



FLY TIMES

**Supplement 2,
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Welcome to the second Supplement issue of *Fly Times*! I am very pleased to have started this series, as it will facilitate distribution of larger works such as this one. Please let me encourage you to consider contributing to both the regular *Fly Times*, and if you are so inclined, to the *Fly Times* Supplement series. The *Fly Times* comes out twice a year – April and October (although usually late it seems!), while the Supplement can come out any time. Both this Supplement, and the first one in 2017, are historical in nature, focused on the life and times of dipterists of the past. Future Supplement issues can be historical like this one, or focused on any other dipterological topic, from original research, to travelogues and collecting adventures, to larger taxon-focused themes.

The electronic version of the *Fly Times* continues to be hosted on the North American Dipterists Society website at <http://www.nadsdiptera.org/News/FlyTimes/Flyhome.htm>, as is the *Fly Times* Supplement series. Also note, the *Directory of North American Dipterists* is constantly being updated. Please check your current entry and send all corrections (or new entries) to Jim O'Hara – see the form for this on the last page.

Issue No. 61 of the *Fly Times* will appear very soon, hopefully around the end of next month. Please send your contributions by email to the editor at stephen.gaimari@cdfa.ca.gov. All contributors for the next *Fly Times* should aim for mid October 2018 (maybe then I'll get an issue out actually on time!), but as usual, I will send a reminder. And articles after mid October are OK too! Articles for the *Fly Times* Supplement can be submitted at any time.

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The Life and Work of Francis Walker (1809–1874)

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“If the fame of Mr. Walker as a first-rate entomologist was not already firmly established, this work would secure it for him, replete, as it is, with valuable information, guarded by scientific accuracy.”

— Rev. F.O. Morris, 1856, reviewing volume III of *Insecta Britannica*

“But what arrogance to coin original forms, some of which sound like childish babbling and which offer so few clues for the memory that their creator himself must have forgotten them within the next quarter-of-an-hour, and to expect that lepidopterists should sanction such garbage!”

— P. Zeller, 1872, translation of a review of Walker’s Lepidoptera works.

1. Introduction

The diametrically opposed quotes above typify the irony of comments from colleagues with regard to the writings of British entomologist Francis Walker¹. It is odd indeed that someone who was kept in high esteem by one group of entomologists could be at the same time be vilified by others.

The Victorian era in Britain saw a dramatic rise in interest in natural history through collecting and/or purchase of specimens and the resultant beginnings of many entomological societies allowing a medium within which its members could gather, socialize, share anecdotes, and exchange observations with like-minded colleagues, as well as examine interesting recently collected specimens. At this same time, the collections of the British Museum were undergoing significant changes, both of size and quality with the construction of additions to and larger buildings at the Bloomsbury facility and the hiring of keepers and assistants for proper curation of its holdings. With continual and significant increases in its holdings of specimens and artifacts through the results of exploratory and scientific voyages and through donations and purchases from private collections, the task of taking inventory of the zoological specimens in the museum via “lists of specimens” and “catalogues²” became a necessary priority.

Francis Walker was one the early members of some of those first entomological societies and also one of the major contributors to the enormous task of inventorying and cataloguing the various orders of insects in the British Museum. During his career, my scouring his works page-by-page show that he described 23,626 species as new to science, almost 16,000 of them described during his cataloguing of the British Museum collections. Ohl (2018) calculated that he described about 560 species per year. He was one of the most prolific of describers in the history of entomology if not all of biology.

Although his membership in those early societies led the amicable and personable Walker to garner and keep many entomological friends for life, it was the cataloguing and prolific descriptions that was to be his professional nadir and the point of contention by many of his colleagues that much of what he had done was the source of a virtual taxonomic labyrinth that would take generations of entomologists more than a hundred years to navigate.

¹ A brief biography of Walker based on this more complete one was published by Evenhuis (2011).

² Because of the relative proclivity of the use of “catalogue” in this paper and knowing that American orthography differs slightly from the British [deleting the “-ue” ending]; to avoid confusion of usage and spelling differences, I use the British orthography throughout this paper while adhering to American orthography for the remainder of words, except those found in quotes. Additionally, for simplicity and following previous authors, I use the term “catalogue” in the narrative when referring to works in the Gray “catalogue” series, although three different types of publications (lists, catalogues, and nomenclators) comprise the series.

2. Background and Early Years¹

Francis Walker was born on Monday, 31 July 1809 at Arno's Grove, Southgate, Middlesex, a hundred-acre country estate of the Walker family approximately 8 km north of London in the woods and pastures of the Enfield area. He was the last-born of his siblings, which included 6 brothers and 3 sisters. His father, John Walker (1767–1824), mother Sara (née Chorley) Walker (1774–1852), and paternal grandmother Elizabeth (née Hill) Walker (1737–1795) were avid naturalists and it was almost certain that their interest had a profound influence on Francis as he was growing up. The relatively detailed (for the *Gentleman's Magazine*) obituary of Elizabeth Walker gives ample evidence that she was not just “interested” in natural history but was also a collector herself:

“Natural History was her favorite pursuit; the collections she had made in several of its branches will remain a testimony to her taste and partiality for investigating the productions, and carefully examining the operations of nature” (Anonymous, 1795: 83–84).

It was no doubt her collections that were mentioned by Brewer (1816) when he described the interior of the Arno's Grove mansion with its well displayed and scientifically labeled and curated collections of minerals and shells. The collection was mentioned in more detail by Bew (1820) in his “*The ambulator*”:

“... and the mineralogist has an equal treat of nearly 5000 specimens of choice minerals scientifically arranged: in an elegantly wrought cabinet of maple-wood is likewise a rich collection of scarce and estimable shells.” (Bew, 1820: 13).

His father, John Walker, was a member of the Royal Society, the Royal Horticultural Society, the Royal Society of Arts, and the Linnean Society, the last of which he was at one time vice president; and his mother was a patron (subscriber) of many natural history works of that period including John Curtis's *British entomology*. Edward Newman (1874), in his eloquent obituary of his close friend Francis Walker, said of the influence of John Walker's natural history interest on Francis: “his son's almost boyish propensity for studies, in which he afterwards became so eminent, seems to have been inherited rather than acquired.”

The Walkers were a well-to-do family with Quaker backgrounds². Francis Walker's grandfather Isaac Walker (1725–1804) was a wealthy wholesale exporter of foreign linens (especially German) printed in England and a member of the Society of Friends at Winchmore Hill in Enfield. He retired early, possibly around 1777, the year he purchased Arno's Grove, from a Mr. James Brown³. Brown had bought it from Lord Newhaven, who significantly improved it and gave it its name (Lysons, 1811: 178). Arno's Grove (originally Arnold's Grove; subsequently Arnos Grove, Northmet House, and now enlarged and encased in red brick as the Southgate Beaumont Care Center) was essentially the family's country estate. Francis Walker's father, who had lived in Upper Gower Street in London after his marriage to Sarah Chorley in 1793, succeeded to the ownership of Arno's Grove in 1804 upon the death of his father Isaac. While at Arno's Grove, John also kept a residence in London at 49 Bedford Square, the latter of which was frequently used by Francis from the 1830s to 1860s when he was in

¹ See Appendix II for a genealogy of the Walker -Ford families.

² One source (Southall, 1893: 41) gives a possible genealogical relation with the Harfords of Blaise Castle in Bristol, but my research of archives and correspondence has showed that only a common business interest transpired between John Scandrett Harford and Isaac Walker.

³ A note by William Curtis (1799: pl. 439) mentions Isaac Walker living in Southgate as early as 1771, but this may have been elsewhere than Arno's Grove.

London working on the insects at the nearby British Museum or those belonging to William Wilson Saunders. The Bedford Square residence was also, for many years, the home of the collections belonging to the Entomological Club, of which Walker was curator for a short time (South, 1892, 1899). Walker resigned his curatorial responsibilities in November 1852 owing to his having to briefly move away from that residence.

John Walker was a well known philanthropist. It was this generosity and also his mutual interest in affordable education for children and the poor that put him in association with social reformer Robert Owen; first as a friend, and later as a financial partner in Owens's New Lanark infant school (Graham, 1979). Owen's (1857) description of John Walker gives us a candid glimpse of the environment in which Francis Walker grew up:

“Mr. Walker was a most disinterested benevolent man, highly educated, possessing great taste in the arts, himself a superior amateur artist, well versed in the sciences, and a perfect gentleman, in mind, manner, and conduct, throughout his life. He had never been in any business, and was untainted with any of its deteriorating effects. He was born of wealthy parents, who were of the society of friends, but who under peculiar circumstances allowed him to go with and under the direction of a superior accomplished person, a friend of the family¹, to finish his education from the age of twelve at Rome, where he remained for several years, and made the best possible use of his time. He possessed a good town house in Bedford Square, and a superior country house, called Arno's Grove, the former residence of Lord Newberry [sic]. He had greatly improved it, had accumulated a greater variety of exotics in his pleasure ground, and had in his museum probably one of the choicest collections of specimens of various objects of natural history, that any private gentleman possessed. He was considered to be a member of the society of friends; but in his language, habits, and external appearances in dress and carriage, he could not be distinguished from others of his standing in society, except for his correct taste in all his arrangements and appointments.”

Francis Walker's early interest in entomology and ability of keen observation was kindled by his fascination with the habits of butterflies that came to feed on the plums and apricots of his father's gardens (Newman, 1874). Many of these early collections and observations were made with his brothers Henry and Edwin, the latter of whom is mentioned as the collector of beetles by Curtis (1824: pl. 11). Indeed, many of the early collections recorded by Walker in his publications were from his family's Arno's Grove residence in Southgate: either labeled as “Southgate” or, later, as “near London” (Graham, 1979).

The Arno's Grove estate (Fig. 1) was a broad expanse of neat, sheep-clipped lawns, greenery, and forest with the New River running through it. Annexed to the opulently appointed mansion (Fig. 2) were a number of hothouses that contained plants from all parts of the globe. A number of notes in British botanical journals of that era mention the first flowerings or fruitings of various exotic plants that were known only from the gardens of Isaac Walker and John Walker, the latter who often graciously supplied seeds of his plants to others². In his description of the mansion and estate, Brewer (1816: 709–711) summarized: “These premises afford a rich fund of enjoyment to the Naturalist.” In Francis Walker's later years, Arno's Grove was host to visiting cricketers as Walker's seven nephews, all sons of Walker's elder brother Isaac Walker (1794–1853), were famous cricketers, established a cricket ground on the estate, and endowed a cricket club there that still exists to this day (Bettesworth, 1900).

¹ This was probably John Walker's uncle, Thomas Ford Hill, who was a fairly well-known (at that time) author of classical and political works, traveled often to Italy, and died there in 1795.

² A note in the *Gentlemen's Magazine* for 1795 mentions that Isaac Walker's gardener won the silver cup for the “best melon” at the melon feast in Woodford that year.



Figures 1–2. Arno's Grove. 1. (top) Estate showing the varied environment surrounding it. 2. (bottom) House with immediate surrounding lawns and hothouse in the back at left.

Exposure to natural history outside of Britain was afforded to young Francis and his brothers when, from 1816 to 1820, they traveled with the family to Paris, visiting with author Madame de Stael in her last years when she was confined to her room due to illness, and then on to Switzerland, spending more

than a year in Geneva, then a center of literary *illuminati*, where they met such luminaries as Horace Bénédict de Saussure¹, author of “*Voyages dans les Alpes*”, and the poet Lord Bryon. In 1818, they stayed at a residence on the shores of Lake Lucerne and were visited by Robert Owen, who accompanied two of the Walker boys (possibly including Francis) to the top of Mt. Righi. Newman (1874) mentioned that, on this trip to Switzerland, Francis and his brother Henry also climbed Mt. Pilatus where they collected butterflies. In a letter to A.H. Haliday written on 17 July 1868, Francis Walker says of his boyhood experiences in Switzerland “It was here that I first felt the beauties of nature When I was a little boy I lodged for over a year in a wine grower’s house near Clarens on the lake of Geneva.” (Graham, 1979).

After his return to Arno’s Grove in 1820, and having been firmly bitten by the entomological “bug”, young Francis soon became interested in collecting and (according to specimens recorded in Curtis’s *British Entomology*), with his brothers Henry and Edwin, were making collections from the Southgate estate as early as 1823. Eventually, Francis started to specialize in parasitic Hymenoptera and in 1829 was a subscriber to Gravenhorst’s *Ichneumonologia Europaea*. By 1830 he had already acquired a substantial collection of parasitic Hymenoptera as was shown in a letter (now in the Oxford University Museum of Natural History Archives) of 1 March 1830 that John Curtis (1791–1862) had written to James Charles Dale (1791–1872):

“Mr. Walker finds he has 700 species of Diplolepidae² ... he has given me a vast quantity & some of them exquisitely beautiful” (Graham, 1979).

Further correspondence between Curtis and Dale indicates that sometime before December 1830 Curtis had spent time with Walker at the Bedford Square townhouse and at Arno’s Grove (possibly upon their return from a trip to France; see below) and examined Walker’s collection and found it to not only consist of British examples, but also extensive representatives of French and non-European material.

¹ This de Saussure was mistaken by Newman (1874) as the naturalist Henri de Saussure (1829–1905) who had not yet been born when the Walkers were in Switzerland.

² This means Chalcidoidea (Graham, 1979: 9)

3. Edward Newman, the Entomological Club, and Entomological Colleagues



Figure 3. John Curtis (1791–1862).

The year 1830 also saw Walker and his brother Henry traveling again in continental Europe, this time in France in the company of the well-known British entomologist John Curtis (1791–1862) (Fig. 3). The goals of the three were to obtain some satyrid butterflies as well as visit the fossil quarries at Aix-en-Provence. Aix-en-Provence was the locality from where some fossils derived that were given to Curtis by colleagues and had been described by him the year before. Along the way there and on their return they collected insects on the island of Jersey, and in France at Bordeaux, Fontainebleau, Montpellier, Lyons, Fréjus, and Nantes (Westwood, 1863; Newman, 1874). The final specimen total for the three collectors was a substantial collection of more than 6,000 specimens (Westwood, 1863).

Curtis was one of the many entomological friends that Walker would make in his travels inside and outside of Britain. However, it was another friend who would remain a close one to Francis for all of the rest of his life: Edward Newman (1801–1876) (Fig. 4). Newman, a devout Quaker, left school in 1817 to work with his father in the wool business at Godalming, approximately 25 km southwest of London, but was distracted by the strong force of the natural history of the surrounding area. Although working long daily hours at the wool business with his father, he was tremendously energetic and spent late nights with his natural history books and writings (initially on ferns but later insects). In 1826, the wool business was abandoned, and Newman went to London to enter the rope making business in Deptford. Although not an optimal site for a nature lover (Deptford was essentially the Naval ship-building yards for London), it still was closer to the city center than he had been before and allowed him to meet a number of scientists, either at meetings of the Linnean Society or at the British Museum. Some of these acquaintances turned out to have the same interests in entomology and botany as he did. While in Deptford, Newman met and became friends with the lepidopterist brothers Henry (1808–1875) and Edward Doubleday (1811–1849), naturalists John (ca. 1806–1851) and William Christy (1807–1839), algologist and paleontologist James Scott Bowerbank (1797–1877), and Francis Walker; the first four being fellow members of the Society of Friends¹ with Newman.

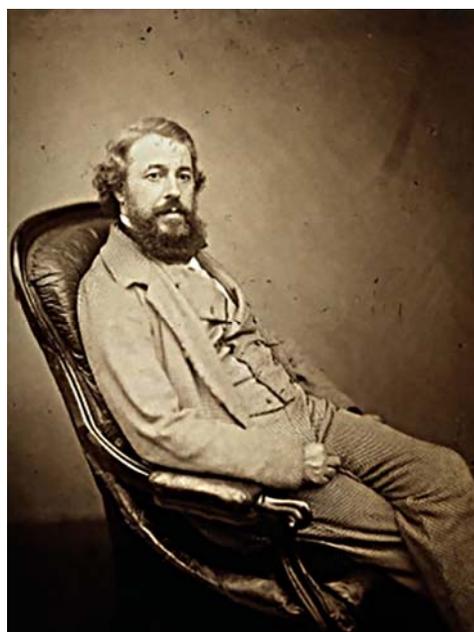


Figure 4. Edward Newman (1801–1876).

¹ Although Walker's grandfather Isaac was a Quaker, the family's adherence to Quaker dress and other distinguishing traditions and conventions were apparently relaxed with Walker's father John and no doubt other of Isaac's



Figure 5. George Samouelle (1798–1846).

More importantly, three other initial acquaintances that Newman had made during his years in Deptford ended up forming the original four members of the Entomological Club in 1826. These founding members were entomologist George Samouelle (1798–1846) (Fig. 5) [at the time working in the Zoology Department at the British Museum]; Abraham Hopkins Davis (1795–1866)¹ [a printer with the company Westley & Davis and entomological collecting companion of Samouelle]; Samuel Hanson (1804–1882)² [a tea-merchant and head of the company Hanson & Son and collecting companion of Samouelle]; and Newman. The group was a most amiable one, and the sole purpose of the Entomological Club was the social ambience of its members. They often met at the Bull Inn (Fig. 6), Birch-Wood Corner, Kent, or otherwise at each other's houses, to dine, wine, and (occasionally, if spending the whole day) to go on entomological excursions first and dine afterwards. Meetings at public houses or village inns was a way to be away from the workplace or homes and leisurely meet with colleagues where beverages were the social lubricant.

“The public-house is for the operative, what the public squares were for the ancients. It is where they meet one another, and where they discuss the topics in which they are interested. their meetings, whether permanent or accidental; their masonic lodges; their mutual aid societies; their clubs and secret societies, are all held in public-houses.” (Faucher, 1844: 52).

The fields and woods surrounding the Bull Inn were localities for collecting of Club members and other entomologists. Some of the results of collecting made it to the pages of Curtis's *British entomology* [e.g., founding Entomological Club member Samouelle collecting *Limenitis camilla* (Curtis, 1826: pl. 124)] as well as numerous other entomological works.

By 1831, the group decided to establish a quarterly journal (the *Entomological Magazine* which Newman would edit; the first issue came out in September 1832) and to increase the group in 1832 from its initial four to a total of eight; therewith adding Francis Walker, Quaker religious author William Bennett (1804–1873), John Curtis, and James Scott Bowerbank. It was then agreed that there

descendants. Some of Francis Walker's siblings married non-Quakers (which up until 1860 was cause for expulsion from the Society of Friends) and helped with funding the building of Christ Church and gave the land for St. John's Church. Francis Walker's son Francis Augustus Walker (1841–1905) and at least one brother-in-law became Anglican priests. Francis and at least one of Francis's daughters were members of the British and Foreign Bible Society and donated to it frequently.

¹ The printing and bookselling business of Westley & Davis (who printed the *Entomological Magazine*) declared bankruptcy in April 1837 (and the *Entomological Magazine* ceased publication the following year) and Davis emigrated to Australia, where he continued to collect specimens and donate them to the Entomological Club, and then eventually entered politics.

² Gilbert's (2005) history of the Entomological Club has Hanson emigrating to Australia in 1857. Genealogy records have him dying in Zurich in 1882.

should be no more than eight members and, although membership lists in subsequent years show many more than eight (e.g., see South, 1899), this limit on membership to eight exists to this day (Gilbert, 2005).



Figure 6. The Bull Inn, in Kent, where the original Entomological Club often met.

Given Walker's close ties with these entomological friends, it is no surprise that the *Entomological Magazine* (published from 1832–1838) served as a medium for virtually all of his early papers and notes during those years. It was in this journal that, in September 1832, Walker published his first paper: on British Chalcidites (Walker, 1832). During the relatively short 6-year life of the journal, Walker would publish in it some 848 new species in 39 papers and notes. This industriousness for describing large numbers of species in such a short amount of time would be a portent of things to come.

