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Title: The Natural History Museum Collection of Ornithoptera (Birdwing) Butterflies (Lepidoptera: Papilionidae)

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Source: Ackery, P. R. (1997). The Natural History Museum Collection of Ornithoptera (Birdwing) Butterflies (Lepidoptera: Papilionidae). *The Biology Curator, Issue 8*, 11 - 17.

URL: <http://www.natsca.org/article/490>

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Place a small amount of the mountant on a clean microscope slide and put the sample into it. Gently lower a clean coverslip onto the slide and leave to air dry.

As the Karo mountant dries, it will shrink away from the edges of the coverslip, bleed more solution under the coverslip with a clean Pasteur pipette.

The Karo will eventually set hard over a number of days. There may be a problem with the introduction of air bubbles into the mountant when the extra mountant is bled under the coverslip. This appears to be unavoidable because we have not found a way of preventing it.

When the mountant is set, wipe any excess mountant away from the coverslip with a damp tissue.

Mounting of Pollen Samples

The pollen sample should first be cleaned (details available) and suspended in 50% glycerol solution, in a centrifuge tube.

Centrifuge the sample at approximately 3000 rpm for 3 minutes and decant off the liquid.

Mix glycerine jelly with a small amount of phenol.

Take a subsample of the prepared pollen and mix with a small amount of the glycerine jelly. Place the sample on a microscope slide which has been cleaned with alcohol, and put two small pieces of plasticene on the slide, one either side of the sample. Gently warm the sample to melt the glycerine jelly then stir the sample with a needle, to disperse the specimens.

Gently lower a clean coverslip onto the sample so that it is supported by the plasticene. Bleed melted paraffin wax under the coverslip to seal the slide. When the wax has cooled and set, it will support the coverslip and stop it from crushing the specimens, but the plasticene stays in place.

ECONOMIC BOTANY AND TIMBER COLLECTIONS

Demonstrated by Dr A.S. Gunn, Department of Botany, Liverpool Museum, National Museums and Galleries on Merseyside, William Brown Street, Liverpool L3 8EN.

The system of drawers for the storage of economic botany items, including timbers, used at Liverpool was demonstrated. The system, based on engineering type metal cabinets has drawers which can be flexibly sub-divided. The economic botany specimens are stored in the drawer compartments in their original packaging. Plastazote packing wedges are used to prevent items such as glass vials from moving when the drawers are open or closed. Many specimens are held in old glass-topped display boxes which are deteriorating and these are being rehoused into acid-free cardboard boxes. Ideally some of the material could be stored in clear, air-tight plastic boxes but the cost involved prevent this being applied for all the items in the collection at the moment. The possibility of transferring items stored in polythene packets which are beginning to degrade into polyester packets was also discussed.

THE NATURAL HISTORY MUSEUM COLLECTION OF *ORNITHOPTERA* (BIRDWING) BUTTERFLIES (LEPIDOPTERA: PAPILIONIDAE).

by Phillip R. Ackery

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Synopsis

A brief outline is given of the *Ornithoptera* butterflies, with particular attention to The Natural History Museum's collection of these exquisite insects, how this collection was accumulated, and its present state in terms of curation and information recall. A number of individual specimens of special historical interest are highlighted.

The Birdwing Butterflies — an introduction

In the world of butterflies the Birdwings occupy a position comparable with the Birds of Paradise in Ornithology — a combination of history, romance and beauty gives them unrivalled status within the Lepidoptera. They belong to the Swallowtail family, the Papilionidae, a mainly tropical grouping of some 600 often spectacular species. Conventionally, the Birdwings have been divided into three genera, the smallest, *Trogonoptera*, contains just two species, eighteen species belong to *Troides*, while the twelve most dramatic species of all make up *Ornithoptera*, the primary subject of this article.

Ornithoptera ranges from the Moluccas to the Solomons and southwards into Australia (Queensland). With eight species, the island of New Guinea has the richest *Ornithoptera* fauna. Seven species (*alexandrae*, *rothschildi*, *goliath*, *chimaera*, *tithonus*, *meridionalis*, *paradisea*) are found only in the island of New Guinea; another, *O. victoriana*, is endemic to the Solomons (plus Bougainville, which is politically part of Papua New Guinea). The remaining four species belong to the *priamus* complex — *aesacus* from Obi island, *croesus* from the islands of Batjan, Halmahera and Ternate, *urvillianus* from the Bismarck Archipelago (but not New Britain), and *priamus* itself ranging from the Indonesian islands of Seram and Ambon through New Guinea and northern Australia to New Britain.

