Galerucella* have received scant attention and even at that they appear to be mixed up. *Gal. fusco-maculata* Jac., Proc. Zool. Soc., 1889, p. 291, is pre-occupied (used in Biologia) and should be changed to *jacobyi*