Newman was obviously a nexus of the social network that the Entomological Club provided to its members. His proclivity for extensive discourse on numerous and varied subjects through the use of his pen was evident in the number of notes and articles found on the pages of his journals; some with his name appended; others with pseudonyms. Newman used this device of pseudonyms to thereby “anonymously” entertain his readers as to the goings on of a number of his closest friends at the meetings of the Club. These antics are found in his articles entitled “*Colloquia entomologica*”, written as plays, with Edward Doubleday (as Erro), A.H. Davis (as Venator), Newman (as Entomophilus), and Francis Walker (as Ambulator¹; the pun not a coincidence). Often, Newman's script toys with puns and inside jokes that only those in the “inner circle” of Club members would understand. For example, Doubleday (“Erro” in these articles) would sometimes in reality sign his notes in the *Entomological Magazine* with the Greek symbol “Δ”. The others in the group would thus either refer to “D” or “DD”

¹ The pseudonym apparently became a nickname for Walker and one cartoon made by Newman (Fig. 7), and published by lepidopterist A.G. Butler, a vocal critic of Walker, is labeled “Ambulator”.

or “triangle” in the *Colloquia entomologica* when making a hidden association between the pseudonym and the real person.

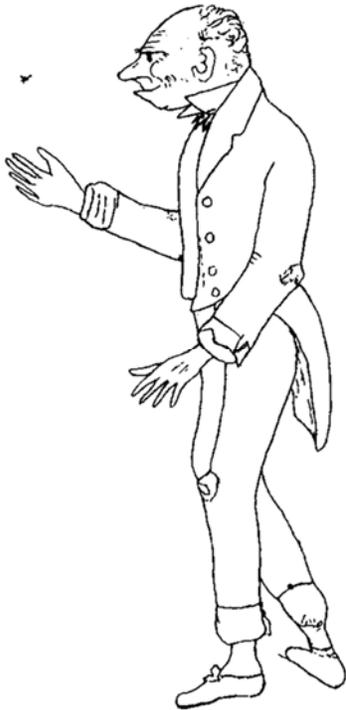


Figure 7. Walker, depicted in cartoon by Edward Newman as “Ambulator”.

Although universally regarded by his colleagues as a most generous and kind person, Francis was indeed not one to draw attention to himself socially, so that glimpses into his personality and doings are rare. These and other articles by Newman give us a precious few hints as to the life and times of Walker and his close associates.

Walker’s long and devoted association with the Entomological Club saw him appointed as curator of its collection in December 1849, upon the untimely death of its former curator, Edward Doubleday, due to a spinal tumor. Newman had lamented in a letter to fellow entomologist John Jenner Weir (1822–1894) that the organization of the collection was in a shambles and not much remained due to “generous disposition” of Doubleday: “he gave and lent to everyone whatever they asked of him” (Salmon *et al.*, 2000: 152).

The collection was moved to the Walker townhouse at Bedford Square where Walker wasted no time in commencing organization of the collection that was housed in two 40-drawer mahogany cabinets, and also improving it by adding specimens to it through his network of colleagues who donated material. On 16 May

1850 he gave the following report on its condition after only a short 5 months of work on it:

“I have nearly finished the arrangement of the Coleoptera, and have placed in the cabinets the Orthoptera, Neuroptera, Hymenoptera, Hemiptera, and that portion of the Diptera which were not previously arranged. I have commenced labelling the Lepidoptera which require particular rearrangement. I have transferred some duplicates and some exotic species from the cabinets to my own boxes, and will give them up as soon as required. In conclusion, I will remark that my correspondence with entomologists will enable me to add to the collection, and would suggest the purchase of “Curtis’s Guide” as a means of ascertaining the number of the species and probably of much increasing them.” (South, 1899: 225).

Walker continued his responsibility to the collections and adding to them until he formally resigned his curatorship in October 1852 owing to he and his family having to briefly move from London to Piercefield near Chepstow, Monmouthshire, in Wales. The Bedford Square townhouse (Fig. 8) remained in the Walker family during that time but he could no longer guarantee his being there often enough to ensure safe preservation of the Entomological Club’s collections under his care.



Figure 8. The 49, Bedford Square residence of the Walker family as it appears today, within a short walk of the British Museum in Bloomsbury.

4. Early Publications, Travel, and Family Life

Walker's first interest was parasitic Hymenoptera, but he also had an initial interest in Diptera, and these two became the primary subjects of his studies in the 1830s and 1840s. In 1839 he published 7 papers, all on Hymenoptera, including the finale to his *Monographia Chalciditum* series by completing a two-volume monograph of more than 400 pages devoted to a synopsis of the group that started his career in 1832. Some 603 new species were described by Walker on those pages.

Initially, Walker, like so many of his British colleagues, specialized in working primarily on British species. His first paper (Walker, 1832) pertained to mainly British parasitic Hymenoptera but it did include a few specimens from his collecting in France. This apparent obsession by British entomologists to be so provincial in their study was provocative enough that it captured the attention of entomologist H.T. Stainton (at one time editor of the *Entomologist's Weekly Intelligencer*), and his views were quoted by the botanist George Bentham in his annual address to the Linnean Society of London:

"I believe I do not at all exaggerate if I say that for many years Entomology was pursued in this country with an insularity and a narrow-mindedness of which a botanist can scarcely form a conception. The system of only collecting British Insects was pursued to such an extent, that it was almost a crime to have a non-British insect in one's possession; if accidentally placed in one's cabinet it might depreciate the value of the entire collection, for Mr. Samuel Stevens¹ can assure you that the value of the specimens depends very much upon their being indubitably and unmistakably British. A specimen caught in Kent which would fetch 2£. would not be worth 2s. if caught in Normandy. I satirised this practice several years since in the 'Entomologists' Weekly Intelligencer' (vol. v. and 1858, articles 'Jeddo' and 'Insularity'), but it is yet far from extinct." (Bentham, 1871: 194)

Walker's early papers did indeed focus for the most part upon the British species (and especially those he had collected at his boyhood home in Southgate as well as other parts of Britain) but, to be fair, his travels to the European continent allowed him to examine, compare, and describe non-British specimens in his articles as well.

One of those trips was to Norway. In the summer of 1836, a precocious young 20-year old naturalist named William Dawson Hooker² (1816–1840) organized a team of fellow naturalists to accompany him on an expedition—jokingly labeled by Hooker as a “summer vacation”—to Scandinavia. Walker was invited to join ornithologist Hooker and botanist (and fellow Entomological Club member) William Christy, Jr.³ on the three month trip to the northernmost parts of Norway (including Lapland, Alten, and Hammerfest) where it was said no scientist had been before. The three men, all in their twenties, enjoyed the nature and culture of the land of the fjords, and collected a diverse assemblage of plants and animals to bring back to England, while making notes on the landscapes of those foreign lands and the habits of its people.

In his book on the journey, Hooker (1837) gave a detailed daily account of the trip (which began on 26 June 1836 and returned to England in late August) and we there have the rare opportunity of reading of a few first-hand accounts of Walker's collecting and other adventures. Christy (1837) augmented

¹ Samuel Stevens acted as an agent for many collectors in selling zoological specimens to museums and private parties.

² Elder brother of the well-known botanist Joseph Dalton Hooker (1817–1911)

³ Christy unfortunately died three years after returning, from a lingering illness that caught him in the prime of his young life.

Hooker's words by giving an account from his own diary of the trip in the journal *Entomological Magazine*. Christy's version pertained mainly to the plants he encountered and collected, but also included many entomological observations based on Walker's notes.

The trip had both its ups and downs. For example, in one instance, while Hooker and Christy suffered the onslaughts of blood-thirsty boreal mosquitoes, Walker was observed to be nonchalantly "busy with his insect nets", apparently unaware of the mosquito problem befalling his comrades. During the expedition, Walker was able to procure many specimens of Diptera, Lepidoptera, and Chalcidae (Newman, 1874) but he also lost his bloodhound after it had run off to chase reindeer and could not be found despite diligent searching by all members of the expedition and did not return to the boat before they had to depart the area (Hooker, 1837).

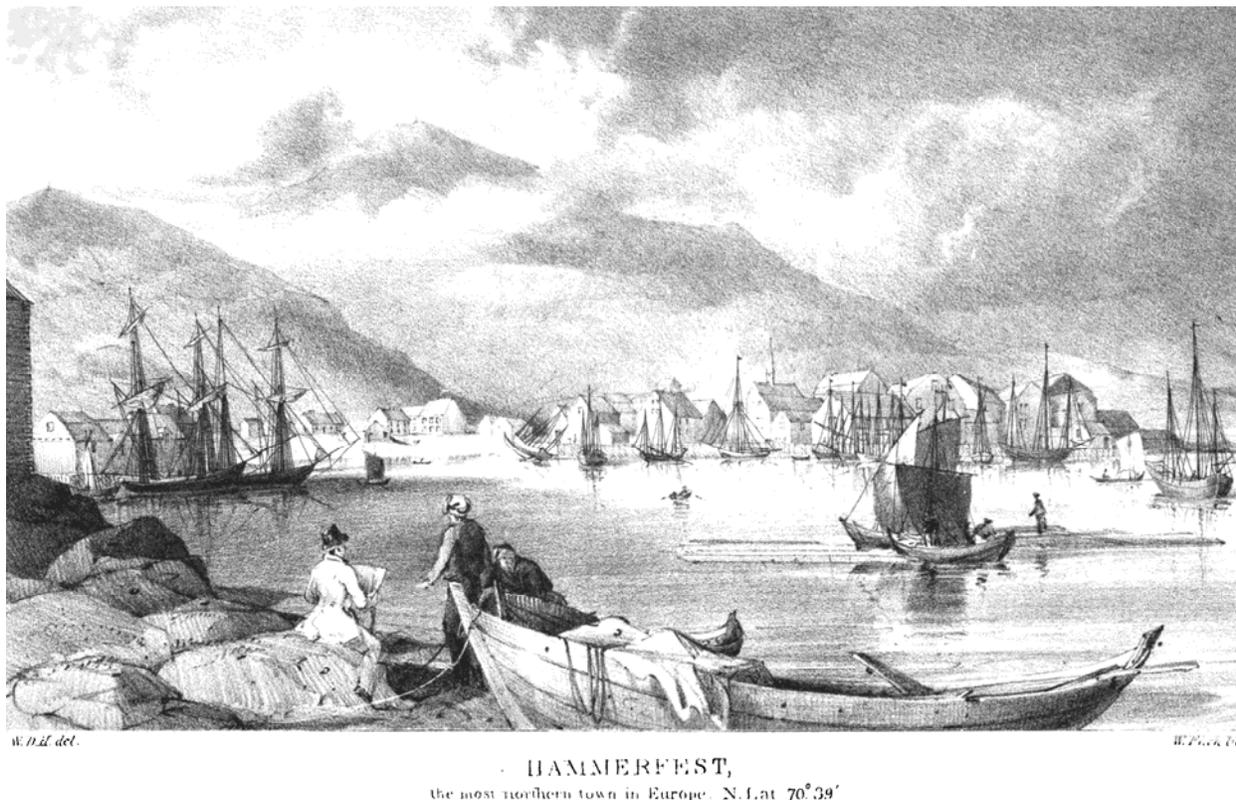
In one light-hearted account, Hooker (1837) related the ritual of bathing in their first experience in a sauna (called by Hooker a "Vapour bath"). Hooker and Walker individually entered the sauna after having to abandon their modesty and strip bare of their clothing in front of the attending women of whom Hooker says "took it quite unconcernedly, as a matter of course". It is not known what Walker's reaction was to his having to disrobe in front of the women, but the younger Hooker's was certainly one of embarrassment and disconcertment. Christy's (1837) account of the sauna is in more detail but written without much ado when explaining the requirement of having to remain unclothed until the perspiring subsided.

Hooker (1837) also gave a brief and general mention of the expedition participants shooting birds early in the trip, but Newman (1874) was more specific saying it was on this trip that "we have the first and only notice of [Walker's] prowess as a sportsman : he shot wild grouse and ptarmigan ; and on one solitary occasion was accessory to the death of a reindeer." There is also mention by Hooker of the expedition members, while biding their time during an otherwise boring period at sea, taking turns shooting empty claret bottles for fun; and, another anecdote when, after arriving in a village one fine and clear Sunday, all members of the party politely attending a Norwegian church service, although no one understood a word of what was being said.

Christy's (1837) account interestingly goes into more detail than Hooker as to the many nightly parties and balls that the three gentleman attended or even hosted. Mention is also made repeatedly concerning the Norwegian ladies who were at varying times their dance partners, suppliers of food during and after their collecting adventures, and sauna attendants. All three men were bachelors at the time so the company of these ladies could well have been very impressionable. So much so for Christy (1837: 468) that he quoted a friend with regard to their beauty: "the ladies of Norway are decidedly worthy the attention of the naturalist."

After spending two months collecting and adventuring in the far north of Scandinavia, the expedition team on 17 August 1836 made ready to return to England, but were surprised to find out at the last minute that the rather independent Walker decided to forego returning by boat with the original party and instead decided to return with a few others overland via a separate route through Torneö and Stockholm in Sweden. Although this was possibly a more arduous route through mountain passes, Walker's decision turned out to be serendipitous as those who decided to return by boat encountered a violent storm soon after departing and lost many of the collections that they had worked so hard to obtain, including the unfortunate death of four reindeer they had hoped to bring back to England. In addition, many of Hooker's original sketches (who was an accomplished artist) made during the journey were ruined but a few survived and accompanied the text of his travelogue (e.g., see Fig. 9).

Walker's material survived and was treated by he and others in subsequent publications (e.g., Haliday, 1841; Walker, 1844d, 1844e; McLachlan, 1899).



HAMMERFEST,
the most northern town in Europe. N. Lat 70° 39'

Figure 9. Scene of Hammerfest, Norway, at the start of the Scandinavian trip. Sketch drawn by William Dawson Hooker.

Four years after his Norwegian adventure, in May 1840, Francis Walker married his second cousin, Mary Elizabeth Ford (1814–1878), the eldest daughter of John and Elizabeth Ford (née Lawson) of Ellell Hall in Lancashire. The marriage to Mary saw Walker moving out of Arno's Grove and into a nearby area of Southgate where he resided at a place called "Grove Cottage" (Fig. 10). Graham (1979) calculated that Walker may have moved into Grove Cottage in "March or early April 1841" [sic; no doubt meaning "1840"] and quoted a letter from Walker to Haliday of 29 April 1840 that states: "I have taken a lease of a cottage close by my native home". However, an earlier letter (6 July 1838) from Walker to Charles Darwin (see Burkhardt & Smith, 1987) is signed "Grove Cottage, Southgate", so he was there well before he married. As Graham (1979: 14) indicated, the home, also called "The Hermitage", belonged to Francis's elder brother, John, so the 1838 letter may have been written while Francis was staying as a guest of his brother. Graham (1979) mentioned Grove Cottage as "A thatched cottage which stands on the east side of Cannon Hill near its junction with Alderman's Hill, and quite near Arno's Grove". It still existed in 1979 when Graham visited the site. Although the cottage in Figure 10 appears substantial, Walker indicated in a letter to J.C. Dale that the house was not good for his collections:

"My habitation like yours is in a clay-soil, & some of my insects are occasionally mouldy, but not to any extent tho' I have not space for many of them in a room with a fire, but I hope to make another arrangement in this respect when I change my residence." (*F. Walker letter to J.C. Dale, 27 December 1847, Oxford Museum Archives, Dale MS 9, Entomological letter Book, Vol. 2, L-Z*).



Figure 10. Grove Cottage in 1900.

The year 1840 marked a hiatus in Walker’s rather frequent publishing, and this was no doubt due to his marriage and devotion to family. However, according to Newman (1874), in the summer of 1840 Walker was on the continent, collecting in Switzerland—possibly an “entomologist’s” honeymoon? In addition to the gap in Walker’s publishing in 1840, family life apparently had an influence on his descriptive work the following year as well, as 1841 saw him publishing primarily small observational notes and only a few descriptions of new species.

The Walkers had five children¹, the first, a son, Francis Augustus Walker (1841–1905); and then four daughters: Maria Edith Walker (1843–1938), Lydia Blanche Walker (1846–1918), Geraldine Walker (1847–1878), and Rosa Bertha Walker (1852–1900). His family duties apparently kept him from his travels for the first few years of his marriage.

His travels to collect may have ceased during this period, but after 1841, the self-imposed travel moratorium apparently did not slow his publication of notes and articles on various insects. However, instead of basing his descriptions of new taxa on his own collections, he now turned to publishing papers on new species based on the collections of others. For example, papers based on the collections of Charles Darwin from South America predominate in 1842 and 1843 (e.g., Walker, 1842a, 1842b; 1843a, 1843b, 1843c, 1843d, 1843e). Walker’s study of them began a few years before his marriage as is evidenced from correspondence with Darwin on the subject of his specimens sent to him for examination, but it seems from the letter (below) he was reluctant at that time to immediately delve into this South American material. This reluctance could well have been because working on Darwin’s

¹ One child, Geraldine, does not show up in British census lists until 1871 because previously she was institutionalized in Bath and labeled as an “imbecile” [at that time meaning a person of mental or moral deficiency]. Records have her living at Elm Hall until 1878, when she and her mother both passed away.

specimens marked one of the few times in the early years of his career that Walker would be examining specimens of insects from outside of Britain or Western Europe. Indeed, his remarks to Darwin make reference to how Darwin's exotic specimens compared to British species, which was his limited area of expertise at that time for Hymenoptera:

“I have been too dilatory in answering your kind letter. I am much obliged for your suggestions respecting the deficiencies in my indications of the localities of the species. I wish much to supply these & other imperfections in my descriptions, but I cannot venture to publish on the Chalcidites at my own expense, & the subject is too unpopular to be readily received into periodical works. As soon as I have leisure I will obtain the loan of your Specimens, & answer your queries fully. Meanwhile I will just state that with few exceptions the Chalcidites of S. America, & also those of Australia are remarkably like the European species, many of them are very nearly allied to the British species, & 2 or 3 are absolutely identical with the latter.” (*F. Walker letter to C. Darwin, 6 July 1838; from Burkhardt & Smith, 1987*).

Interestingly, his eventual publications on these specimens from Darwin in the late 1830s and 1840s show no evidence of any to be allied to European or British species. All those listed in his publications were described as new, including descriptions of some new genera.

Additional papers by Walker on these parasitic Hymenoptera that were collected by others include those collected by Rev. Lansdown Guilding from St. Vincent's Isle in the West Indies (Walker, 1843f), Edward Doubleday and Robert Foster from St. John's Bluff, Florida (Walker, 1843g) and George Barnston (Walker, 1844a) from North America.

The year 1844 saw him start once again working on his series of papers on British Chalcidites (i.e., Walker, 1844b, 1844c) that he had suspended in 1839. Walker was slowly getting back into the thick of things taxonomic again. Then, in a letter to J.C. Dale in 1847, Walker confides:

“I find that my income and my young family will not allow me to work at natural history for nothing, and I must endeavour to turn my publications to account, & make a profit by describing insects with their relation to plants¹, & also find a situation such as Curator to some Museum. If you should hear of any vacancy in any such institution, I shall be much obliged if you if you will inform me of it.” (*F. Walker letter to J.C. Dale, 10 March 1847, Oxford Museum Archives, Dale MS 9, Entomological letter Book, Vol. 2, L-Z*).

A similar lament is found in a much later letter from Walker to Prof. Frederick McCoy, Director of the National Museum of Victoria, during the time Walker was consigned to purchase insects for that museum (see below for details on these purchases):

“... tho' I am not as fully dependent on Nat. Hist. as a profession yet family matters require that I should have a consideration of employment therein.” (*F. Walker letter to F. McCoy, 23 July 1863, Museum of Victoria, Melbourne*).