Why, then, are these butterflies so attractive to the acquisitive collector? Well, they certainly have measurable status as the largest butterflies in the world, and the female of Queen Alexandra's Birdwing, *O. alexandrae*, is the largest of all with a wingspan reaching 260 mm. Females are quite sombre, especially when compared to the males in which either green, gold or blue invariably contrasts against a rich black background. They are surely the most dramatic of all butterflies. The Birdwings also have powerful historical associations, both with classic insect hunters of the 19th and early 20th century, and with the great private collections built up at the same time. And, rarely for insects, some individual specimens have achieved fame as 'museum objects' in their own right. This level of interest has generated a large and exquisitely illustrated literature, notably the early works of Rippon (1889-1907) and Jordan (1908), and more recently

D'Abrera (1975), Haugum & Low (1978-9; 1982-5), Igarashi (1979) and Ohya (1983).

In some parts of their ranges, *Ornithoptera* species are doubtless already seriously endangered. However, some, such as *O. victoriae*, *goliath* and *priamus*, appear to be common, at least locally (Collins & Morris, 1985; Parsons, 1992a). Only *O. alexandrae* is classified as endangered (see also Sands, 1996). The Convention on International Trade in Endangered Species (CITES) restricts the 'market' for these butterflies, with *O. alexandrae* Appendix-I listed (all trade banned) and all other Birdwings Appendix-II listed (trade monitored with permits required from countries of origin and entry). Parsons (1992a) suggests that this is more emotional than rational with at least four *Ornithoptera* species sufficiently common to not justify CITES ranking. A glance through such journals as *Insektenbörse* indicates that Birdwing specimens are still commercially available. Indeed, proposals have been made for economic utilisation of *Ornithoptera* specifically for commerce (e.g. Parsons, 1992b). So, almost uniquely among the Lepidoptera, restrictions on availability, together with mystique and traditions, have given the *Ornithoptera* an aura of desirability and real fiscal value. This necessitates a level of museum security otherwise seldom considered for entomological collections.

The Natural History Museum *Ornithoptera* Collection

The Natural History Museum, London (still known under its international abbreviation BMNH) has some 3,000 *Ornithoptera* specimens, stored in nearly 200 former Rothschild collection drawers. Drawers of this design are glazed both top and bottom, so with the butterflies pinned (and cross-pinned) into narrow slats, both the upper and underside of wings can be viewed without direct handling of the specimens themselves. For now, the drawers remain in original, gently deteriorating Rothschild cabinets. But with ever-increasing concerns regarding the vulnerability of insect collections to pest infestation it is hoped that the current drawers will soon be re-housed in modern pest-proof metal cabinets. At present, taxa-level recall is by card index down to infrasubspecies. Although *Ornithoptera* only contains some 12 species, the infraspecific variation in pattern is such that sub-species and forms have been described with great zeal — about 200 species-group, form and variety names are associated with the genus. All these names together with related information should shortly be available in computerised form as part of an on-going project involving the input of all such data relating to the BMNH holdings of Papilionidae and Pieridae.

The lay-out of the Birdwing collection has changed little since the early 1970s when Mr. T. G. Howarth amalgamated all the BMNH Birdwing material into a coherent series; at the same time, the types of the group held in the BMNH were meticulously catalogued (Howarth, 1977). Since then, few changes have been made beyond those necessitated by the incorporation of some important new acquisitions, principally the collections of the late Mr Andrew Low and Mr Alan Sharman. The primary series contains most of the material, arranged in a geographical sequence within sub-species and species. Specimens with little associated data, and some with

duplicate data, are stored in a relatively small Supplementary Collection.

Current collection security measures require that there is no unsupervised access to the Birdwing collections. To further restrict availability, the collection is held under a unique key. Even so, abused 'trust' has resulted in one known security breach since the collection was laid out. So, an annual audit has been set in place. This is quite straightforward as the individual specimens are now each labelled with a unique sequential number that can be readily seen. The number itself relates to the Entomological Department's central database that contains all information pertinent to each particular specimen — determination, type status where applicable, locality data, origins, drawer number. And it is this information that provides the basis for the brief sketches given below.

Collection Origins

Of the 3 million or so butterflies in the BMNH collections about one-third originate from the Rothschild Bequest, one-third from other major private collections (including the Oberthür, Levick, Fruhstorfer and Joicey collections) and one-third from a multitude of lesser donations and purchases acquired largely over the last 150 years. The *Ornithoptera* depart slightly from this general profile. Of the 3,000 specimens, 1,322 originated from the Rothschild Bequest, 737 from other major collections, with most of the remainder from well-known lesser sources (Godman-Salvin Collection, Adams Bequest, Rait-Smith Bequest etc.).

Between 1927, with the purchase of a substantial part of the Oberthür Collection, and 1941, when the Levick collection was bequeathed, the BMNH acquired something like 60% of its present butterfly holdings. More than anything else, this was probably due to the influence of Lionel Walter Rothschild, a Trustee of the British Museum (Natural History) from 1899 until 1939, and Norman Riley, two outstanding personalities of the butterfly world. N. D. Riley was Head of the Entomological Department from 1932 until 1955; he joined the staff in 1911 and was still actively associated with the Department until shortly before his death in 1979. Individually they would have been formidable — acting in tandem irresistible! A brief outline of some of these outstanding acquisitions, and the *Ornithoptera* contained in them, is given below.