Despite the fact that Britain was engulfed in an economic depression in 1847 and 1848 (the actual bank “panic” of 1847 did not begin until October of that year), these letters are unusual in a number of respects. Walker's public records show he was not in the least destitute (unless he ran into a bad spot income-wise from his annuity).² Regarding looking for a curator position, he had apparently already

¹ In the same letter, Walker tells Dale of a proposed pricing scheme for the sale of his papers. Thus, this lament might have been a polite way of explaining his wanting to sell Dale some of these papers, which he did indeed buy.

² The results of Walker's probate in 1875 after his death showed his possessions to be assessed at “not less than £45,000” (which is equal to over \$3 million in today's U.S. currency). However, the birth of their daughter Geraldine was in early 1847 and archival records indicate she was soon sent away to Bath to a school for idiots

been working on cataloguing the insects in the British Museum, i.e., the first of a two-part list of the hymenopterous insects (chalcids) was published in Walker (1846) and mentioned by Gray when he approached the Museum Trustees to employ Walker (see more details below); although he apparently did the first few catalogues for free¹. Family needs may have been a reason as he implies restrictions on expenditures in an earlier letter to Dale:

“I have heard from Haliday of Rondani’s Works, & I should like to peruse them, but I have stopped buying books on Ent.^{gy} since I have had family to attend to.” (*F. Walker letter to J.C. Dale, 12 December 1846, Oxford Museum Archives, Dale MS 9, Entomological Letter Book, Vol. 2, L–Z*).

The fact remains, however, that Walker was indeed seeking employment, as a letter in December 1849 to J.C. Dale proves (Fig. 11). A few days before Walker wrote the letter, lepidopterist Edward

Doubleday died from a spinal tumor leaving his position vacant at the British Museum.

Grove Cottage
Southgate
Dec. 25-49

My dear Sir,

Having been informed that I should not delay if I wish to renew my application for the office now vacant in the Brit. Mus. I shall be much obliged to you for the favor of your

“Having been informed that I should not delay if I wish to renew my application for the office now vacant in the Brit. Mus.^m I shall be much obliged to you for your testimonial in case you think me a fit person for that situation.” (*F. Walker letter to J.C. Dale, 25 December 1849, Oxford Museum Archives, Dale MS 9, Entomological letter Book Vol. 2, L–Z*).

Walker dutifully applied and waited a couple of months for word. However, he did not get the position. It was filled instead by Frederick Smith, who ended up working primarily on Hymenoptera.

In any case, it was in 1850² that Walker left Southgate and moved into Ellell Hall in Lancashire, the former home of Francis Walker’s wife, Mary Elizabeth, and at the time, with her brother, William Ford, the county magistrate, who had been living alone there. The family stayed there for at least two

Figure 11 (left). First page of letter of 25 December 1849 from Walker to J.C. Dale stating his wanting to apply for an open position at the British Museum and was requesting a letter of reference from Dale. Oxford Museum Archives.

and imbeciles. It could have been the unforeseen cost of this and/or added costs of child care that caused him to initially seek additional funds.

¹ Baker (1996: 396) indicated that the arrangement of payment to Walker for his work on the catalogues was approved by the British Museum Trustees on 10 June 1848.

² A letter from Walker to J.C. Dale of 23 Nov 1847 has Walker at Ellell Hall (Oxford Museum Archives), but this was during a visit to his wife’s family as he says in the same letter that he is returning to Grove Cottage “in a few days”.

years (census and other public records have them there in 1852, the year of the birth of their last child, Rosa Bertha Walker)¹. For about a year starting in October 1852, the family resided at Piercefield, Chepstow, in Monmouthshire, Wales².

The 3,000-acre Piercefield estate (Fig. 12) was very similar to Walker's boyhood home of Arno's Grove with an opulent mansion possessing wide sweeping vistas across neatly clipped lawns and meadows that are surrounded by thick woodlands and bordered on the west by the River Wye. Coxe (1801) described the area:

"In passing through the grounds the eye is charmed with the diversity of scenery; hill and dale, woodlands and lawns, venerable groves of oak, elm, beech, and chestnut, stupendous rocks crowned with ivy and underwood, form a striking assemblage, and prepare the traveller for the beauties of Piercefield." (Coxe, 1801: 397).

Although he was only at Piercefield for a short time (possibly leasing since the estate was in between owners at the time), Walker wasted no time in entomologizing the area and was able to collect a number of different arthropods, some of which were treated in subsequent studies, especially the spiders (e.g., Blackwall, 1854, 1861; Walker, 1855).

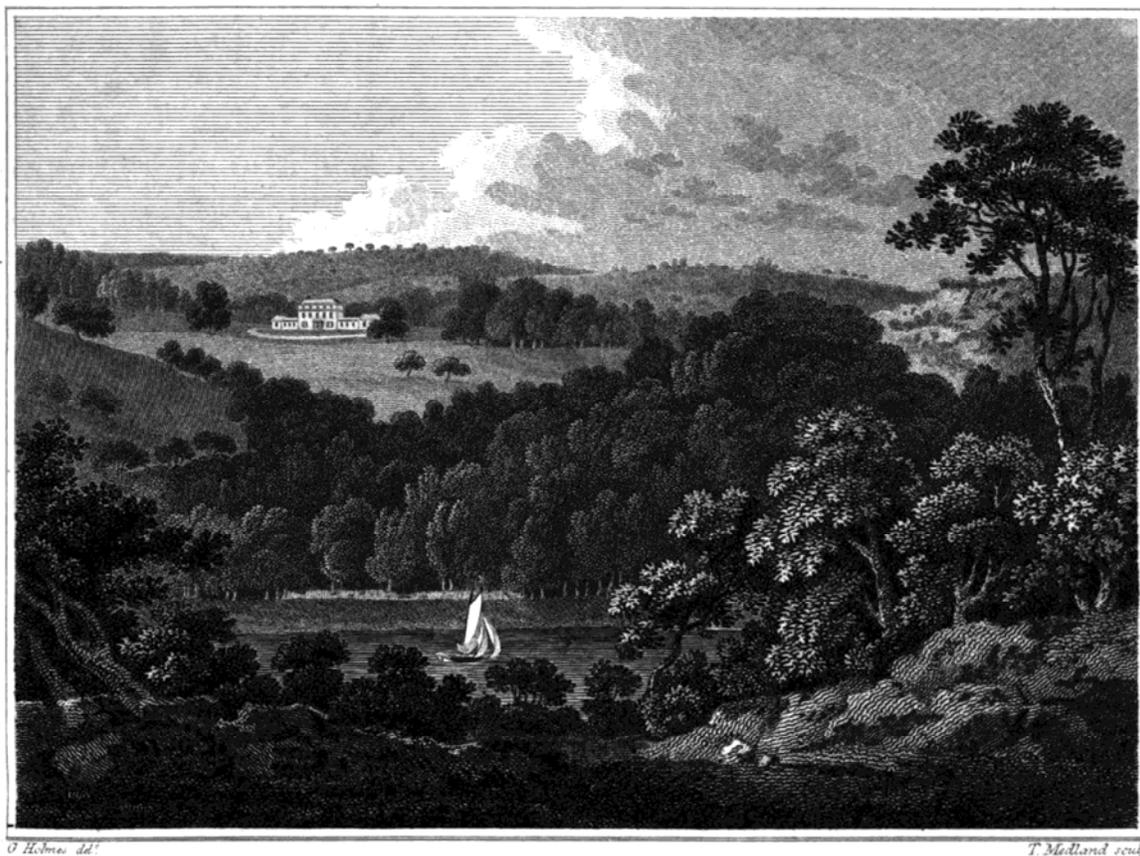


Figure 12. Piercefield in Chepstow, showing the surrounding environment.

¹ Correspondence with J.C. Dale indicates that Walker (and possibly also some of his family) stayed at their Bedford Square townhouse for a few months in 1850 and then returned to Ellell Hall.

² This temporary move may have been to have the family closer to Bath, where their daughter Geraldine was sent for special care.

In late 1853, the family moved to back to Middlesex, to the village of The Grove in Highgate¹, where they lived in the rectory house of St. Michael's church just outside of the village proper (the British census of 1861 records the whole family there [except Geraldine]). Graham (1979: 15) implied that Walker's move away from Southgate was connected somehow with mourning the death of his mother, who succumbed to injuries sustained in a fire in 1852, but I could find no such connection since he left Southgate for Lancashire at least two years before she died.

Walker was in Highgate at least to 1861 and records also have him staying at the family's Bedford Square townhouse during those same years, no doubt while he was working in London at the British Museum in Bloomsbury, only a few blocks away. The Walker family resided in only two other homes after that; from 1862 to 1866 they were at Church End, Finchley; and from June 1866 till after the death of Francis in October 1874 they were at Elm Hall, Wanstead (Fig. 13). After his death, his son the Rev. Francis Augustus Walker, moved with his family into Elm Hall, and they took care of Walker's widow and daughters for a few more years until Francis's widowed wife, Mary Elizabeth, passed away in 1878.



Figure 13. Elm Hall in Wanstead.

¹ This time of move and place of residence was determined by society membership listings as well as his correspondence with colleagues.

5. Cataloguing the British Museum Insect Collections: the Good and the Bad

Shortly after Francis Walker passed away in 1874, one of the most infamous of obituaries of all time appeared on the pages of *The Entomologist's Monthly Magazine*.

“More than twenty years too late for his scientific reputation, and after having done an amount of injury to entomology almost inconceivable in its immensity, Francis Walker has passed from among us.” (Carrington, 1874: 140).

Originally an anonymous piece, bibliographers were eventually able to trace the authorship to John Thomas Carrington (1846–1908). Carrington was an amateur lepidopterist who, until 1876 when he took over the editorship of *The Entomologist* upon the death of its founding editor Edward Newman, was little-known outside of a few of his friends in Scotland and readers of *The Entomologist's Monthly Magazine*, where he had previously published a dozen or so small observational notes on Lepidoptera. That Walker had affected this man so negatively speaks volumes for how he was viewed among his better-known contemporaries toward the later years of his life.

The reason for this breach of the normal etiquette of “*de mortuis nil nisi bonum*” [never speak ill of the dead] was the cataloguing efforts of Walker, the results of which had upset a number of taxonomists of his day. The single sentence in 1961 of British Museum Keeper of Entomology William Edward China (1895–1979) is not only indicative of how many viewed Walker's taxonomy during the 100 years previous to the 1961 statement but were to presage the feelings of many taxonomists for many years thereafter:

“Walker's name has come to be a by-word amongst insect taxonomists for his inaccuracy and superficiality.” (China *in* Doncaster, 1961: v).

In 1846, the indefatigable Francis Walker began an enormous task that filled virtually the rest of his life: a taxonomic inventory of almost all the specimens of insects in the British Museum. These works by Walker, with titles such as “*Catalogues of ...*” or “*List of the Specimens of ...*” and spanning all the orders of insects (except portions of the Hymenoptera and Lepidoptera, and all of the Coleoptera), were more than mere lists. Each was an orderly inventory of all the specimens contained in the collections of the British Museum, and were done as taxonomic syntheses where the main literature sources for described species were presented, synonymies were listed for described species, keys to genera (and sometimes species) were given diagnosing almost all the species listed, and specimens unknown to the author were described in detail¹. Spanning the years 1846–1873, Walker's catalogues comprise 67 tiny duodecimo-sized, blue-wrapped volumes (cf. Fig. 14) of almost 17,000 pages containing listings, descriptions, and diagnoses of more than 46,000 species, of which close to 16,000 species were described as new (see Table 1).

Cataloguing the Museum's specimens was not Walker's idea. This grandiose plan was the brainchild of the Keeper of Zoology at the British Museum, John Edward Gray (1800–1875) (Fig. 15). Gray, originally trained in medicine and having an initial interest in botany, was appointed assistant keeper in the Zoology Department² at the British Museum in 1824 and, with the support and encouragement of the Museum's former Keeper of Zoology, Dr. William Elford Leach (1790–1836), began the study and

¹ Although, despite the detail, these descriptions were still thought by some subsequent workers to be completely useless (e.g., Crosskey, 1974).

² Entomology did not have a separate department until 1913.



Figure 14. The Lepidoptera volumes of the British Museum catalogues. Bishop Museum Library.

organization of zoological specimens in the collection. After almost 20 years of energetic work curating the collections and making order out of chaos, in 1840 Gray succeeded Leach's successor, John George Children (1777–1852)¹ (Fig. 16) as Keeper of Zoology. He remained in that position until late 1874, when illness prevented him from further supervisory work and he retired, just a few months before he died. During Gray's tenure, the Museum's insect collections saw one of their greatest increases in numbers, mainly through donations and purchases. Gray's past work experience as an assistant keeper assured the museum Trustees that he was the one who would help bring order to these burgeoning collections.

In the years while the Museum was located at Bloomsbury and when Walker worked on them, the insect collections were all contained in a single room on the ground floor called the "Insect Room" (Fig. 17) next to what was called the "Arched Library". Stearn (1998) described the working environment of the Insect Room as:

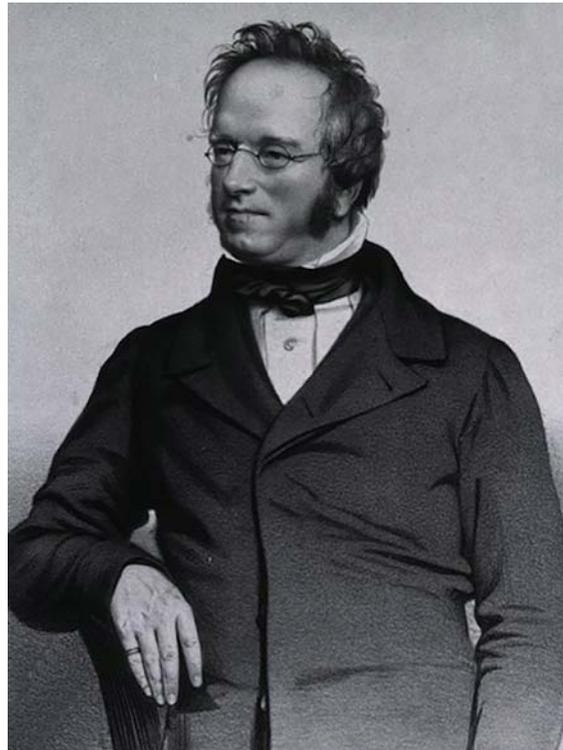


Figure 15. John Edward Gray (1800–1875).

¹ Children was initially appointed as Librarian in the Department of Antiquities at the British Museum in 1816 but was transferred in 1823 to the Natural history department and, in 1837, to the newly formed Zoology Department, the last move as its Keeper (Neave, 1933).

“... a well-lighted apartment fifty feet by thirty feet, in which the cabinets were arranged along the walls or in rows intersecting the room, so as to divide it into several partitions, the twenty-drawer cabinets, of which eight or ten were supplied each year, being piled on the top of the old ones almost to the ceiling” (Stearn, 1998: 205).

Although said to be cramped and dingy by some critics who pleaded for more space, it was not only the place for study of the museum’s insects, but also a gathering place for virtually every entomologist in the London area in those days and was the focal point for some famous meetings:

“After my return from the Amazon in 1852, I was, in 1854, preparing for my visit to the Malay Archipelago by a study of the insects and birds of that region, when one day, I think very early in the year, I was introduced to Darwin in the Insect-room of the British Museum, and had a few minutes’ conversation with him ...” (Wallace, 1903: 78).

In contrast to Stearn’s (1998) upbeat description of a well-lit room, Sclater’s (1877) was a mournful one:

“Two small studies partitioned off to the left are assigned to the Keeper of the department and his first assistant. The remaining naturalists are herded together in one apartment commonly called the “Insect-room”, along with artists, messengers and servants. into this room is shown everybody who has business in the Zoological Department of the British Museum, whether he comes as a student to examine the collection, or as a tradesman to settle an account. Amid the perpetual interruption thus caused, our national zoologist has to pursue his work. ... The library attached to the department contains merely some of the most obvious books of reference; all others have to be obtained on loan from the great national deposit of books in the centre of the building. No lights are allowed, and when the fogs of winter set in the obscurity is such that it is difficult to see any object requiring minute examination.” (Sclater, 1877: 541).

It was the only place that the zoological staff could perform any curatorial work and, during the period of “cataloguing”, it often contained a number of staff all crammed into small spaces. When a person did not have a desk, they sat on the ground with a board on their lap and conducted their writing of the “Lists” and “Catalogues”. In his obituary of C.O. Waterhouse, Distant (1917) recalled the room in 1869 when he first met Walker:

“Many of us still remember the former entomological sanctuary, which was then occupied by A.G. Butler who worked at the Lepidoptera and had charge of several other orders of insects, our late friend [Waterhouse] was custodian to the Coleoptera; Fredk. Smith studied and arranged the Hymenoptera, while the spare Dickensian figure of Fras. Walker was to be seen engaged in his encyclopaedic attempts to catalogue and describe beyond the capacity of any single entomologist.” (Distant, 1917: 71).

It was under these conditions that Francis Walker was contracted to catalogue the thousands of specimens of insects in the museum’s collections.



Figure 16. John George Children (1777–1852).

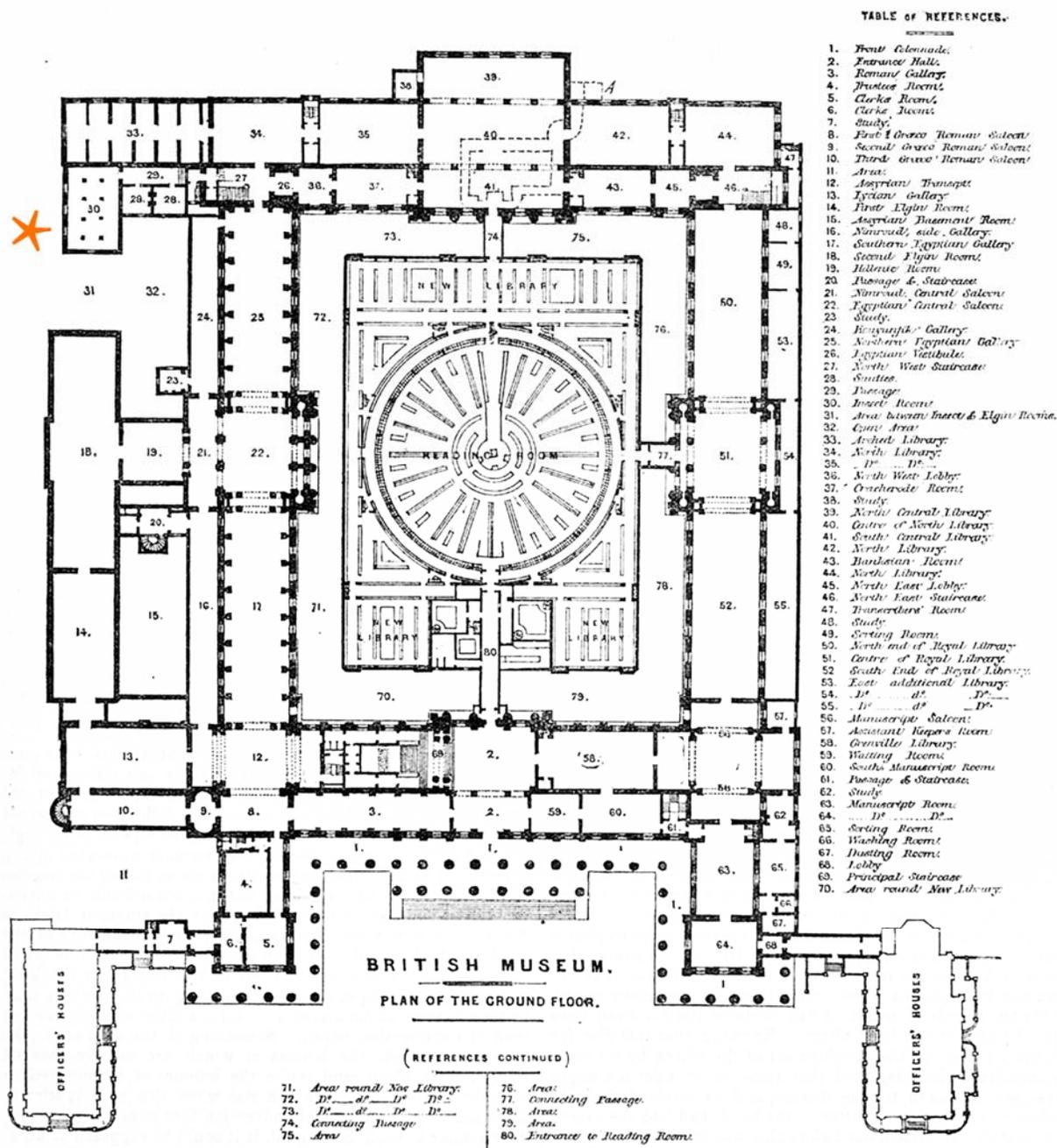


Figure 17. Plan of the ground floor of the British Museum in Bloomsbury in 1850 showing the “Insect Room” in the top left (marked with an orange asterisk).