The Rothschild Bequest contains perhaps some 2.25 million Lepidoptera (registered as "BM (Ent.) 1939-1"), mostly Macrolepidoptera, of which perhaps 900,000 are butterflies. Shortly before his death in 1937, Lord Rothschild signed a memorandum offering his private museum and collections to the Trustees of the British Museum (Natural History), to whom the Bequest ultimately passed. Although specimens of a few lepidopterous groups were quite rapidly assimilated into the BMNH collections, it was not until 1971 that the major part of the collection was even accommodated in the Entomological Department at South Kensington. Specimens originating from Rothschild's *Ornithoptera* collection, some 45% of the BMNH's total holdings of the genus, include important type material, often of taxa described by Rothschild himself in the Tring Museum journal *Novitates Zoologicae*. Of the currently recognised species, Rothschild described

alexandrae, *chimaera* and *meridionalis*, as well as the celebrated 'Ornithoptera allottei', now generally regarded as a hybrid *priamus* × *victoriae*.

Perhaps Rothschild's most renowned collector of Birdwings was A. S. Meek (1871-1943). Meek's writings, notably *A Naturalist in Cannibal Land* (Meek, 1913), suggest a formidable character well able to endure personal hardship. This is graphically illustrated in published extracts from his personal correspondence with Lord Rothschild detailing the adversities surrounding the capture of the first known male of *O. chimaera* (Rothschild & Jordan, 1905). In addition, Meek captured one of the most famed Birdwing specimens, the female holotype of *O. alexandrae* discussed below.

The J. J. Joicey Collection rivals the Rothschild Bequest in terms of coverage, if not actual specimen numbers. Although far less widely known than Rothschild, Joicey also established a private museum, at Witley in Surrey. During 20 years, he amassed a considerable collection of some 400,000 Lepidoptera specimens, excluding 75,000 generously donated to the BMNH during his lifetime. The Bequest ("BM (Ent.) 1934-120") included almost 10% of the current BMNH holdings of *Ornithoptera*. Joicey's best-known collectors of Birdwings were the family Pratt — the patrician and wonderfully named Antwerp Edgar Pratt (author of *Two Years among New Guinea Cannibals*, 1906, a graphic account of his collecting experiences), and his sons, Charles, Felix, Harry and Joseph. After initially visiting South America (1912), family members in various combinations concentrated efforts on the New Guinean subregion. In 1913-14, they stayed for several months in Irian Jaya, principally the Arfak Mountains, and in Waigeu and the Schouten Islands, and in 1919-21 visited Seram, the Weyland mountains of Irian Jaya and Mefor island, before venturing on to Sumatra in 1921 and Buru in 1922. Their accumulated specimens include type material of various taxa described by Joicey in co-authorship with either G. Talbot or N. Noakes, most notably subspecies of such choice *Ornithoptera* species as *chimaera*, *paradisea*, *meridionalis* and *tithonus*.

Charles Oberthür (1845-1924) lived at Rennes in Brittany. His interest in Lepidoptera, and the expertise available to him through the family firm of printers, happily combined in the production of two finely illustrated lepidopterological journals, *Études d'Entomologie* and *Études de Lepidopterologie comparée*. Upon his death in 1924, various parts of his collection were acquired by a range of authorities — many of the *Ornithoptera* passed to John Levick, a private British collector. The substantial material that came directly to the BMNH included very few Birdwings ("Bm (Ent.) 1927-3"; Norman Riley, 1927, gives an entertaining account of the logistics involved in moving 750,000 Lepidoptera from Brittany to South Kensington!). It was not until 1941 that the Levick Bequest ("BM (Ent.) 1941-83") passed to the BMNH, and with it 269 *Ornithoptera*, mostly former Oberthür specimens. John Levick seems to have become a somewhat shadowy figure in comparison to Joicey, Riley, Rothschild and Jordan. But correspondence held in BMNH archives suggest he played a significant role in Museum's acquisition of various important collections.

Personalities and Specimens

Alfred Russel Wallace was a contemporary and associate of both Henry Walter Bates (with whom he travelled in South America) and Charles Darwin, his co-author of the classic paper on the theory of evolution read at the Linnean Society in 1858. Of Wallace's huge output of publications, two major works, *The Geographical Distribution of Animals* (Wallace, 1876) and *Island Life* (Wallace, 1880) guaranteed a pre-eminence in the field of Biogeography recognised still in the 'Wallace Line', the famous supposed boundary that he identified between the Australian and Asian faunas.