In 1841, the galleries opened at Bloomsbury and displays of the museum’s collections were open to the public. During the mid-18th century, it was common for natural history museums to display all of their collections in the galleries. However, Gray thought differently. He separated the insect collections into two: those for exhibit displays and those for study. A guide to London in 1850 gave the following description of the zoological display collections in the gallery that were at that time housed in “Room IV”, which contained, among other curiosities, the “Annulose Animals” [= insects and other arthropods and annelid worms]. The study collection was termed the “general collection”:

“The wall-cases contain the collection of Fish, and the table-cases a few specimens of Annulose Animals, to exhibit their systematic arrangement. The general collection of Insects and Crustacea are preserved in cabinets. They may be seen by persons wishing to consult them for the purpose of study (by application to the Keeper of the Zoological Collection) every Tuesday and Thursday. To prevent disappointment, it is requested that persons wishing to see these collections will apply two days previous to their intended visit”¹ (Cunningham, 1850: 80–81).

However, the transfer of all of the zoological collections into these two series (exhibit and study) did not happen all at once. Günther’s (1916) history of the collections mentioned that as late as 1858, in an annual document to Parliament, Gray had reported that the formation of these two series was still in progress. In doing so, Gray reserved almost all of the insect collection for study in his “general collection”. Only the most showy of them were placed in display cases.

At this time, and because of the ever-increasing size of the collections at the British Museum, the cost-minded Trustees became interested more in filling gaps in the collection rather than indiscriminant purchases of whatever specimen came upon the market. To allow efficient selection of specimens to make the collections more complete, the Trustees at first directed that cheaply made “Synopses” of each collection be made and published and available to the public for a nominal fee (Miller, 1973; Thomas, 2012). The first of these to include natural history items was published in 1841² (British Museum, 1841) and contained brief descriptions written by Gray of each class and order of zoological curiosities in the collection, but it was not in any way a full inventory.

But this was not enough for Gray. The British Museum was not well thought of by the major museums in continental Europe and donors within Britain were neglecting the British Museum upon hearing complaints that the zoological collections were in a deplorable condition (Miller, 1973) and in disarray. Günther (1916) gave one example summarizing the condition:

“With regard to Insects, nothing approaching a complete systematic representation of the higher groups was attempted.” (Günther, 1916: 3).

In order to place the British Museum among the top museums in the world and at the same time allay the fears of potential donors, Gray wanted more detail in the descriptions of the holdings by more specifically showing what specimens they had in their collections. If more detail could be put into such lists of holdings, this could not only serve as a more accurate “guide” for visitors, but also act as a bellwether as to what the needs were of particular collections and better inform the purchase by Museum authorities of specimens to fill those gaps. Concurrently, such catalogues would serve to help organize the otherwise haphazard collection of invertebrates. Gray was able to convince the Trustees to subsidize a more detailed account of what the Museum currently contained but he had to be careful to produce them in an inexpensive format so as to not materially add to the annual expenditure of the department and to be able to distribute freely to zoologists and other museums (Günther, 1916). The Museum’s “Guides” continued to be published for the public, but Gray would only write elementary information for them, concentrating of his efforts in the preparation and publication of his “catalogues”. Three types of these catalogues existed and were described in a report on the museum’s collections given to parliament in 1849:

“... the *catalogues* are the most complete works, containing the character of the class, order, families, genera and species, with their synonyma, and references to figures, an account of all the specimens of each species in

¹ This quote as to making appointments was originally written by Gray in 1841 for the *Synopsis (q.v.)*.

² Gray wrote the sections on natural history collections (pp. 19–162).

the Museum collection, and a reference to the collection where the species which are wanting to the Museum, are to be seen. These catalogues are composed after the plan of the most approved botanical works, and are the only general zoological works of the kind in the English language; and Mr. Gray hopes that in time there may be such a work describing each part of the zoological collection, so as to afford the visitors a description of each species known, and to give travellers and persons in the country a zoological manual.

The *Lists* may be considered as the forerunners of the catalogues, containing only the names of the species, &c, without the characters or descriptions. [Most of Walker's "lists" are actually as detailed as the catalogues and contain numerous descriptions and synonyms].

The *Nomenclatures* are the least perfect of the series, being merely lists of the species, with only a few synonyma; they are useful as indicating the contents of the collection, shewing its desiderata, and serving to label the cabinets; but they, like the lists and catalogues, require considerable research and critical knowledge of the subject." (Anonymous, 1850: 547)

Once these catalogues started appearing in print, they soon gathered high praise from the public:

"It is to him [Gray] that the Public owe the admirable helps to the study of natural history which have been afforded by the series of inventories, guides, and nomenclators, the publication of which began, at his instance, in the year 1844, and has been unceasingly pursued. A mere list of the various printed synopses which have grown out of Dr. Gray's suggestion of 1844 would fill many such pages as that which the reader has now before him. The consequence is, that in no department of the Museum can the student, as yet, economise his time as he can economise it in the Natural-History Department. *Printed*, not *Manuscript*, Catalogues mean time saved; disappointment avoided; study fructified. No literary labour brings so little of credit as does the work of the Catalogue-maker. None better deserves the gratitude of scholars, as well as of the general mass of visitors." (Edwards, 1870: 578).

By 1849, the systematic organization of the zoological collections and the publication of his catalogues had caused a turnaround in how donors evaluated the museum, as indicated in an annual report to Parliament:

"Mr. Gray begs to observe, that he regards the fact of the same *donors* having repeatedly presented specimens, as a proof that they are satisfied with the manner in which their presents are preserved and displayed." (Anonymous, 1850: 544).

However, complications arose early on when the museum administration made it clear in the mid-1840s that they would not hire any further staff to assist Gray in curating the growing collections or in writing the catalogues. Instead, they requested that he contract outside specialists to take on the task of cataloguing the growing collections. Gray's staff at that time consisted only of two paid museum employees: Adam White (1817–1879) (Fig. 18) and Edward Doubleday. Once cataloging commenced, Doubleday immediately (1844) began cataloguing the Lepidoptera, and White was given responsibility for cataloguing the Coleoptera.



Figure 18. Adam White (1817–1879).

However, another experienced taxonomist was already in Gray's midst, and it was an easy decision to make: to contract Francis Walker to help with the remainder of the insects. As mentioned earlier, the independently wealthy Walker began the work on cataloguing in 1846 for no pay. It was not until June 1847 that Gray approached Walker to work up the Diptera catalogues with remuneration for his efforts.

While Walker was working on the second part of the Hymenoptera catalogue (on "Chalcidites"), Gray, having noticed Walker's industriousness, approached him to see if he would be interested in producing catalogues of the Diptera collections. Walker responded that he could, and thought it would take him approximately 18 months. In June 1847, Gray gave a report to the Trustees that Walker was interested in the work and requested that he be paid at the same rate as the Assistants (10 shillings per day). The Trustees explained that they did not wish to employ any further staff and requested of Gray whether Walker would instead take a fixed sum as payment for producing the Diptera catalogues. Gray later confirmed to the Trustees that after conferring with Walker, he agreed he could produce the work for a sum of £150.

Table 1. Summary of taxa treated by Walker in his British Museum "catalogues"

Group	Dates	Parts	Pages	Spp. listed	New spp.	% new
Hymenoptera	1846–1847	2	238	1870	183	9.8
Diptera	1848–1855	7	1946	5991	1608	26.8
Homoptera	1850–1858	5	1557	4765	1486	31.2
Neuroptera	1852–1854	4	658	1646	383	23.3
Lepidoptera	1854–1866	35	9658	20774	9676	46.6
Hemiptera	1867–1873	8	1655	7409	1407	19.0
Blattariae	1868	1	239	696	327	47.0
Dermoptera Saltatoria	1869–1871	5	1009	2915	889	30.5
totals	28 yrs	67	16960	46066	15959	34.6

While waiting for word from the Trustees on the agreement to do just the Diptera, Walker had expressed hope that he would be doing the remaining cataloguing as well:

"If my engagement with the Mus.^m should continue I shall hope that [I] see the time when catalogues will be published of all the insects therein." (*F. Walker letter to J.C. Dale, 27 December 1847, Oxford Museum Archives, Dale MS 9, Entomological letter Book, Vol. 2, L–Z*).

The Trustees approved payment at their meeting of 10 June 1848. The *Bill Book* recorded that at some point between 1849 and 1851 Walker was paid a sum of £150 for the first four parts of the Diptera catalogue. The same rate (£37 and 10 shillings per published part) was continued for succeeding catalogues that Walker worked on, with a slight increase in later years to £40 per part.

A rumor was started decades ago that an arrangement of payment was made with Walker to be 1 shilling for each new species and £1 for each new genus he described. This method of payment was mentioned by Horn (1927, 1937), Graham (1979) and even the usually reliable historian Stearn (1998). It seems to have originated from a slightly different statement by John Bernard Smith, which was mentioned by Walker's fervent critic, A.R. Grote in 1895:

"... according to Smith, Walker received a shilling a piece for his descriptions, the Latin thrown in, but the synonyms paid for in specie as good as species." (Grote, 1895: 54; footnote).

This mean-spirited rumor of Walker's payment scheme is false, but has unfortunately persisted for decades and has been the subject of many misinformed unpublished anecdotes regarding Walker, implying he was after money at any cost. The evidence for this assumption included his describing many specimens as new when they were later found to be merely variants of one species described by him or previously by someone else. However, examination of his work and knowledge of his personal life and lifestyle shows that Walker was not a "taxonomic mercenary" of that sort. If he were truly doing this to make money on new taxa, he missed out on quite a few more pounds sterling he could have gotten for genera he did not describe as new (into which many of his species are currently placed), whereas he instead merely lumped these species into large and heterogeneous genera that only later would be split by others into smaller genus-groups. In addition, one would think that the temptation of any payment per new taxon would lead to virtually every specimen that was encountered being described as new. This was not the case. In actuality, Walker described as new less than 35% of all the species he listed in his catalogues (see Table 1).

To clarify matters and dispel the rumor once and for all, Baker (1996: 396) gave a detailed account of the actual payment arrangement with Walker based on the Museum Trustees' *Minute Books* and the *Zoological Department Bill Book*.

Walker was indeed, as some described him, a describing machine. Evenhuis (2008) implied that Walker might have been afflicted with the "mihi-itch", although no one had ever given him that label. The sheer volume of his work is astounding and the amount of research that went into synthesizing the literature associated with every described species in the collections and putting all that knowledge into one single work is an incredible feat in and of itself. His reviewers recognized this and lauded him for those efforts. His life-long friend Edward Newman, in his presidential address to the Entomological Society of London in 1856 gave the following accolades in Walker's cataloguing efforts:

"Mr. Walker, with a laborious assiduity which I have never known surpassed, has produced four Parts of the Museum Catalogue." (Newman, 1856: 61)

As Entomology Department Keeper N.D. Riley said in the preface to the Betten & Mosely's revision of Walker's Trichoptera:

"Nevertheless, there is no disputing that the publication of these lists created the nucleus of described species, and a catalogue of named specimens around which many of the collections have been built. In the Trichoptera, or Caddis Flies, Francis Walker certainly laid the foundations for all subsequent work on the American species, of which, in his time, very few had been named." (Riley, 1940: v).

In an unsigned obituary of Achille Guenée, the author gives a backhanded compliment to the efforts of Walker's industriousness:

"We are by no means certain that this necessity of personally examining "Walkerian" types has not been a great service to our favourite science. Learned students of various groups of insects come from the very ends of the earth to consult the collection of the British Museum, and but for this imperative necessity of their so doing, who knows whether some would ever have visited Europe at all? Thus, indirectly, Francis Walker may have conferred a great boon on our science." (Anonymous, 1881: 216).

But whatever the benefits of his industriousness in producing these catalogues, he was lambasted by many colleagues for the carelessness and multitude of descriptions of new taxa. Shortly after the last part of the Lepidoptera catalogues appeared, Achille Guenée (1868) wrote the following footnote to a paper on New Zealand Lepidoptera:

“The British Museum Catalogues indicate many species proper to New Zealand... I have not been able to recognize many of them from the too often little precise descriptions by Mr. Walker.” (Guenée, 1868: 1).

However, complaints of lack of accurate descriptive matter are at odds with the compliment given to Walker by the sphingid specialist Brackenridge Clements:

“The specific descriptions have been drawn from actual specimens when they could be obtained, and when this has not been possible, the descriptions of Mr. Walker, sometimes modified from the figures of other authors, have been preferred as more accurate and reliable than any with which I have met.” (Clements, 1859: 124).

Cockerell (1941) gave an unusual defense of Walker in balancing whatever shortcomings there might have been in his taxonomy with the conditions under which he was working as well as the state of taxonomy at that time:

“It will be readily understood that this work had to be done in a more or less superficial manner to cover so much ground, and later generations have condemned Walker because they could not make out his species from the brief descriptions ... Yet it is only fair to recognize that nearly a hundred years ago taxonomic methods were poorly developed in comparison with those of to-day, and even in quite modern times very many species (especially Lepidoptera) have been described in a manner which would hardly permit their recognition without specimens or illustrations.” (Cockerell, 1941: 92).

Of the detractors of the works of Walker, almost all complained of his inability to properly distinguish species, describing species as new when they were previously described by someone else, or worse, describing the same species under more than one name and/or in different genera. Grote & Robinson (1868) in their review of Walker’s North American Lepidoptera species, gave an example of the latter:

“To illustrate: the female of our common *Arctia nais* (the variety with red secondaries described by Saunders as *Arctia decorata*), figures three times as a distinct genus and species, being twice regarded as new to science under the name *Aloa colorata* and *Apantesis radians*.” (Grote & Robinson, 1868: 69).

Günther’s history of the British Museum collections summarized the problems of Walker’s taxonomy that led to his being vilified by colleagues worldwide:

“Walker’s work has been severely criticised by many competent specialists, and it must be admitted that some of it is not creditable to the institution. He worked in a purely mechanical fashion, without grasp of the subject or principles of classification; he noted the most superficial characters, using some of them for specific, and the more conspicuous of generic distinctions; the obvious consequence of this method of work was that he not rarely described the same insect under two or more different names.” (Günther, 1916: 8).

In reviewing some muscid types of Walker, Austen (1907) cut to the quick:

“As proving that Walker described the *specimen*, and not the species, the characters of which he was generally incapable of grasping, it may be mentioned that he is responsible for no fewer than eleven synonyms of the well-known *Eutachina rustica*, Mg., the description in every case being based on a single specimen.” (Austen, 1907: 326).

Even the normally kind-hearted and soft-spoken C.P. Alexander did not hold back in his criticism of Walker’s work:

“The notorious work of Francis Walker needs no comment here, most of his descriptions being absolutely unrecognizable and the types of many no longer in existence, many of the names are herein considered as unrecognizable and dropped from consideration.” (Alexander, 1913: 482).

Stål (1862) in his review of Walker’s Homoptera catalogue gave another example, and showed a facetious sense of humor:

“In the British Museum Collection are three examples of an Australian *Aphorophora*, very striking in form and coloration: one of them is described with doubt as a new species of *Clastoptera*, a genus truly belonging to the family Cercopina, but placed by Mr. Walker amongst the *Jassina*; the second specimens he describes, also with doubt, as a new species, but places it in the genus *Aphorophora*; when for the third specimen he fabricates a third new species, he seems to be sure that it belongs to the well-known genus *Aphorophora*—at least there is no sign of doubt given after the generic name. It is wonderful to say, that these three examples are the same identical species with the other.” (Stål, 1862: 480).

Previous to this criticism, Stål’s (1862) review contained a lengthy complaint regarding Walker’s inappropriate or incorrectly formed names. Zeller (1872) followed this with more complaints of many new genus-group names that Walker proposed that either meant nothing or were so close to each other in spelling to potentially confuse:

“*Hat Francis Walker es sich mit den Artnamen leicht gemacht, so hat er für die Benennung dessen, was er neue Gattung nennt, einen andern, aber ebenso bequemen Weg gefunden. Er nahm ein paar Consonanten und ebenso viele Vocale, würfelte sie durcheinander, bis sich etwas wie ein Wort gebildet hatte, und der geforderte Name war da! Welche eine bewundernswürdige Zahl solcher Geschöpfe, wie Davana, Datana, Nadata, Nachaba, Bardaxima, Rusicada, Orudiza verdankt diesem Verfahren ihre Entstehung! Man hat gesagt, solche Namen seien wenigstens wohlklingend. Das möchte selbst für ein englisches Ohr bei manchen Namen, z. B. Tiauspa, Chabuata, Phuphena, etwas fraglich sein. Aber welche Anmassung, Urformen zu bilden, die zum Theil wie kindisches Lallen klingen, die dem Gedächtnisse so wenig Anhalt bieten, dass der Schöpfer derselben selbst sie in der nächsten Viertelstunde vergessen haben muss, und den Lepidopterologen zuzumuthen, dass sie dergleichen Unrath sanktionieren sollen! Hoffentlich werden die meisten dieser Namen, sobald die damit gemeinten Thiere bekannt geworden sind, durch Zusammenfallen mit älteren von Anderen gegründeten Gattungen ihre Existenz und damit ihren Werth für die Prioritätenhüter verlieren!*” [Francis Walker is simple with his formation of species names, and for the designation of what he calls a new genus, he has a different but equally convenient method. He took a few consonants and vowels, then rolled the dice until something like a word had been formed and demanded the name was there! What an admirable number of such creatures as *Davana*, *Datana*, *Nadata*, *Nachaba*, *Bardaxima*, *Rusicada*, *Orudiza* owe their origin to this method! It can be said that such names are at least euphonious. However, for an English ear some names such as *Tiauspa*, *Chabuata* and *Phuphena* would be questionable. But what arrogance to coin original forms, some of which sound like childish babbling and which offer so few clues for the memory that their creator himself must have forgotten them within the next quarter-of-an-hour, and to expect that lepidopterists should sanction such garbage! Hopefully, as soon as most of these names of these animals become known, they will be synonymized with older genera established by others and thus lose their value to the holder of priority!] (Zeller, 1872: 452).

At the height of complaints of Walker’s taxonomy and nomenclature, the editor of the journal *Natural Science* in 1894 coined a term for describing numerous names for one species as a “Walkerism” (Anonymous, 1894). He referred the activity to a short note by Butler (1894) that recorded six different names that Walker had described for the same species of moth (four of which were named in the same publication). Butler simply summarized the situation by saying “This kind of work needs no comment—it sufficiently condemns itself.” (Butler, 1894: 392).