Perhaps more than anything else, one wonderfully evocative paragraph accounts for Wallace's association with the Birdwing butterflies. He was on Aru Island in the Moluccas when he wrote "The next two days were so wet and windy that there was no going out; but on the succeeding one the sun shone brightly, and I had the good fortune to capture one of the most magnificent insects the world contains, the great bird-winged butterfly, *Ornithoptera poseidon* [now treated as a *priamus* subspecies]. I trembled with excitement as I saw it coming majestically towards me, and could hardly believe I had really succeeded in my stroke till I had taken it out of the net and was gazing, lost in admiration, at the velvet black and brilliant green of its wings, seven inches across, its golden body, and crimson breast. It is true that I had seen similar insects in cabinets at home, but it is quite another thing to capture such one's self — to feel it struggling between one's fingers, and to gaze upon its fresh and living beauty, a bright gem shining out amid the silent gloom of a dark and tangled forest. The village of Dobbo held that evening at least one contented man" (Wallace, 1869). The passage suggests a tranquility missing from his account of capturing *Ornithoptera priamus croesus* — "on taking it out of my net and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death. I had a headache for the rest of the day, so great was the excitement produced. . . .".

In the preface to the 10th edition of *The Malay Archipelago* Wallace (1890) declares that his complete collections of birds and butterflies were, by then, in the British Museum. This is difficult to reconcile with the source information of the known Wallace *Ornithoptera* in the Natural History Museum collections. None of this material seems to have been presented directly by Wallace — all of it comes from secondary sources, and after 1890 when Wallace wrote this statement. The fifteen BMNH *Ornithoptera* unequivocally

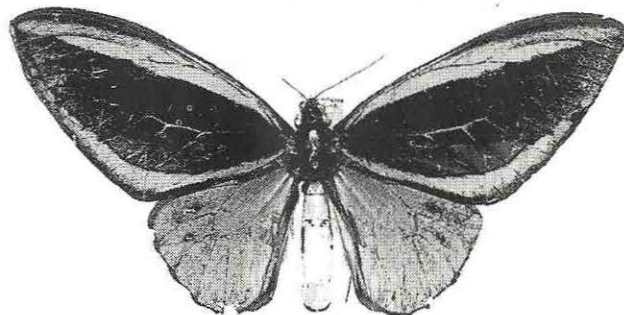


Figure 1. *Ornithoptera priamus poseidon* Doubleday. BMNH 133261. Male. Arru Wall/Aru I. Wallace/Godman-Salvin Coll. 95.-5

collected by Wallace, includes four males of *O. priamus poseidon* from Aru (see Figure 1), each of which might be the actual individual that so moved Wallace at Dobbo. Similarly, there are two females and one male of *croesus* from Batjan. Again, it is frustrating that the available labelling gives no indication as to which (if any) of these specimens might have been involved in Wallace's account.

Sir James Brooke has a rather tenuous association with the Birdwing butterflies, but the link is fascinating in drawing attention to an unconventional aspect of British colonial history — the White Rajahs of Sarawak. In honour of Sir James Brooke, Wallace (1855) described a new species of Birdwing as *Ornithoptera brookiana*, now commonly placed as one of two species in the genus *Trogonoptera*. Wallace clearly had a single specimen in his possession originating from the Ranang River, north-west coast of Borneo. A single male in the BMNH collection (Figure 2) has been widely identified as this individual. It is certainly a Wallace specimen, clearly originating from Sarawak (and no more likely candidate as the original specimen is known to exist). But doubts as to the authenticity of this specimen as a true 'type' remain, reservations reflected in its past history as holotype, lectotype and neotype of *Ornithoptera brookiana* (see Haugum & Low, 1978-9).

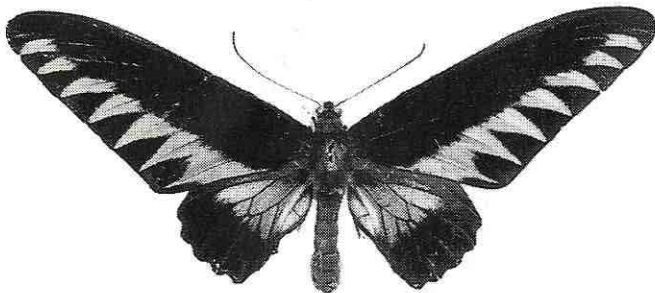


Figure 2. *Trogonoptera brookiana* Wallace. Male Lectotype. Sarawak, Borneo. Wallace./Godman-Salvin Coll. 95.-5.

According to Margaret Brooke (Brooke, 1913), the wife of his successor, James Brooke became Rajah of Sarawak in 1841 largely by public acclaim and through friendship with the heir-apparent, Rajah Muda Hassim. For his own times, Brooke's views were certainly highly progressive. Wallace (1855) when naming *Ornithoptera brookiana* in his honour said "I have named it after Sir J. Brooke, whose benevolent government of the country in which it was discovered every true Englishman must admire". Sir James founded a mini-dynasty that was to last almost 100 years, encompassing three generations of White Rajahs. He was succeeded in 1868 by his nephew Charles, seemingly a much less charismatic individual who nevertheless had the reputation for continuing the enlightened tradition established by his uncle. His was a long reign, almost 50 years; it wasn't until 1917 that his son, Vyner Brooke, took up the title. This somewhat anachronistic dynasty came to an end in July 1946 when Sarawak was finally ceded to the British Crown.