Despite listing the many junior synonyms of species they found that had been named by Walker, Grote & Robinson (1868) all in all gave a relatively balanced review of Walker’s work on the American

species of Lepidoptera, pointing out the benefits of his labors while also enumerating the many deficiencies. However, it is their summarization of the sentiments of others that shows how vehement the feelings were against Walker's work by some colleagues:

"It is perhaps unnecessary to do more than refer here to the very general condemnation with which scientists have received the extended works of Mr. Walker on the insects contained in the British Museum collections. It will be simply sufficient to state that the opinion has been expressed that those works should be ignored, and that the law of priority should be suspended in its operation with regard to these Publications by our Author." (Grote & Robinson, 1867: 67).

Grote's (1875) obituary of Walker reiterated these feelings:

"At this moment, when a kind and amiable man has left us, we renew our appeal made in 1868, that Mr. Walker's material in the British Museum be worked over by a competent hand. In this work reference should be had to the specimens and the descriptions, and every *tenable* name should be fixed, all doubtful names, founded on unrecognizable specimens, should be withdrawn, and in this way Mr. Walker's reputation would be saved from further obloquy, the ends of science furthered and the authorities of the British Museum atone amply for their mistake." (Grote, 1875: 76).

The pitiful thing about his alleged taxonomic fallibility was that Walker himself gave evidence before he began the cataloguing efforts that he was not up to the task. Graham (1979) quoted a portion of a letter written from Walker to A.H. Haliday on 13 January 1837:

"It has often occurred to me that I am unequal to the task of describing these minute insects (*Chalcidites* & *Oxyuri*) with sufficient clearness, but from vanity & the pleasure of examining them I have been unable to desist." (Graham, 1979: 7)

Unabashedly admitting that vanity and personal pleasure were the primary reasons for describing as new these minute and otherwise difficult to distinguish specimens is an illuminating one that gives a glimpse into the personality of this man. Perhaps his social station gave him no reason to think that such an excuse was not problematic?

Additional evidence of self-deprecation and an example of his style of apparently quickly executed descriptions is found in a quoted letter of 10 December 1843 from Walker to Charles Darwin concerning Walker's examination of the specimens of Chalcidoidea collected by Darwin:

"I am glad that your *Chalcidites* are safely deposited in the British Museum, & I hope to soon to be also examine their structure more closely than I did when I described them." (Burkhardt & Smith, 1987).

This implies that the initial descriptions of some of these parasitic Hymenoptera published by Walker were superficial and done in haste. The possible reasons for this are many but might have been either to meet a deadline of a loan of specimens or that he had much more "on his plate" of projects to get done and still maintain his family responsibilities. An initial cursory diagnosis and publication, then a more detailed analysis upon subsequent review might well have been Walker's actual descriptive methodology in the cataloguing efforts for some groups as well as is evidenced by the number of corrections and synonymizations (including many for his own species) that Walker made in the supplements, additions, and errata to his catalogues.

Another scenario that led to the publication of more than one name for the same specimen was hypothesized by his room-mate at the British Museum in the late 1860s and early 1870s, lepidopterist, A.G. Butler¹:

“Mr. Walker comes in one day and describes a new species; but, owing to the lateness of the hour, or some other cause, omits to label it as a type; the next time he comes to the collection he continues his MS., and, finding this species without a label, forthwith re-describes it. This will, I think account for the several instances which I have noticed of evidently the same species described twice over in consecutive pages of Walker’s catalogues.” (Butler, 1876: 402).

Smith (1893) gave more details from Butler (1876) combined with Butler’s personal recollections:

“His habit was to pin into a box, in series, as many specimens as it would conveniently hold, and then begin describing. At the end of the day’s toil the box would be closed without indication of what had been accomplished, and next morning work would be recommenced from recollection of what had been previously done. None of the specimens were labeled until the descriptions were in type, and then, using a proof sheet, the printed names were cut out and pinned below the series of specimens, not on the insects themselves. Sometimes it happened that there were more names than insects; in such case the label was pinned into the box and, occasionally, the record “type lost,” was made. Thus, sometimes two of Walker’s names may refer to the same specimen as well as to the same species, and it is not always easy to ascertain when this is so. Judging from the fact that sometimes the descriptions do not in the least fit the specimens labeled, there is reason to believe that no great care in applying the names was exercised.” (Smith, 1893: 7).

Distant (1899a) clarified Walker’s labeling and proposed a different hypothesis for the problem of two names for the same specimen or species:

“He [Walker] never labeled the specimens; he was an industrious though, it must be added, reckless describer, and it seems probable that when he sometimes discovered his mistakes he shifted the specimens to more proper positions and maintained a discrete silence as to the process.” (Distant, 1899a: 30).

This shifting of species was corroborated by Grote (1890) who, in a face-to-face meeting with Walker mentioned to him that he may have created a number of names for the same species:

“Between my first visit, during Walker’s life time, and my last, fifteen years later, there seems to have been, in some instances, a shifting of specimens under one label. And since I drew Mr. Walker’s personal attention to the fact, that certain of his specific categories contained examples belonging to different species, which he then and there, standing over the drawers admitted as probably true, it may well be, that, after my visit, these changes were made since additions were made also.” (Grote, 1890: 17).

In a few instances Walker would correct his mistakes in the addenda to his catalogues. Most of these corrections were straightforward, but in some cases the correction does not give much helpful associated information. Take the following example of one of his corrections:

“Page 329. *Tortrix conclusana*. This name must be annulled, as the species is described elsewhere, and is not one of the Tortricidae.” (Walker, 1864b: 985).

¹ In addition to this hypothesis, there is also a rumor that Walker would work down each column of pinned insects in a drawer and describe each one at a time. Whenever he took a break, he would place a pin at the point he stopped. Assistants would confound him by moving the pin up a few specimens and when Walker returned he would describe the same specimens as new again. Unfortunately, the rumor could not be verified in this study.

Unfortunately in this case, Walker gives no clue as to what species this name is synonymous with or to what family it belongs if not the Tortricidae.

Another tale related by Horn (1937) implied Walker to be a bumbling fool. He alleged that often Walker would take specimens home to work on them, and not uncommonly the boxes with specimens would fall into the street. Walker's Bedford residence was within a short walking distance and he was curating the Entomological Club collections there (but he resigned that work in 1852). It is more probable that Horn (1937) was perpetuating rumors since, in that short piece, he portrayed Walker extremely negatively and also mentioned other acidic reviews of him (and included the cash-for-new taxa myth).

Hymenoptera.—The first group that Walker catalogued was the order Hymenoptera. But he did not enter into organizing any other part of the Hymenoptera collection other than the “Chalcidites” (Chalcidoidea). This group was probably chosen by him as his initial entry into the large task of cataloguing and organizing the collection because he had the most experience with this group since his early papers in the 1830s. According to Arrow & Hampson (1906), Walker's catalogues were the first attempt at organizing the Hymenoptera. Two parts appeared (the first in 1846 and the second and last in 1848). Both parts apparently were done without pay as Baker's (1996) details regarding the original arrangement made by the Trustees with Walker were for the Diptera catalogues. Thus, without any prospects for remuneration, Walker did not work any further on Hymenoptera. Additionally, after the appointment of Dr. Frederick Smith in 1850 to curate the Hymenoptera, the remainder of the Hymenoptera were organized and catalogued by Smith. In the two parts on Chalcidoidea published in 1846 and 1848, some 1,870 species were treated by Walker, among which are descriptions of 183 new species. The extremely low percentage [compared to his other catalogue parts; see Table 1] of new species proposed in these two parts (9.8%) is due to the fact that only the Chalcidoidea were treated and Walker had, previous to this, already described the majority of the species listed.

A quarter of a century later, noting that Smith was working primarily on bees and not on the smaller parasitic Hymenoptera, Walker, in a letter to Frederick McCoy of 30 April 1872, indicated he had hoped to publish additional catalogues of Hymenoptera:

“There is a vast field for investigation in the exotic Ichneumon.^{da} and neighbouring tribes, & I hope to arrange some of the materials in the Brit. Mus.^m as it does not seem that any one else will come forward to do so.” (*F. Walker letter to F. McCoy, 30 April 1872, Museum of Victoria, Melbourne*).

But Walker's hopes were dashed as late the next year his cataloguing arrangement with the Museum would come to an end and no further parts of this or any other group would appear under Walker's authorship.

Diptera.—The next group that Walker took on was the Diptera. This was also another group for which Walker had previous experience and a personal interest and the first one that Gray arranged with Walker to work on for pay. The first part appeared in 1848 and three subsequent parts appeared in rather quick succession in 1849. These four parts completed the £150 contract that Walker had with the Museum Trustees, but he was not done with the Diptera. A gap of five years ensued (during which he arranged with Gray and the Trustees to organize and catalogue other groups). He then finished the organizing and cataloguing of the Diptera by publishing three “supplements” in 1854 and 1855. Arrow & Hampson (1906) stated that Adam White was probably the first to arrange the Diptera collection in

the first 10 years of his employment at the museum. Thus, Walker was only the second person to organize the collection. During the early 1850s, there were significant additions to the collection including the material collected in the Amazon by Henry Walter Bates (1825–1892) (Fig. 19) and Alfred Russel Wallace (1823–1913) (Fig. 20), and the 90,000 specimens of British insects of J.F. Stephens (Arrow & Hampson, 1906), many of which promptly appeared in those three supplement parts. In the 7 parts of the Diptera catalogues a total of 5,991 species in the British Museum collection were treated by Walker in 1,946 pages, including the descriptions of 1,608 new species (less than 27% of the total species listed).

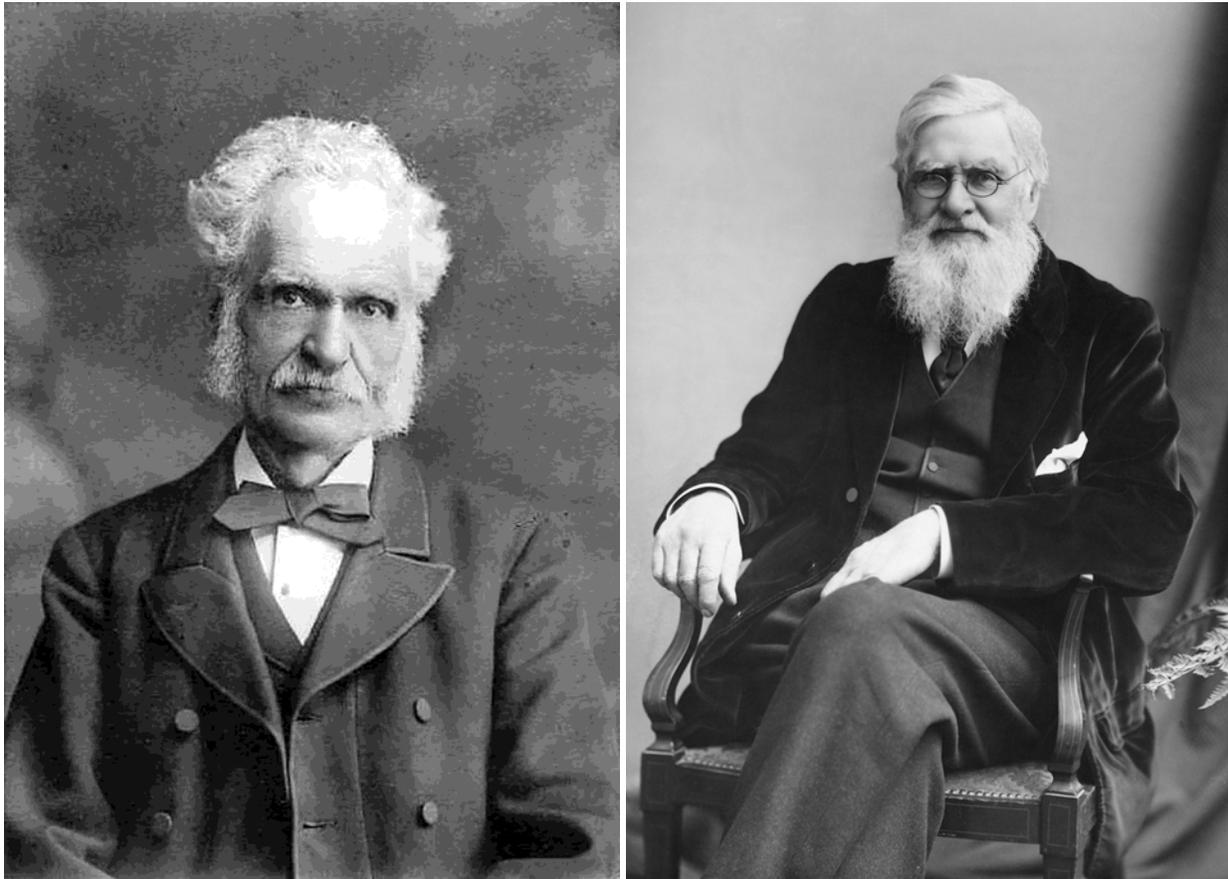


Figure 19–20. Portraits. **19** (left). Henry Walter Bates (1825–1892). **20** (right). Alfred Russel Wallace (1823–1913).

Homoptera.—Walker published on aphids in some of his early publications, so it is most likely because of this that Gray arranged with Walker for the homopterans to be his next group to organize. Four parts appeared within a few years, from 1850 to 1852. A supplement was published in 1858. In total, 4,765 species were listed, of which 1,486 were described as new.

Stål's (1862) review of Walker's cataloguing has been mentioned above. In addition to that, Doncaster (1961) in working on the types of Francis Walker's aphids, reviewed the taxonomic status of his species, most of which were described earlier than the Museum catalogues.

Neuroptera.—The definition of “Neuroptera” *sensu* Walker was much more broad than today, and included the Trichoptera, Thysanoptera, Embiida, Mecoptera, Isoptera, Ephemeroptera, Psocoptera, Neuroptera, and Odonata. Walker worked on this group shortly after finishing the Homoptera. From 1852 to 1854, four small parts appeared, comprising a total of 658 pages. A total of 1,646 taxa were treated, of which 383 were described as new.

Gray was always making sure that the Museum’s collections were adequately represented or better than when compared to those in continental Europe. Not long after Walker completed his cataloguing of this group, Gray contracted then Königsberg-based Herman August Hagen (1817–1893) to complete special volumes of the “*Catalogue of neuropterous insects*”. However, only one small 34-page part appeared, dealing only with termites (Hagen, 1868). This catalogue volume was unique in that it was made in order to give a list of the genera known to exist in European museums and, of the taxa listed, to specially note the ones that were present in the British Museum. The Hagen catalogue could then be used both as a “shopping list” by other museums and as a desiderata list to effectively add to the Museum’s collections those taxa for which they were deficient. The latter could easily be accomplished by engaging in exchanges of material with continental European museums in addition to cost-effective purchases of material by Museum officials from local sales agents. Walker’s more detailed cataloguing of this group served as the basis for Hagen’s “shopping list”¹.

Lepidoptera.—Edward Doubleday was employed by Gray in 1842 to curate the Lepidoptera and, as such, wrote the first three parts on that order, which came out from 1844 to 1848 under the title “*List of lepidopterous insects in the British Museum*”. Doubleday passed away in mid-December 1849 and Gray arranged with Walker in 1854 to recommence organizing the Lepidoptera collection and cataloguing them, but as a newly entitled series.

The catalogues of Lepidoptera by Walker are the largest of the entire series of Gray’s inventory of the British Museum’s natural history collections. Spanning 13 years (1854–1866) and comprising 35 parts and 6,772 pages, these catalogues by Walker list 20,774² species, of which 9,676 were described as new. The new species described by Walker in the Lepidoptera catalogue surpasses the total number of new species he described in other orders in all the other catalogues combined.

When beginning work on the Lepidoptera, Walker had no previous published taxonomic experience with this group³. This no doubt was a source of major consternation among those who were well-known specialists in Lepidoptera, especially when Walker would end up describing more new species in Lepidoptera than in any other group he worked on—and more than many of his

¹ Despite Gray’s laudable intentions to produce these catalogues for the benefit both of the British Museum trustees and staff, visitors to the collections, and other museums, the combination of problems with Gray’s supervisor, Richard Owen who (against Gray’s protests) claimed to be supervisor to not only Gray’s staff but also persons Gray contracted to produce these catalogues, and problems with the Museum’s Head Librarian’s being vehemently against publication of these catalogues, caused the number of contracted persons (which included Hagen) to decrease from eight in 1857 to zero (with the exception of Walker) by 1860 (Gunther, 1975: 131).

² In his summary, Walker (1866b: 1985) estimated “between 20 thousand and 21 thousand species are enumerated”. A page-by-page count during this study that gave a total of 20,744 showed his estimate to have been pretty much on the mark!

³ In fact, Walker’s sole publication on Lepidoptera prior to cataloguing the museum’s vast collections and ultimately describing thousands upon thousands of new species was only a short note on the larvae of *Agyastes* (Walker, 1845).

contemporary lepidopterists. Most of the published reviewers, both British and non-British specialists, were extremely critical of his work on Lepidoptera.

As pointed out by Gunther (1975), many unpublished complaints were made of Gray, who had contracted Walker for the job. However, the complaints did not affect Gray whatsoever and he continued to use Walker not only for the rest of the Lepidoptera parts, but subsequent orders of insects in the collection as well. According to Günther (1916), Gray was more interested in the productive capacity of Walker as opposed to whatever taxonomic problems might have resided in his work.

“Although Dr. Gray had become aware of the imperfections of Walker’s work, he continued to employ him during the whole time of his Keepership, as the mass of materials were reduced at least to some sort of order, Walker being an indefatigable worker, who, in fact, could not be replaced.” (Günther, 1916: 8).

Walker was indeed the most productive of all the specialists contracted by Gray and, especially when most had left their contractual obligations by 1860, Walker continued to publish part after part thereby improving Gray’s goal of increasingly enhancing the collection through exchanges and donations.

Gerstaecker (1857) noted another problem in Walker’s methodology of cataloguing the Lepidoptera collections that, when combined with quickly manufactured descriptions, may well have caused him so much trouble with publishing what were ultimately found to be junior synonyms. In reviewing the seventh part of the Lepidoptera catalogue (Walker, 1856a), Gerstaecker (1857: 424) pointed out that the species of Herrich-Schaeffer published in the various parts of his “*Lepidopterum exoticorum species novae*” that were missing in the previous parts of Walker’s Lepidoptera catalogues were now included in the seventh part but Gerstaecker found it amazing that virtually all of the Herrich-Schaeffer names remained independent of Walker names and that Walker still named more new species in addition to the Herrich-Schaeffer names.

What most likely occurred in this instance—and may have been a typical Walker methodology throughout his cataloguing of the British Museum collections—was that Walker listed all the names of the species he found labeled as such in each drawer and described as new those that did not have determination labels already associated. When adding the Herrich-Schaeffer names to catalogues, he merely did this to appease critics and make his work more “complete” but continued his methodology of describing as new the vast majority of the remainder of specimens found in each drawer without determination labels. This methodology, evident in the Lepidoptera catalogues (and may have also been implemented in other catalogues), may possibly have been due to time constraints. Walker’s cataloguing of the Lepidoptera collection was enormous. To not only add the new species names but have to also compare their descriptions with other described specimens in the collection would take a great deal of time—a luxury he obviously had little of since he was under contract—so making comparisons with previously described species or even making keys to species (which had been commonly included in earlier catalogues) was done sporadically (or not done at all in later catalogues) in order to be able to more quickly finish the current part he may have been working on. Extreme examples of adding hundreds of Herrich-Schaeffer names with only a line for each and continuing to describe other specimens as new can be found in later parts to the Lepidoptera catalogues (especially parts 27, 28, 29, 30, and 31; i.e., Walker, 1863a, 1863b, 1864a, and 1864b, 1865).

Hemiptera.—The Hemiptera were taken up as soon as the Lepidoptera were finished. Walker published eight parts from 1869 to 1873 totaling 1,665 pages. A total of 7,409 species were treated, among which 1,407 were described as new.

After beginning the Hemiptera, they were put aside for a short time as Walker commenced work on the “Blattariae” and Orthoptera (his “Dermaptera Saltatoria”). He originally envisioned 10 parts for the Hemiptera but only completed 8 parts by 1873. The continuing additions to the collection in the years since he began the group caused him to enquire about publishing an additional one or two volumes:

“I have finished my catalogue of Hemiptera & it is about to appear & I have also published a supplement to it — & another suppl.¹ may perhaps appear afterwards.” (*F. Walker letter to F. McCoy, 20 September 1873, Museum of Victoria, Melbourne*).

This part to which Walker refers as “about to appear” came out a few weeks after this letter, on 11 October 1873, but no further volumes or supplements ever appeared. It is apparent from the last published part that this was not a complete inventory as Walker did not provide a summary as he had done for the Diptera and Lepidoptera. Part VIII of the Hemiptera was to be the last of the Museum catalogues to appear under Walker’s authorship.

In contrast to the later volumes of Lepidoptera, which appeared to have been hastily put together (possibly due to contractual time constraints) and lacked the keys to genera and species he had published in the earlier parts, the parts on Hemiptera had keys throughout all eight parts.

The only oddity was in the last part (Part VIII) where no new species were described in the last 116 pages of the 206 pages that formed the catalogue proper (i.e., excluding the errata and index). Only previously published species by other authors were listed and a few keys to species that had multiple species per couplet with no further resolution. Perhaps he was told before finishing this part that this would be the last part and was no doubt told to not spend any more time than was necessary to complete it.

Blattariae.—One initial volume on Blattariae appeared (in 1868) with supplements to it included in the first and last parts of the “Dermaptera Saltatoria” (see below). The single initial volume was comprised of 239 pages in which 696 species were listed, of which 327 were described as new.

Dermaptera Saltatoria.—As with the Neuroptera, the “Dermaptera” *sensu* Walker encompassed a much broader definition than today and included the orders Dermaptera and Orthoptera; the “Dermaptera Saltatoria” in these catalogues essentially treated only the Orthoptera. It was not until the “Supplement to the Dermaptera Saltatoria” in the fifth (and last) part was published that we discover that Walker followed the classification of Fischer de Waldheim for the “Dermaptera”, who included “*Blatta, Mantis, Phasma, Gryllus, Locusta, Acridium*”, and who ironically removed the large dermapteran genus *Forficula* to a separate group Labiduroidea [Walker, 1870 (Suppl. Dermapt.): 113–114]. Walker explained here that he did not treat *Forficula, Mantis, or Phasma* in his catalogues.

This was the last group in the British Museum that Walker arranged to be organized and catalogued and there is no evidence that any further catalogues were in manuscript at the time of his death. Published over a span of three years (1869–1871) comprising 5 parts and 1,009 pages, this catalogue treated 2,915 species, of which 811 were described as new.

The Orthoptera catalogue was initially begun in the late 1850s with the publication of the Phasmidae by Westwood (1859). However, it being profusely illustrated by Westwood added to its production

costs and the Trustees decided no further parts would be published. Walker took over responsibility 10 years later and continued his less costly format of text-only descriptions that more appealed to the expense-minded Trustees.

Part I of Walker's catalogues of this group dealt with the Gryllidae; Part II with the Locustidae; parts III and IV with the Acrididae; and part V with the Tettigidae. Part V also included a second supplement to the Blattaria and well as a supplement to the Dermaptera Saltatoria. A separate section on the geographical distribution of the "Dermaptera" contained continuing pagination from the Dermaptera Saltatoria supplement. This last section was added no doubt as a result of Walker having become interested in the distribution of insects after working with A.R. Wallace's specimens.

Correspondence from Walker to associates as late as 1872 indicates that he had asked for permission to do more work on Hymenoptera and Diptera, and a letter to Frederick McCoy in 1873 (see above) mentioned a hopeful additional volume on the Hemiptera, but further volumes on those groups never appeared. Without any detail of an explanation, one line in an 1874 letter to Frederick McCoy tells of the end of his British Museum cataloguing:

"... the present arrangements at the British Museum are alone sufficient to oblige me to cease naming insects there ..."*(letter from F. Walker to F. McCoy, 11 April 1874, Museum of Victoria, Melbourne).*

According to Günther (1916), the arrangement actually ceased in 1873. The letter of 11 April 1874 was the first Walker had written to McCoy since 10 September 1873, so the actual cessation of his cataloguing agreement with the Museum might have ended shortly after September 1873. However, this end to his cataloguing came too late as the damage to his reputation had already been done.

6. Other Publication Projects

After spending the first few years of marriage in the 1840s focusing primarily on his family, Walker once again continued his industrious work pace and mixed his publications with travel, the latter of which most likely were collecting trips. Graham (1979) and Newman (1874) listed some of the trips he took, in Britain and on the continent. Although he traveled often during his life, he never ventured outside of Europe.

Walker seemed to have a penchant for getting involved in large works, maybe due to his intense desire to name new species; and, the larger the work, the more new names would result. But his ability to put names on insects was also the desire of owners of collections who wanted to not only know what insects were in their cabinets but also possessing named specimens of new species would fetch a higher price when sold to agents. So, ultimately, Walker fed a hungry cadre of collection owners with names for their collections while at the same time satisfying his “mihi itch” by publishing new species under his authorship.

Insecta Britannica (Fig. 21).—After beginning his work on the British Museum catalogues, Walker engaged himself in other concurrent projects. One of these was the three-volume *Insecta Britannica* dealing with Diptera. The “*Insecta Britannica*” project was one that was hoped for years before by William Kirby and William Spence, the authors of the famous *Introduction to Entomology* (Kirby & Spence, 1815–1826). After discussion of the need for such a series, a committee was formed by the Entomological Society of London in 1849 that consisted of the current president of the Entomology Society, and the secretaries of that Society, Spence (Kirby was in ill-health by this time), James Francis

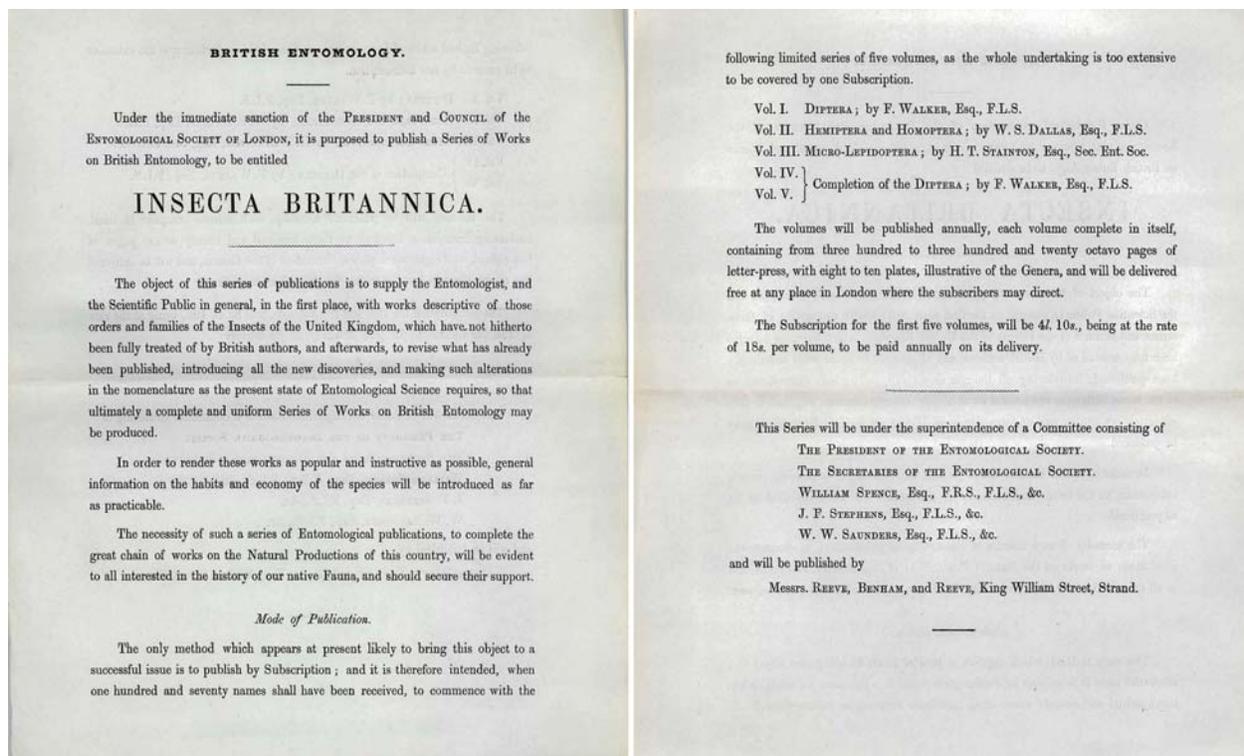


Figure 21. The two-page prospectus for the *Insecta Britannica* project. Oxford Museum Archives.

Stephens, and William Wilson Saunders. To see their idea to fruition, the committee worked with the publishing house of Lovell Reeve and Ebenezer Benham. The series was envisioned to encompass all the orders but the publishers Reeve & Benham¹ could only get commitments for the Diptera (by Walker), Hemiptera (by W.S. Dallas)², and Lepidoptera Tineina (by H.T. Stainton).

An anonymous review, after the first volume of the series appeared, indicated that the series was something Britain should have published long ago and used the review as a medium for complaining of the lack of government support for science:

“There are few countries in the world in which science and its cultivators are so little regarded; if not actually frowned upon, as this. With larger opportunities for the cultivation of science than any other nation ... we are yet behind most of the Continental kingdoms. There are many reasons for this, —but the most obvious is, the almost entire neglect of scientific education in our national universities.” (Anonymous, 1853).

Noting this lack of government support, the committee organized a subscription list to help defray publication costs:

“The entomologists of Great Britain have long had to regret that no complete description of British insects had yet been published; although it was well known that entomologists existed amongst us who were capable of producing such a work. they felt that this undertaking was more than could be expected from any existing publishing Society, such as the Ray:—and they have accordingly formed a subscription list for the publication of works descriptive of those orders and families of the Insects of the United Kingdom which have not been hitherto been fully treated of by British authors.” (Anonymous, 1853)

Notice of the upcoming first volume of the series, by Walker on Diptera, was published by dipterist, Richard Henry Meade (1814–1899):

“No work exists in the English language, describing the genera and species of British Diptera, and it is necessary to have recourse to foreign authors. I am glad to say that this difficulty is soon likely to be removed, for the publication society which has recently been formed, under the patronage of the Entomological Society, intends to commence a series of works entitles, ‘Insecta Britannica’, by a volume of Diptera, from the pen of Mr. F. Walker, who is well known for his attention to this order of insects” (Meade, 1851: 2960).

True to form, Walker wasted no time and quickly produced the first volume, which came out at the end of 1851 (Walker, 1851). It must be remembered that this was not the only project he was working on, which makes the production of this major work even more remarkable. At the same time as he was working on this, he was in the midst of the British Museum cataloguing (the main volumes of the Diptera having been completed in 1849 he was now commencing work on the homopterous insects) and he was also producing volumes of the *Insecta Saundersiana*. Combine this with the fact that he also traveled to Switzerland in the summers of 1850 and 1851 and one wonders where Walker got the time to do all that work!

¹ By the time of the second Diptera volume in 1853, Lovell Reeve was the sole publisher, Benham having left the partnership (Pettit, 2007: 25) by mutual consent on 31 December 1851 and public notice of the change in proprietorship given on 13 March 1852 in 16 March issue of *The London Gazette*, No. 21301, page 814. The fact that the two names are on an 1852 first volume is no doubt due to the fact it was typeset before the partnership was dissolved and was more cost-efficient to not re-typeset all the front matter because of the late change in publishers.

² This work was never published by Dallas in this series and was instead taken over by John William Douglas and John Scott and eventually published by the Ray Society in 1865.

The first Diptera volume of *Insecta Britannica* (Walker, 1851) (Fig. 22) comprised 314 pages and was followed in 1853 (volume 2; 297¹ pages) and 1856 (volume 3; 352 pages). As the preface to the third volume states, not all the Diptera could be completed; the Muscidae were omitted as they would require a fourth volume. It was planned that A.H. Haliday would do these, but publication of this fourth volume of Diptera never happened. In all, 2,086 species of Diptera were listed in the three volumes, with 373 described as new by Walker.

But not all of the new taxa proposed in these volumes are Walker's and the true authorship has been confused by some subsequent workers. The preface to volume I written by Walker states:

“Mr. Haliday has contributed the characters and synoptical tables of the *Diptera*, of the *Empididae*, and of the *Syrphidae*, and the whole of the *Dolichopidae*; and I am indebted to him for his kind assistance in other parts of the volume.” (Walker, 1851: [i]).

This equates to Haliday being responsible for making available any new genus-group names for Empididae and Syrphidae that appear in the keys, and all new genus-group names and species-group names in the Dolichopodidae. The remainder of the new taxa in volume I are Walker's.

Haliday (1855), in his review of Zetterstedt's Scandinavian Diptera treatises as far as were published at that time, quoted Walker's preface to volume II of the *Insecta Britannica* stating that Walker presumed number of British and Scandinavian Diptera to be about equal. Haliday's table of numbers of Diptera by family comparing Zetterstedt's *Diptera Scandinaviae*, Curtis's *A Guide to arrangement of British Insects* (1829–1831) and Walker's *Insecta Britannica* showed the British Diptera fauna to be actually much lower than the Scandinavian. But what is more interesting is that Walker, known elsewhere for his penchant for possibly frivolous naming of new species, was coming up with lower numbers of British Diptera species than were previously recorded by Curtis in his *Guide* (i.e., he was synonymizing more species than he was describing).

***Insecta Saundersiana*.**—Whether a need for additional funding (additional to what he was getting from his contracts with Gray) to further augment his annuity or for some other reason, Walker entered into another project, this one the *Insecta Saundersiana* (Fig. 23) which would be published by the well-known Paternoster Row bookseller, John Van Voorst. The project encompassed a number of privately printed booklets on various orders of insects in the collection of William Wilson Saunders. Saunders arranged for Walker to do the Diptera and later, the Homoptera.

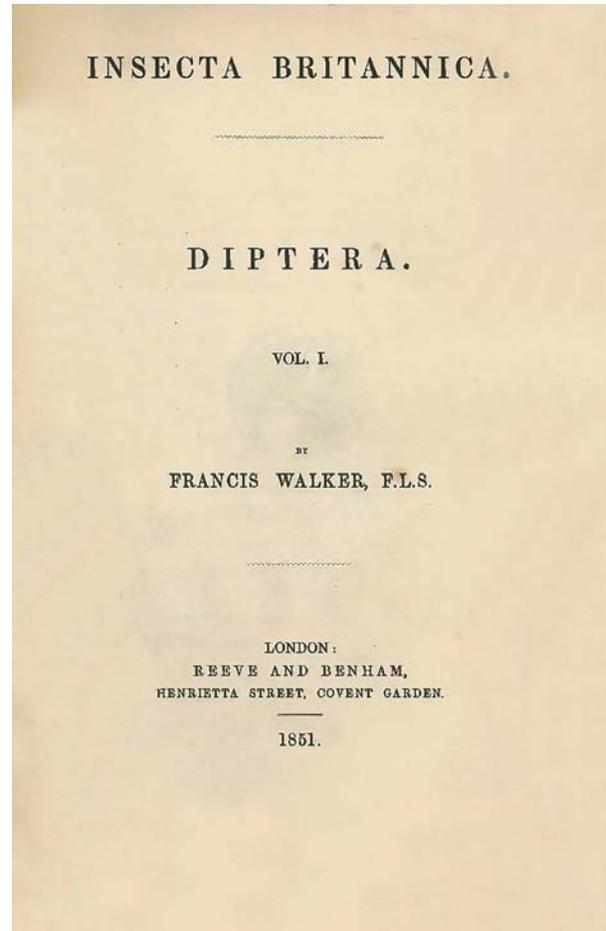


Figure 22. Title page of the first volume of *Insecta Britannica*, Diptera. Bishop Museum Library.

¹ Newman (1874) said this has 298 pages, but there is one unnumbered page at the end.

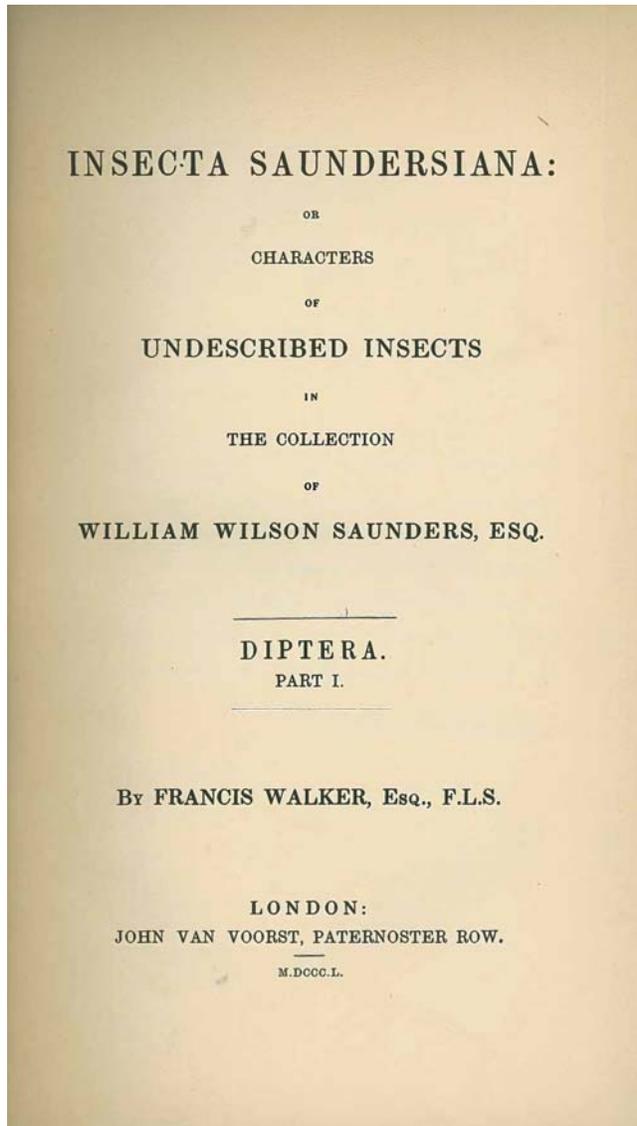


Figure 23. Title page of the first part of *Insecta Saundersiana*, Diptera. Bishop Museum Library.

The entire Diptera contribution spanned the years from 1850 to 1856 and comprised 5 parts. Although labeled as “Vol. 1”, subsequent contributions on other orders were without printed volume numbers but were sometimes referred to by volume number in bibliographies, which followed the volume numbers that were printed in the prospectus and various advertisements.

William Wilson Saunders (1809–1879) (Fig. 24) was a wealthy insurance broker¹ and an amateur entomologist and horticulturist. He spent a year in India (1830–1831) as an engineer in the East India Company and in his leisure time collected plants and insects. Upon his return to England in 1832, he made many of these specimens available for study by others, and they were also the subjects of his own papers. This material formed the corpus of specimens that Walker examined for his 5-part series on Saunders’s Diptera. In addition to his own collections, Saunders also acquired the collections amassed by his friend and colleague, A.R. Wallace in the Malay Archipelago. These were acquired by Saunders during the years Wallace was in those Indonesian islands. Saunders had made an agreement with Wallace to set aside specimens of insects that were not of interest to Wallace and before Wallace sold the remainder to London natural history sales agent Samuel Stevens [Saunders *in* Walker (1856b: 4–5); see also Baker (2001) for an excellent and thoroughly researched study tracing Wallace’s material from field to sale].