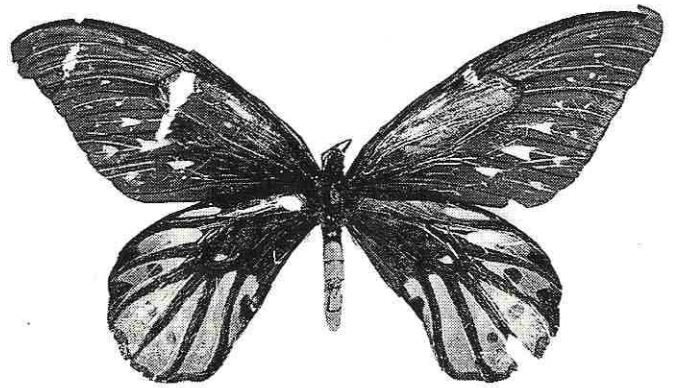


Figure 3. *Ornithoptera alexandrae* Rothschild. Female Holotype. BMNH 102847. N.E. Coast (inland) B. N. G. Meek/Rothschild Bequest. B.M. 1939-1.

The shot Birdwings in the BMNH collections are renowned as 'curios'. Understandably, much of this material is quite badly damaged! Rothschild (1907) described *Ornithoptera alexandrae* on the basis of a unique female (now in the BMNH: specimen number 102847 — see Figure 3) taken by Meek in January 1906 "from the north-east coast of British New Guinea inland to the headwaters of the Mamberé River". Rothschild neither mentioned the copious perforations in the wings nor suggested that it was damaged by shooting. However, a letter from Meek to Karl Jordan written at Biagi (Papua New Guinea) in February, 1906, and held at the BMNH (Meek correspondence, Letter 155), confirms the unorthodox collecting method — "Enclosed is female of large *Ornithoptera* shot by me on way up only two days from coast. This one is a small specimen, mostly running much larger. Females seem to be not too uncommon . . .". Jordan (1908) affirms this in quoting from the label (plausibly in his own hand) associated with the specimen "Type of species shot. The only specimen collected on that expedition". In his subsequent travelogue, Meek (1913: 161) recounts using a shot-gun in a vain attempt to obtain a male of *Ornithoptera chimaera*, but for some reason he does not specifically record using this collecting method for *alexandrae*, his most spectacular find.

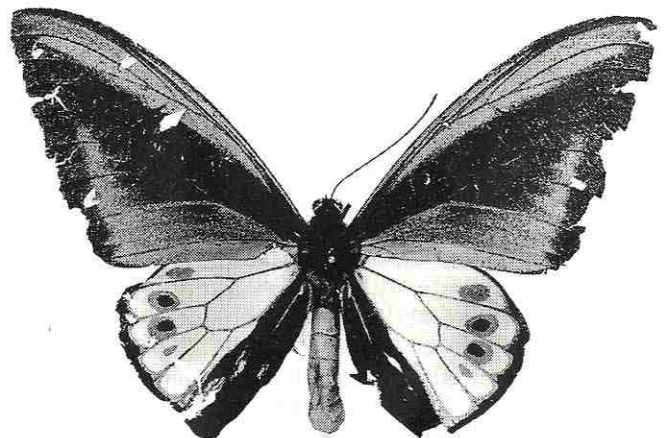


Figure 4. *Ornithoptera goliath huebneri* Rumbucher. Male Paratype. BMNH 135166. Goodenough Isl., 2500-4000 ft., March-May 1914. A. S. Meek./Presented by J. J. Joicey Esq. Brit. Mus. 1931-291.

Additionally, Rothschild, Joicey, and probably Oberthür, obtained material of *O. goliath* from Goodenough Island off eastern Papua New Guinea, again collected by A. S. Meek. The Rothschild and Joicey examples are in the BMNH collection. Although these specimens are characteristically perforated (see Figure 4), they have never achieved the curiosity status of the female type of *O. alexandrae*. Rumbucher (1973) based his description of a new subspecies of *goliath*, *Ornithoptera goliath huebneri*, upon this ex-Meek material. Rumbucher quoted correspondence between the entomological dealer, O. E. Janson, and Charles Oberthür stating "He [Meek] was only able to obtain a few specimens by shooting them as they always flew only about the tops of the highest trees and he couldn't induce them to come down. They are therefore very shattered, as you will see by the one we send you. We regret very much, not to have received better specimens". The type-series in the BMNH collection comprises four males and four females (specimen numbers 135164-71).

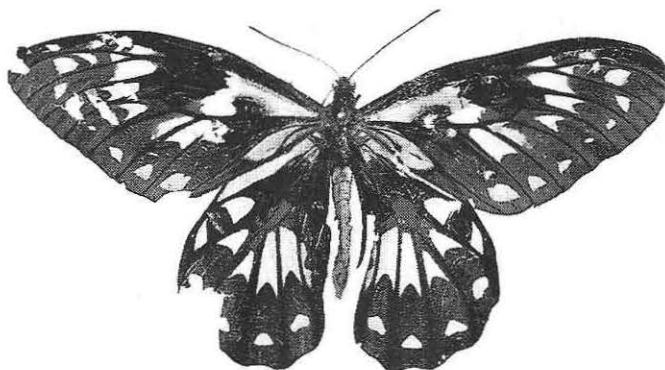


Figure 5. *Ornithoptera victoriae* Gray. Female Holotype. BMNH 102737. Guadalcanal, Wanderer Bay? [Macgillivray] Voyage of H.M.S. Herald. 55-69./Feejee or Solomon Isl.

But most famous of all is the single female specimen captured by John MacGillivray on the voyage of HMS Herald, and described by Gray (1856) as *Ornithoptera victoriae* (specimen number 102737 — see Figure 5). Gray created both a legend and a mystery — "its flight is very elevated; so much so that it became necessary to employ powder and shot to secure the specimen" and "the locality . . . is supposed . . . to be either Solomon Islands, Aneitum, New Hebrides or the Fiji group". Tennent (1997) details how embellishment of the former has continued, and how the latter has been resolved. MacGillivray's manuscript diaries, held in the Public Records Office for England and Wales, are explicit. The entry for 28th December 1854 made at Wanderer Bay on the south coast of Guadalcanal reads "A few insects were taken, among these was a splendid specimen of *Ornithoptera priamus?* f. which I shot, not having a net" — an unequivocal locality and no reference to the butterfly flying too fast or too high, just no net available! As Tennent (1997) notes, by the following day he had provided himself with a net!

The ghost of Gray's initial statement haunted Grose-Smith's (1887) account of the capture of the first known males of *O. victoriae* by C. M. Woodford. Again they are said to have been shot. However, quoting from Woodford's (1890) own account, Tennent clearly shows that although the taking

of the males was unconventional (one knocked down by natives with a bush and the other netted by a naked Woodford!), no male was shot; only the females were taken in this way.

Postscript. Stansfield (1994) identifies the traditional role of natural history museums as the recording and classification of the natural world. And quoting from the Natural History Museum's Corporate Plan for 1986 he demonstrates that their role as the basis for "much experimental work and scientific endeavour" has continued to develop. The historical component in many natural history collections seems to be consistently understated, yet it has much to say both in terms of the history of Natural History and the age of exploration in which many of these collections were assembled. Perhaps there are two major constraints on developing this aspect of natural history in public galleries — firstly, the current vogue for topic related exhibits that tend to have low reliance on actual specimens, and secondly, the absence of available information on how natural history specimens can be exhibited safely.

Acknowledgements

I am especially grateful to Mr John Tennent for sharing his findings with regard to the holotype of *Ornithoptera victoriae* (and much entertaining discourse). Mr Peter Pratt (Croydon) kindly provided information regarding the complicated relationships of the various collectors "Pratt"; Mr John Thackeray (BMNH Archives) gave me access to the relevant correspondence between Levick and Riley, and Meek and Jordan; Mr. Phil Crabb (BMNH Photo Studio) prepared the photographs. Mike Parsons (University of Florida) and my immediate colleagues, Julia Pope, Dick Vane-Wright, Jim Reynolds and Mike Fitton, suggested many improvements and additions to the manuscript, and without Brian Pitkin's expertise the specimen-level database to the *Ornithoptera* would not have materialised.

References

- Brooke, M. 1913. My Life in Sarawak. Consulted in the 6th impression (1992) of the Oxford University Press paperback of 1986, xxviii+320 pp.
- Collins, N. M., and M. G. Morris. 1985. Threatened Swallowtail Butterflies of the World. The IUCN Red Data Book. IUCN, Gland & Cambridge, vii + 401 + [i] pp., 8 pls.
- D'Abrera, B. 1975. Birdwing Butterflies of the World. Lansdowne Press, Melbourne, [viii] + 260 pp.
- Gray, G. R. 1856. On a new species of lepidopterous insect. Proceedings of the Zoological Society of London, 1856:7, pl. 39.
- Grose-Smith, H. 1887. Description of the hitherto unknown male of *Ornithoptera victoriae* Gray. Annals and Magazine of Natural History, (5)19:445-6.
- Haugum, J., and A. M. Low. 1978-9. A Monograph of the Birdwing Butterflies. The Systematics of *Ornithoptera*, *Troides* and related genera. The genus *Ornithoptera*. Scandinavian Science Press, Klampenborg, 1(1-3), 308 pp.
- Haugum, J., and A. M. Low. 1982-5. A Monograph of the Birdwing Butterflies. The genera *Trogonoptera*, *Ripponia* and

Troides. Scandinavian Science Press, Klampenborg, 2(1-3), 356 pp.