Because Wallace left for his trip to the Malay Archipelago in 1854, Walker was not able to include the Wallace material in the already completed *Insecta Saundersiana* parts, so he added them in subsequent papers, which were published in the *Transactions of the Entomological Society of London* and the *Proceedings of the Linnean Society* in the late 1850s and into the 1860s.

“Mr. Wallace’s entomological collections pass into my hands, and being desirous of making his labours scientifically useful, I have requested Mr. F. Walker, who has such an intimate knowledge of the insects belonging to the order *Diptera*, to draw up the following catalogue of the dipterous insects discovered by Mr.

¹ He unfortunately lost his fortune in 1873 when the firm of which he was head failed in the crisis that affected mercantile insurance (Carrington, 1879: 279). He disposed of his collections and retired to Worthing where he devoted himself to horticulture (Woodward, 1897: 331–332).

Wallace at Singapore and Malacca. My object in so doing is to establish a kind of starting-point for tracing hereafter, when all Mr. Wallace's collections shall have come to hand, the geographical distribution of the *Diptera* in the very interesting portion of the globe which Mr. Wallace is now investigating with such indefatigable zeal." (W. Saunders, 1857, *Journal and Proceedings of the Linnean Society of London, Zoology* 1: 4).



Figure 24. William Wilson Saunders (1809–1879).

Walker's work with the Wallace material, which included specimens sent by Wallace directly to him [123 specimens of Diptera and 72 of Homoptera from Singapore and 170 specimens of Diptera from Sarawak¹; according to Wallace notebook p. 5 (Baker, 2001)] as well as his work with Wallace material that was purchased by Saunders, apparently afforded him to retain some specimens in his personal collection as these were the later subjects of sales of specimens to the National Museum of Victoria (now the Museum of Victoria; see more details below).

In total, the 5 Diptera parts of the *Insecta Saundersiana* series comprise 473 pages in which 781 species were identified and named. Of these, 764 were described as new by Walker.

The Homoptera² were contained in a single part, published in 1858, comprising 117 pages. This series too was started before the majority of Wallace material was being sent to England, so no species from the Wallace collections were treated in this work and instead appeared in

subsequent papers published in the *Transactions of the Entomological Society of London* in the 1860s. Some 229 species were listed in this 1858 work, all of which were described as new.

Other Papers. Although Walker did not catalogue the Coleoptera collections in the British Museum, this did not spare him from the bile of coleopterists who treated his names worse than any other group of his entomological colleagues except perhaps the lepidopterists. Despite not cataloguing the Coleoptera, he did publish a number of papers describing new species of beetles, and the papers that described those from "Ceylon" [= Sri Lanka] (Walker, 1858c, 1859a) seemed to have gotten the worst treatment from colleagues.

"The diagnoses attached to the names are no better than a haphazard collection of words so far as their use is concerned in determining the species, and their reference in so many cases to well-known genera is generally ridiculously wrong and pure guesswork. Under these circumstances I consider Walker's names as entitled to no more authority than those of a catalogue." (Bates, 1886: 69).

¹ See Polaszek & Earl of Cranbrook (2006) for details on the species described from the Sarawak material.

² This part was not listed in either of the two major bibliographies of this period (Hagen, 1863; Horn & Schenkling, 1929).

Sharp (1890) followed Bates's (1886) lead in essentially ignoring Walker names if they were not preceded by a name proposed by a different author. In those cases, despite the fact they had a Walker name that stood by a specimen, Sharp and Bates provided their own new name for it.

However, these coleopterists' view of Walker with regard to his work on Ceylonese beetles is diametrically opposed to the kind words of the homopterist, W.L. Distant, who in 1893 complimented Walker:

“The approval of the work of the late Fras. Walker has already been more amply shown. We have an adage “imitation is the sincerest form of flattery”, and Mr. Kirby in his Ceylon paper has exactly copied the method of his master.” (Distant, 1893: 71).

Another series of papers pertained to material collected by John Keast Lord (1818–1872). An initial collection of insects made by Lord when he was employed by H.M. Boundary Commission in Canada was obtained by the British Museum sometime after 1860 when he began work with the Commission. Baker (2002) traced the acquisitions by the British Museum of various animals from Lord's collecting but no explicit records exist on the accession of the insect material. In any case, Walker worked up most of the insect material (Frederick Smith described a new bee) and these descriptions of new species of insects were published in an Appendix to Lord's “*The naturalist in Vancouver Island and British Columbia*” (Lord, 1866).

Lord was in the Pacific Northwest from 1858 to 1862 and, after a stay of a few years in England as a writer and lecturer, traveled to Egypt. From January to July 1868 he accompanied geologists Hilary Bauerman and Clement LeNeve Foster at the request of the Viceroy of Egypt to make investigations with regard to the mineralogy of Egypt and the Sinai [see Bauerman (1869) for an account of the geological investigations and places visited]. While there, Lord and Bauerman made botanical and zoological collections of the area. A short second trip to the same area took place in late 1869 (Buckland, 1872; Anonymous, 1873; Baker, 2002). Lord (1870) serialized his Egyptian adventures (labeling himself as “Naturalist to the Egyptian Exploration Expeditions”) in 32 parts in the penny weekly magazine, *The Leisure Hour*. Those interested in the localities visited by Lord, which may (through some digging into the various serialized accounts) be associated with specimens collected, are referred to this work for further details.

Walker's previous work with Lord's Vancouver and British Columbian material must have met with his approval for Lord arranged to have Walker describe the preponderance of the insects he collected on this Middle East trips. Walker's taking on the Lepidoptera and Diptera were no surprise as he had been working with these orders, but his working up the Hymenoptera that Frederick Smith had not named was, as Baker (1996) claimed, unfortunate. The lament by Baker of his Hymenoptera work from Lord's Egypt material was the same as others had made for Walker's work on Coleoptera and Lepidoptera in general: the descriptions were bad and many of the species were unrecognizable, especially so since the majority of the specimens upon which they were based were returned to Egypt and subsequently suffered loss and destruction [see Innes (1912) and Baker (1996) for details]. Evenhuis (1997: 497) mentioned a June 1864 auction by the Stevens auction house as possibly including insects from Lord, but this seems unlikely as his Canadian specimens reached the British Museum before that date and the first Egypt trip was not until 1868.

7. Zoocecida and Plant-Insect Interactions

Walker maintained an active interest in a few groups of insects and entomological topics throughout his life. Diptera and parasitic Hymenoptera were two. The interactions of plants and insects in general was another. Walker's first paper on these insects was a short note on the *Aphis* of cow parsnip and written under the pseudonym "Tot" in 1835 (Walker, 1835b). The reasons for him using the pseudonym are unknown but it was the only time he did.

Walker's work on aphids seems to have met with the same reviews as for other orders but there are also positive comments. He was one of the first to make out the different larval forms in the life cycles of some species. He also recognized the distinctions between sexual and parthenogenetic forms.

He mounted his specimens in Canada balsam on glass slides (he called "slips") and had an entrepreneurial idea that sets of identified aphids on these glass slips would be eagerly bought by many persons, most especially nurserymen, gardeners, and farmers. Many of his letters to J.C. Dale mention aphids, and in one he outlines his ideas for pricing:

"It has occurred to me that by preserving large numbers [of aphids] I can extend my knowledge of the tribe & supply the public with interesting microscopic objects. This is the only way in which the characters of Aphides can be preserved, & it answers the purpose thoroughly. An entire set of these will be a complete and vivid illustration of my work. I have fixed a twopence as the price of each slip of glass thus prepared, & every slip sp. will have it's name, date, locality, & the plant on which it was found." (*F. Walker letter to J.C. Dale, 14 May 1847, Oxford Museum Archives, Dale MS 9, Entomological Letter Book, Vol. 2, L-Z*).

Dale was one of these buyers as is evidenced in various letters from Walker to Dale subsequent to the one above thanking him for receipt of various sums in payment for specimens he had sent to him. Dale may have been somewhat of a patron of Walker's efforts in providing identified material to his collection in much the same fashion as Dale was (in a much larger way) a patron to John Curtis in assisting him with the funding of his *British insects* parts (see Wilson & Walker, 2007).

In his review of the Walker aphid types, Doncaster (1961) gave a history of the Walker material and mentioned autumn 1846 as when Walker appeared to have begun his interest in aphids. This is actually a bit off, as his first paper on the *Aphis* of cow parsnip was in 1835, and Walker also published a large number of small notes on some British aphids in Newman's *Entomologist* in 1841, in which he mentions that he was making notes on their habits in September 1840.

A letter to Dale of 23 November 1846 confirms that Walker had been working at this group for quite some time as Dale had not only sent him specimens for identification but Walker had sent Dale a prospectus of an upcoming 300-page work entitled "Descriptions of British Aphides" to contain 3 or 6 plates and be priced at 8 or 10s:

"A shall be much obliged to you for information as to the Aphides of your neighbourhood, it will be useful to me in my proposed work, of which I take the liberty of sending you a prospectus, & I shall also be indebted to you if you will show it to any of your acquaintance who are likely to be interested in it." (*F. Walker letter to J.C. Dale, 23 November 1846, Oxford Museum Archives, Dale MS 9, Entomological Letter Book, Vol. 2, L-Z*).

Although Dale did sign up as a subscriber, for whatever reasons, the single volume 300-page work did not get published. In its place instead was published by Walker a multi-part series of articles comprising 211 pages from 1848 to 1850 in the *Annals and Magazine of Natural History* and

Newman's *Zoologist* entitled "Descriptions of Aphides". Dale was helpful to Walker in purchasing multiple copies of those works. In those series of articles, a total of some 145 species were described as new, of which only 38 (26%) were later recognized by Doncaster (1961) as valid taxonomically.

Studies on aphids and gall-makers were a life-long interest of Walker and his last paper (Walker, 1876), published posthumously, was a short note on the gall-wasp *Cynips kollari*, fittingly shepherded to publication by long-time friend Edward Newman, in his journal, *The Entomologist*, more than a year after Walker had passed away.

8. The Sale of Specimens to Australia

For many years a number of Walker types and types of others assumed to have been deposited at the British Museum or in other British collections were not found and thought to be lost or destroyed. Then in 1985 Ken Walker (no relation to our biographical subject) of the Museum of Victoria published a note in *Antenna* that solved this riddle (Walker, 1985a)¹. Many of these Walker specimens, as well as others, ended up at the Museum of Victoria, Melbourne through purchases made from Walker.

In an effort to help build the collections of the new Melbourne museum with specimens of various plants and animals, its director, appointed to the post in 1858, Professor Frederick McCoy (1817–1899) (Fig. 25), sent out letters to his large network of scientists and museums worldwide asking them to help procure specimens for his new museum.

Born in Dublin, Ireland, McCoy initially studied medicine but soon turned to paleontology and natural history. In 1854, the University of Melbourne was opening and McCoy was selected to be one of the first four professors there. McCoy taught chemistry, mineralogy, botany, comparative anatomy, physiology, systematic zoology, and paleontology. But all these subjects were being taught without the resources of a museum collection. A government collection existed since 1854 in the La Trobe Street Assay Office in downtown Melbourne, which did not help McCoy, whose university campus was outside of town. Although he requested it be moved to the university, the request to have it moved outside town was not looked upon kindly. Doggedly determined to acquire the collection, McCoy's perseverance with government officials eventually paid off and the collection was moved to the university to rooms allotted by the university for this purpose. McCoy was given control of the museum, although without pay (Fendley, 1974). However, the existing collection was small and relatively insignificant. McCoy wanted it to rank with the major museums of Europe and so began a letter campaign to request his network of colleagues to help in that endeavor.



Figure 25. Frederick McCoy (1817–1899).

One such letter was sent by McCoy to Francis Walker on 24 August 1861 requesting collections of Lepidoptera, Diptera, Homoptera, Hymenoptera, and Neuroptera that contained type material (Walker,

¹ A paper by Goding & Froggatt (1904) mentioned the existence of Walker specimens in Melbourne, but they failed to connect the significance of them as possible type material and instead listed them as “useless” because the same name had been given to different species (ironically, this is the opposite of others who complained that Walker had given multiple names to the same species!).

1985a). Writing from South Grove, Highgate, Walker responded in October 1861 with a 6-page letter to McCoy:

“I feel obliged for the offer you have made & I will do my best to answer your request with regard to the Nat. Hist. Mus^m. at Melbourne. I think it may be well before proceeding further in this matter to mention all that I can do in furtherance of your purpose. With the exception of some Swiss Coleopt^a. & some N. American Insects I possess hardly any exotic species, & tho’ my collection of British insects is extensive, & especially so in Coleopt^a. & in Hymenopt^a. yet my specimens are not set with the exact nicety which is now practised by some Entomologists.” (*F. Walker letter to F. McCoy, 30 October 1861, Museum of Victoria, Melbourne*).

And thus began a 13-year arrangement where Walker would select specimens for McCoy and pack and send them to Melbourne (although the first shipment seems to have not arrived for many months after its original due date), and McCoy would pay invoices (although sometimes not as quickly as Walker might have liked). The agreed remuneration for specimens changed during the thirteen years but initially was set at £1 per 80 named species (duplicates free) plus a percentage on purchase.

McCoy was interested in obtaining types—as he indicated in his original letter of request—and later he wrote Walker that he was additionally hoping to get specimens that A.R. Wallace had been collecting in the Malay Archipelago. Walker responded why he felt he should not pursue McCoy’s request at that particular time:

“... it might hinder the publication of a work in some parts of Oceania managed by him and by Mr Saunders and for which I have engaged to prepare a list of Lepidoptera and Diptera.” (*F. Walker letter to F. McCoy, 24 July 1863, Museum of Victoria, Melbourne*).

Three years later, his summary paper appeared that gave the distribution of Diptera in the “Eastern Archipelago” (Walker, 1866b), and shortly thereafter, Walker wrote to McCoy that he all of a sudden had Wallace specimens to send:

“I have managed to procure for you a very large number of named species, chiefly Asiatic, & expect to obtain a continual supply for a long time to come. I have already many of the species collected by Wallace. (*F. Walker letter to F. McCoy, 22 April 1867, Museum of Victoria, Melbourne*).

Walker was not entirely straightforward to McCoy about the availability of Wallace-collected material as he in fact had personal collections of Wallace material as early as July 1858 according to Wallace’s notebook (Baker, 2001). It may have been that despite the possession of these specimens, Walker was still working on Wallace material into the 1860s and wished to keep all of it in one place close at hand until he was able to provide a synopsis of the distributions of all the identified species (e.g., Walker, 1866a).

Walker (1985a) indicated that a total sum of £245 was sent by McCoy to Walker via the Colonial Office during this period and summarized the approximate number of specimens sent by Walker as slightly more than 8,000 with a breakdown by order as follows: Blattodea (20); Coleoptera (100); Diptera (3,000); Hemiptera (2,300); Hymenoptera (2,000); Lepidoptera (1,300); Orthoptera (200). The Melbourne Museum’s collection of Walker specimens is ripe for study and few have conducted thorough research on their holdings. One such study was of the muscoid Diptera by Pont (2003), who gave a description of the Diptera holdings:

“There are 12 drawers of Diptera, arranged by regions: North America (2 [drawers]), Central and South America (2), Europe (3), Africa (1), Papua (1) and Indo-Malaya (3). Each drawer is packed with specimens, with each species bearing, or placed over, a label in Francis Walker’s handwriting. Generally there is one

specimen per species, but sometimes 3, 4 or even more. The same species is sometimes repeated, reflecting material that Walker identified over a period of some 13 years and sold at different times. There is material described by Walker from the *Insecta Saundersiana* papers ..., recognisable by the characteristic slip of paper with the species name in Walker's handwriting pinned with the specimen. There is even material described in the *Insecta Britannica*, previously thought to be completely lost. Most importantly, the Papuan and Indo-Malayan drawers contain almost exclusively material collected by A.R. Wallace and bearing the characteristic round labels with the abbreviated Wallace localities, e.g. "Mak." for Makassar, "M" for Mysol, etc." (Pont, 2003: 673–674).

Pont's (2003) study gave nomenclatural and taxonomic notes on 10 species of Muscidae and Anthomyiidae for which type material was found in the collection.

Walker (1995b) published a list of almost 750 species of Hemiptera identified by and sent by Walker to McCoy that are contained in the Museum of Victoria collection.

9. Walker and Biogeography

Walker is best known for his work on the taxonomy of various orders of insects but not much has been discussed with regard to his publications on the geographical distribution of the insects. As mentioned previously, Walker's initial experience was with British insects, especially those from his Southgate residences, as well as those he acquired on his trips to continental Europe. Walker's first experience with insects from foreign lands was apparently his treatment of Diptera collected in New Holland¹ (Walker, 1835a) and participating in the description of insects from the voyage to the Straits of Magellan made by Philip Parker King (Walker, 1836). Then, a few years later, when Darwin returned from his voyage on the *Beagle*, he arranged in 1838 for Walker to look at his chalcidoids from collections made on that voyage, especially those from South America and the Galápagos.

Walker's first paper on the biogeography of insects was a short note with the very general title "Note on the geography of insects" (Walker, 1838). This may have been engendered by Walker recently having received Darwin's collection and seeing further examples of southern Hemisphere insects. Walker was keenly interested in how they may be related to each other and to those of Europe. Almost copying the introductory wording in a paper by Doubleday (1835) on the same subject a year earlier, Walker summarized:

"The study of insects along opposite shores of capes and peninsulas, to observe how their mutual likeness increases southward, would be an interesting branch of their geography, which department of Entomology is much neglected." (Walker, 1838: 678).

A hiatus of almost 15 years ensued before Walker wrote his second paper on this subject "Notes on the distribution of insects in geographical regions" (Walker, 1852). The title was ominous, but incredibly misleading. The three-page note only contained a long list of 209 river valleys of the world and made no reference whatsoever to insects. This paper was written toward the end of Walker's short residence in Chepstow, Wales, and possibly a letter to him from the editor asking if there was anything more went unanswered. In any case, the paper remains a mystery as no further parts to it were published by Walker and no errata or explanation was ever published by the editor.

Cataloguing the British Museum insects took up much of Walker's time the next few years. Then in the late 1850s, Walker entered into an arrangement with A.R. Wallace and W.W. Saunders to describe the Diptera and Homoptera collected by Wallace during his years in the Malay Archipelago and apparently his interest was once again aroused. In 1862, Walker published a note on the similarities of Hemiptera of Europe and North America (Walker, 1862a) and in 1866 Walker published a synopsis of the distributional results of the Diptera that he had identified and described deriving from Wallace's collections (Walker, 1866a). A number of letters from Walker to Frederick McCoy at this time regarding his attempt to get McCoy to exchange Australian insects with him also make reference to a keen interest in their faunistics and relationships to species in other areas.

¹ There is no provenance given for any of the specimens Walker studied other than the general location of "New Holland" [= Australia] in the title. Given the year that Walker worked on them (1835–1836), they most probably derived from the insect collections of the Entomological Club, to which Walker was at the time a member (and some years later, curator of its collections). Donors to the collection before 1836 are not recorded (Gilbert, 2005) but the large collection of Edward Newman was listed as one of those donated in 1836 and this may have been the origin of some of this material. Efforts to locate types deriving from this "New Holland" material have proven fruitless and they might have been dispersed to various members when a large portion of the Entomological Club collection was donated to the British Museum in 1844 and members were allowed at that time to take back specimens they had previously donated to the Club.

“I have lately examined a collection of Diptera from the Philippines Islands, & I find that they are mostly different from those of the other Australasian Isles, Borneo, New Guinea, &c, though they are generally allied to them, & the Dipterous Fauna of all these Isles differs from the Australian fauna.” (*F. Walker letter to F. McCoy, 21 November 1862, Museum of Victoria, Melbourne*).