Howarth, T. G. 1977. A list of the type-specimens of *Ornithoptera* (Lepidoptera: Papilionidae) in the British Museum (Natural History). Bulletin of the British Museum (Natural History), Entomology, 36:153-169.

Igarashi, S. 1979. Papilionidae and their early stages. Kodansha, Tokyo, 2 vols. 218+[xvii] pp., 223 + 32 + 102 pls.

Jordan, K. 1908. Gattung *Papilio*. In Seitz, A. (ed.) Die Gross-Schmetterlinge der Erde. Fritz Lehmann Verlag, Stuttgart, 5:11-44.

Meek, A. S. 1913. A Naturalist in Cannibal Land. T. Fisher Unwin, London, xvii+238 pp., frontispiece + 35 pls.

Ohya, T. 1983. Birdwing Butterflies. Kodansha, Tokyo, 332 + [ii] pp [includes 136 colour plates].

Parsons, M. J. 1992a. The butterfly farming and trading industry in the Indo-Australian region and its role in tropical forest conservation. Tropical Lepidoptera, 3 (Supplement 1): 1-31.

Parsons, M. J. 1992b. The world's largest butterfly endangered: the ecology, status and conservation of *Ornithoptera alexandrae* (Lepidoptera: Papilionidae). Tropical Lepidoptera, 3(Supplement 1): 33-60.

Pratt, A. E. 1906. Two years among New Guinea Cannibals. A naturalist's sojourn among the aborigines of unexplored New Guinea. Seeley & Co., London, 360 pp., 54 pls., 1 map.

Riley, N. D. 1927. The Oberthür Collection of Butterflies and Moths. Natural History Magazine. London, 1:83-90.

Rippon, R. H. F. 1889-1907. Icones Ornithopterorum: a monograph of the Papilionidae tribe of *Troides* of Hübner, or *Ornithoptera* [Bird-wing Butterflies] of Boisduval. R. H. F. Rippon, London, 2 vols. 1:[iii] + 86 pp., text-figs, 45 hand coloured & plain plates and maps; 2: frontispiece, 104 pp., 83 colour & plain text-figs, 59 hand coloured plates & maps.

Rothschild, W. 1907. *Troides alexandrae* spec. nov. Novitates Zoologicae. London, 14:96.

Rothschild, W. and K. Jordan. 1905. On some new Lepidoptera discovered by A. S. Meek in British New Guinea. Novitates Zoologicae. London, 12:448-78.

Rumbucher, K. 1973. Eine Neue Underart von *Schoenbergia goliath* sowie zwei markante Individualformen in der Gattung *Ornithoptera* (Lep., Papilionidae). Entomologische Zeitschrift. Frankfurt a.M., 83:1-10.

Sands, D. 1996. Birdwing blues. Wildlife Australia, 1996 (Autumn): 7-9.

Stansfield, G. 1994. Functions and Organisation of Natural History Museums. In Stansfield, G., J. Mathias and G. Reid (eds) Manual of Natural History Curatorship. HMSO, London, pp. 1-10.

Tennent, W. J. 1997. The type locality of *Ornithoptera victoriae* Gray, 1856, and the circumstances of the capture of the holotype female (Lepidoptera: Rhopalocera). Archives of Natural History [in press].

Wallace, A. R. 1855. Description of a new species of *Ornithoptera*. Proceedings of the Entomological Society of London, (2)3:104-5.

Wallace, A. R. 1869. The Malay Archipelago; the land of the Orang-utan and the Bird of Paradise: a narrative of travel with studies of man and nature. MacMillan & Co., London [consulted in 10th edition, 1894] xvii + 515 pp., frontispiece + 5 illustrations, 10 maps.

BOOK REVIEW

The Moths and Butterflies of Great Britain and Ireland - Volume 3

Yponomeutidae - Elachistidae

Editor: A Maitland Emmet

Published by Harley Books: ISBN 0 946589 43 7 (hardback) - £75

ISBN 0 946589 56 9 (paperback - due March) - £37.50

There has been quite a long gap since the publication of the last volume in this series, Volume 7 part 2 in 1991, and a very long time since the series began in 1976. This latest volume is worth the wait and will have a very significant impact on the study of 'micro' Lepidoptera in the UK. It covers the families Yponomeutidae, Epermeniidae, Schrechensteiniidae, Coleophoridae and Elachistidae. Only the Elachistidae have been served by a relatively recent, easily available text in English (Traugott-Olsen & Nielsen's *The Elachistidae of Fennoscandia and Denmark* in 1977). The Coleophoridae were an especially difficult family to learn, due to a lack of texts and the critical status of many species.

This volume follows the established style for the series with keys to species, species accounts and vice-county distribution maps. Due to the number of difficult taxa, there are hundreds of excellent genitalia illustrations for both males and females. For genera such as *Coleophora* there are keys to the genitalia as well as keys to the moths. In addition, the Coleophoridae, which mostly live as larvae inside portable cases, have a key to these cases, beginning with the foodplant. These are accompanied by superb illustrations of cases on eight plates, followed by nine excellent plates illustrating the adult stages of species of all the families in this book. The distribution maps for many species show that many gaps in knowledge occur; which the publication of this book should help to change.

These volumes are always characterised by an introductory chapter on an aspect of Lepidoptera and this one is no exception. The subject is Invasions of Lepidoptera into the British Isles and contains many maps showing the spread of species such as *Polchrysis moneta* and *Lozotaeniodes formosanus* across the UK (The latter finally reached Lancashire in the summer of 1996). The discussions cover rates of spread and possible governing factors.

An excellent continuation of a classic series which will be a standard for a long time.

Wallace, A. R. 1876. *The Geographical Distribution of Animals with a study of the relationships of living and extinct faunas as elucidating the past chances of the earth's surface.* MacMillan & Co., London, 1:xvi + 503 pp., 18 maps and illustrations; 2:[x] + 607 pp., 9 maps and illustrations.

Wallace, A. R. 1880. *Island Life: or the phenomena and causes of insular faunas and floras including a revision and attempted solution of the problem of ecological climates.* MacMillan & Co., London, xvii + 526 pp., 26 maps and illustrations.

Woodford, C. M. 1890. *A Naturalist among the Head-Hunters, being an account of three visits to the Solomon Islands in the years 1886, 1887 and 1888.* George Philip & Son, London, xii + 249 pp., frontispiece + 15 pls, 3 maps.

Hands-on = Destruction?

The "fate" of the natural history collections at SEARCH

Some readers may already be familiar with SEARCH, Hampshire County Council Museums Service's hands-on centre for history and natural history, based in a former Grammar school building in Gosport. We opened officially in December 1995. After a development period of about three years, it is very pleasing to have all our hard work recognised. In our first year, we are joint winners of the Museum of the Year 1996 "Best Museum Education Initiative" and we have also been highly commended in the Gulbenkian Awards for Museums and Galleries' "Most Imaginative Education Work".

SEARCH for Science offers a hands-on experience through staff-led activity sessions with real (and a few replica) natural history specimens, and with scientific equipment such as video-microscopes. At present, our main audience is school children (aged 5-11), including special needs groups, though we have also hosted open days and very popular family hands-on days to link with National Science Week.

The primary worry of anyone who cares for the well-being of collections in museums, especially curators or keepers, is the potential damage caused by allowing the general public (especially children) to handle specimens directly. In almost three years of hands-on activities with children using a range of specimens in SEARCH for Science, this worry has turned out to be broadly unfounded. We predicted some damage, but in practice, it has been much less than expected.

In SEARCH for Science, virtually all of the 300 or so specimens used for handling are accessioned, either as part of our main collections or acquired and accessioned as "education" collections. Obviously all items have an intrinsic value as representative examples of natural science material. However, we feel that there is no reason why more important or delicate specimens cannot be used in SEARCH, we are just especially careful about how they are handled or displayed (see below). We consistently implement damage-limitation strategies in high risk areas. From our low damage incidence rate and zero "disappearance" rate (so far), we assume that these have been successful. I hope that these

notes may give some hints or encouragement to those of you out there who are tempted to try out some real hands-on activities in your venue!

Communication

- Tell people how important the collections are but make it clear they are trusted to handle things carefully. People (including children) respond to being treated with respect, and generally parents do keep an eye on what their children are doing.
- Instruct visitors on the correct way to handle the collections (eg two hands, one thing at a time) - this gives them the confidence to do it correctly. Address your remarks about handling to the parents or teachers as much as the children. Adults often know as little about care of objects as the children and value being given a *few* basic rules.
- Be vigilant - you can usually spot a potential ear-pull or feather-ruffle before it arises. The visitor in most cases doesn't damage specimens in a malicious way and will respond to a few reasoned words from a member of staff.

Presentation

- Ask visitors to wash or wipe their hands before handling - simple, but conveys the value of what they will be handling.
- Use specimens in very good condition - visitors will be less careful with items which are already damaged. Remove specimens as soon as you notice any damage, however small.
- Limit the numbers or circulation of visitors - if people feel crowded or rushed, they tend to handle more roughly.
- Provide equipment like video-microscopes or lenses to give some direction to observation and handling. When people know what they are doing and why, less damage occurs.

Limited access

Recognise that some items cannot be handled directly and think about alternatives:

- keep them out of reach but easily viewed
- present them in an accessible way, in transparent or glass-topped portable boxes