“I much desire that arrangement could be made for the exchange of species as the minute Australian species (especially of Hym., Dipt., & Homopt.^{ra} are almost unknown in England, & a comparison of the forms would be very interesting.” (*F. Walker letter to F. McCoy, 26 May 1863, Museum of Victoria, Melbourne*).

“In Australia the minute Hym.^{tera} especially are almost unknown, & they would be very interesting for comparison for several species collected by Darwin in Australia & in S. America are nearly similar to the British species.” (*F. Walker letter to F. McCoy, 26 January 1865, Museum of Victoria, Melbourne*)

Walker’s interest in this subject and also most likely his work for Wallace caused him to add geographical summaries to some of his later Museum catalogues, which previously were just taxonomic accounts of their holdings. These summaries can be found for the Lepidoptera (Walker, 1866b), “heteropterous Hemiptera” (Walker, 1868b), “Blattaria” (Walker, 1868a), and the “Dermaptera” (Walker, 1871). Walker continued to publish on this subject even into his later years, his last geographical papers being published on Canadian insects (Walker, 1872, 1873a, 1873b, 1873c) and continental European Rhopalocera (Walker, 1874).

10. Later Years and Trouble with Publishers

After initially hoping to get permission from Museum authorities to continue cataloguing efforts with various proposals of additional parts or supplements to previous works and ultimately not getting this approval, the tone of Walker's letters to Frederic McCoy changed. Walker seemed resigned to the fact that he would not be doing cataloguing any longer and said to his Australian correspondent in one letter:

"I am just about to print the 8th & last part of my Cat.^{guc} of Hemiptera & hope to have more leisure for other insects when this task is finished." (*F. Walker letter to F. McCoy, 2 March 1873, Museum of Victoria, Melbourne*).

The criticism of his catalogues may have been the reason Museum authorities stopped the publications by Walker, but there is no evidence of that. In the same letter above, Walker indicates some trace of desperation to McCoy, that he is looking for other work, even if it is outside of entomology.

"I have enquired about comparing the Crustacea & Radiata of Australia with the B.M., & am told that a new position to that effect must be made to Dr. Gray (Zool. Departm^t B.M.)— & that it may possibly be agreed to if the B.M. collection of those classes be thereby increased." (*F. Walker letter to F. McCoy, 2 March 1873, Museum of Victoria, Melbourne*).

However, a position for this work did not become open at the British Museum and Walker never worked on these groups of animals.

For unknown reasons, Walker, in the last few months of his life, indicated to his Australian correspondent, Frederick McCoy, that he was going to be using "*The Entomologist*", edited by his long-time friends Edward Newman, as his venue for publishing:

"My publications are mostly in Newman's periodical, *The Entomologist* in which there are figures of many genera of Hymenopt." (*F. Walker letter to F. McCoy, 20 September 1873, Museum of Victoria, Melbourne*).

Carrington's obituary (1874) also mentions Walker's being somewhat restricted in where he could publish:

"To their honor, be it said, the Linnean and Entomological Societies long ago¹ declined to publish some of his papers, so that the evil was somewhat mitigated, and of late his publications were few outside the Catalogues." (Carrington, 1874: 141).

His last papers show that he either published in only those few journals where the editor was a personal friend (such as Newman) or he published booklets that were printed by friends (such as Newman) or clients and friendly colleagues (such as Janson). Six parts of *Notes on Chalcidiae* (Fig. 26) came out through the auspices of coleopterist/bookseller E.W. Janson, and it these could well have been one of the groups that Walker had hoped he could work on as part of a resurrected or supplemental set of Hymenoptera parts for the Museum catalogue series.

At some point in his later years, Walker's eyesight began to fail (Günther, 1916). It is not known when this began but examination of his correspondence in this study showed that the appearance of his

¹ The last paper published by the Linnean Society was in 1869 and the last by the Entomological Society of London was in 1870.

handwriting changed somewhat in 1873. Ironically, poor eyesight apparently did not stop him from working on the tiny parasitic *Chalcidiae* (which were difficult to distinguish even with a hand lens) and were the subject of one of his last taxonomic papers (Walker, 1875), published posthumously.

Walker's industriousness as a writer and traveler was evident until his last days. He continually worked up groups of insects and submitted papers for publication while also making almost yearly trips within Britain as well as other parts of Europe. In 1870, he traveled to Wales and Ireland; in 1871 he traveled to the Scilly Isles; and in 1872 he spent two months in Italy and the south of France. The trip to the Scilly Isles was the subject of a two-part paper on their insect fauna (Walker, 1872a, 1872b) and the results of his Italy trip were quickly jotted down to become the focus of another multi-part paper (Walker, 1872d, 1873d, 1873e).

Newman (1874b) mentioned that Walker was traveling in Ireland in 1874 when he suddenly fell ill. He returned home to Elm Hall in Wanstead where he passed away on 5 October 1874. The first news of this was by Newman (1874a) who gave a short notice (in his journal *The Entomologist*) at the end of an installment of a translation of oak-galls to which Walker would usually provide annotation to the species listed.

“I was expecting Mr. Walker's notes on the parasites of *Cynips Lignicola*, when the mournful intelligence reached me that his labours were ended, and his observations had ceased forever. I have lost the most able of coadjutors.” (Newman, 1874a: 251).

At the time of his death, there were still a number of papers in the queue in various journals that appeared posthumously. His last paper came out in 1876.

Unpublished Manuscripts. Walker indicated in correspondence to McCoy of intending to publish various works including a list of Diptera and other insects of Australia, supplemental volumes to the British Museum catalogues for Diptera and Hemiptera, and claims in his later years that many of the specimens he was naming in the 1870s for McCoy were to be published “soon”. None of these projects ever saw fruition, and Harvey *et al.* (1996) listed only one unpublished manuscript that exists in the archives of the Entomology Department of the Natural History Museum: a list of Madeiran insects.

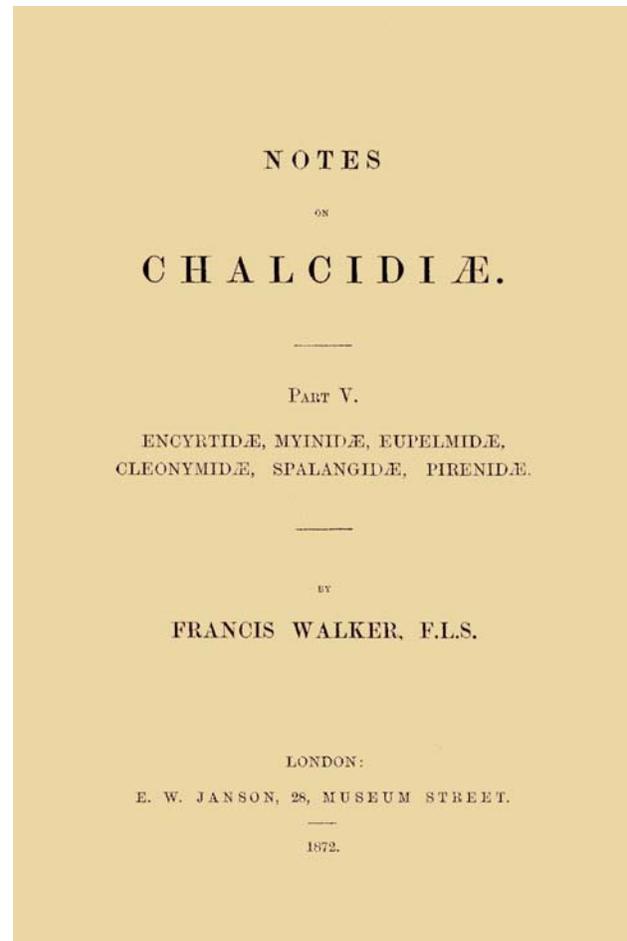


Figure 26. Title page of the fifth volume of *Notes on Chalcidiae* published by Janson in 1872.

11. Putting Walker's Taxonomic Ability in Context

Walker's proclivity of naming and describing insects has resulted in history regarding him in an unflattering light. During his career, he proposed 23,626 new names for insects of a number of orders (Table 2). Some orders were within his area of expertise; others, as he had admitted, were not, but he persevered nonetheless (often to the dismay of specialists in those latter groups).

Table 2. Number of Species Proposed by Walker by Order

<u>Order</u>	<u>Number</u>
Blattodea	417
Coleoptera	440
Diptera	4236
Embiida	1
Ephemeroptera	37
Hemiptera	1415
Homoptera	2487
Hymenoptera	2595
Isoptera	14
Lepidoptera	10644
Mantodea	1
Mecoptera	3
Neuroptera	238
Odonata	1
Orthoptera	963
Psocoptera	7
Thysanoptera	1
<u>Trichoptera</u>	<u>126</u>
Total	23626

However, the criticisms by contemporary colleagues notwithstanding, Walker was in some respects no worse than other entomologists of his time. Stone (1980) made a comparison of dipterists who worked on Nearctic species, and Walker's percent valid species for Nearctic Diptera was estimated at 64% (i.e., out of every 100 species described as new, 36 of them were found to be junior synonyms). This seems high for today's standards, but many other dipterists who have proposed names for Nearctic Diptera had similar or lower percentages of valid species including Harrison Gray Dyar (50%); Charles Henry Tyler Townsend (58%); Pierre-Justin-Marie Macquart (59%); Jacques-Marie-Frangille Bigot (64%); Paul Stein (65%); Camillo Rondani (66%); William George Dietz (66%); Friedrich Moritz Brauer (67%).

A more recent comparison of the productivity and percent validity of taxa described by the top 13 dipterists (in numbers of proposed new species) within all world Diptera was made by Evenhuis & Thompson (2004) based on the world database of Diptera taxa (see Evenhuis *et al.*, 2010 for details on the history and status of this database). Using these data, which in 2004 were much more complete and updated since Stone's comparison, Walker fared better in percent valid species than three other dipterists in that elite list, two of whom who are considered founders and leaders of dipterology. Walker's percent valid was 69% for all Diptera. Dipterists on that list with percentages that were lower: Andre-Johann-Baptiste Robineau-Desvoidy (51%); Pierre-Justin-Marie Macquart (63%); Johann Wilhelm Meigen (64%). The average percent validity for all (more than 4,300) workers of Diptera was 84%.

Percent validity in three other groups of insects was found in revisionary works and databases: Aphids (26%; Doncaster, 1961); Blattodea (54.6%; Beccaloni, 2007); Trichoptera (77.2%; Betten & Moseley, 1960); North American Chalcidoidea (93.2%; Burks, 1975).

The vilification of Francis Walker by his colleagues needs some investigation. Why was he singled out when other contemporary workers with similar rates of synonymy were lauded for their efforts? It seems that the major sources of complaints, even if true, do not explain why he was vilified while others of his contemporary colleagues who were guilty of the same actions were not.

The reasons for him being singled out are further muddled when one notices that Walker was almost universally and genuinely held in high esteem for his kindness, generosity, and friendliness. Even the scathing obituary of Carrington (1874) balances criticism of Walker's taxonomy with praise of his personal carriage:

"In his social relations he was amiability itself, and probably there are few men who have lived to the age of 65 (his age at the time of his death), and made so few enemies. Even those who felt most keenly the disrepute into which he brought the entomological section of our great Natural History Museum, will miss with regret his courteous salutation and simplicity of manner." (Carrington, 1874: 141).

A description of the going's on at a typical meeting of the Entomological Society typify how his colleagues viewed Walker personally:

"That is Mr. Francis Walker, a perfect ambulatory encyclopaedia of entomological knowledge; you will find him very agreeable, and always ready to impart information..." (Stainton, 1856: 106).

A cursory perusal of the complaints seem to indicate they derive from three primary sources: lepidopterists, coleopterists, and heteropterists. As alluded to previously, Stål's (1862) lengthy review of Walker's Homoptera catalogue spends many pages complaining of his inability to properly form names, while giving only a few examples of his taxonomic weakness (see above for one example).

12. Walker and Religion, Cosmology, and Science

Walker's writings outside of biology are few. I have researched numerous journals and society notes to compile as complete a bibliography for Walker as possible and have found mention of only 3 works that are non-biological. I have not been able to trace two of them: the *Sketch of time* (n.d.) and *The stars of the earth* (n.d.)¹, but from Gunther's (1975) implication, the latter appears to have been religious in subject matter. The third, *On unity of system*, is probably the best known of the three.

Although not exhibiting it overtly, Walker was a deeply religious person. The Quaker background of Walker's ancestors was strong and through the years built an intricate network of associates and colleagues in the sciences and arts. Cantor (2005) gave an excellent overview of the little-known but strong scientific history of Quakers in Victorian England. Walker seems to have lived in the midst of it.

The Walker family's strong historical association with the Society of Friends could easily have allowed him to make and keep close friends with other Quaker entomologists such as the Doubleday brothers and Newman. Apparently not a strict Quaker himself, Walker and others of his family were extremely charitable toward the Anglican church as is evidenced by family members either becoming Anglican priests or his daughters and nieces marrying those who became involved in the clergy. Moreover, the family helped provide most of the funds for the building of Christ Church in Southgate on land next to the Walker estate and some of the Walker family were members of the British and Foreign Bible Society and generous contributors to it.

Wallace's researches in the Malay Archipelago that led to his theory of natural selection may have had a strong effect on Walker, who worked on Wallace's collections since 1856 and agreed to report to him with a summary of the biogeographical distribution of the insects he was identifying and describing as new [see Walker (1866a) for such a summary of the Diptera and a lengthy table of species and islands on which they were found]. Wallace's theory, which was independently being developed by Darwin, was incongruent with the religious doctrine of the day and this did not go over well with many of the religious faithful in the scientific realm. Interestingly, in contrast to his friend Edward Newman's open hostility toward the Theory of Evolution in general, and toward Darwin's *Origin of Species* specifically (Newman, 1861), Walker was content to keep a low profile on such matters, possibly to not upset Wallace, who was providing him (via Saunders) with an abundance of material to describe. However, he instead produced short (often anonymous) tracts advocating that nature and natural classification were the products of the Creator.

From 1857 to 1860, Walker produced a work that was published by the Reverend Francis Orpen Morris (1810–1893). This work was published in 12 installments in Morris's journal "*The Naturalist*"² and was entitled "*On unity of system*" (Walker, 1857a, 1857b, 1857c, 1857d, 1857e, 1857f, 1857g, 1857h, 1858a, 1858b, 1859b, 1860). The first 11 parts were published anonymously; only the last part listed Walker as the author. Morris was a well-known ornithologist and entomologist but he was also a staunch anti-Darwinist (Kofoid, 1938) and, despite some minor disagreements on specifics with Walker's statements that he noted in footnotes by the "editor", Morris most likely relished having Walker take to pen to write on this subject, in hopes of further buttressing the belief that all of nature was the result of a perfect design originating from the Creator.

¹ These two untraceable works may in fact not be Walker's but were works to which Walker referred in his *On unity of system* publications.

² The last part, in 1860, was published in Morris's successor to *The Naturalist*: the "*Annals of Natural History and the Naturalist*".

A completely re-written version of the multi-part *On unity of system* with virtually the same title appeared a few years after the last part of his first set of papers as a separately published pamphlet (Fig. 27) (not coincidentally printed by his Quaker friend Newman) (Walker, 1862b)¹.

In an attempt to explain the place of humans and other natural history elements in the world as we experience it, one can adopt either an existential phenomenology approach or a scientific approach (Compton, 1988). The pressures to the religious faithful brought on by this new theory of natural selection possibly drove Walker to help explain the natural world in defense of the religious doctrine in which he was raised. Walker's first version of his *On unity of System* was a verbose treatise that strained to explain nature and geological epochs in relation to the verses of the Christian Bible (primarily those found in the Book of Genesis). The second version (1872) abandoned the lengthy geological epoch discussion in the first version and was instead written more as a set of laws or rules that explained what we see in nature and how it related to the design of the Creator. Walker's tenets followed those of Alexander Humboldt's *Kosmos* (1845–1862), Chambers (1845), John Pringle Nichol (1837), and Powell (1856) in their philosophy and observations of unity within a complexity of nature.

Newman's (1862) review of Walker's second version augmented Walker's discussion of the various tenets with Newman's own complementary or comparative views. Interestingly, Newman proffered that many of Walker's thoughts agreed in principle to those of Charles Darwin's elucidated in the *Origin of Species* (Darwin, 1859) but with distinct differences that essentially distinguished the two based on inclusion or exclusion of a time component.

If Walker was trying to be a philosopher, he failed miserably. Fraser (1890) stated that there are three main areas that philosophers endeavor to explain: God, Man, and Nature. The words of Walker in his *On unity of system* were many but ultimately just as totally futile in explaining God and Nature as taxonomists have found his sometimes verbose descriptions that attempted to explain his species.

Walker's philosophical work seems to have met with little comment other than Newman's (1862) review and, despite sending copies of his pamphlet to a few possibly sympathetic colleagues (a copy to Samuel H. Scudder is one that is available online; another copy was sent to Frederick McCoy as is evidenced in correspondence), was evidently not followed by contemporary or subsequent naturalists.

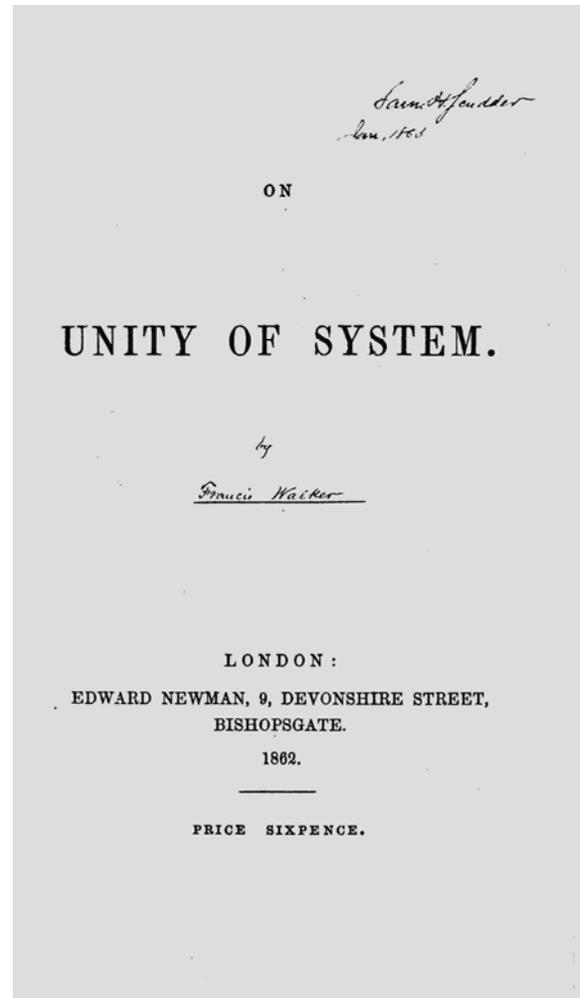


Figure 27. Cover of *Unity of System*. Copy given to Samuel H. Scudder.

¹ The work was published anonymously but is attributed to Walker in bibliographies (and the copy depicted here has Walker's name hand-written as the author).

13. Walker's Collections and Types

Walker continually donated specimens of his collecting as well as specimens he acquired from others to both the Entomological Club (from 1832 on) and later (after 1844) the British Museum. Although a donation of almost 7,000 specimens from the Entomological Club was received by the British Museum in 1844 (Arrow & Hampson, 1906), the Walker Diptera in the collection of the Entomological Club¹ was presented to the British Museum in 1924 (Gilbert, 2005). Despite these generous donations, at the time of his death Walker still had possessed remnants of a collection that was eventually put up for auction. Chalmers-Hunt (1976: 111) indicated that the auction took place on 18 June 1877 at the Stevens auction house in Bloomsbury. Apparently, the collection was split and various portions were purchased by different people throughout Europe. It is not known if any types were dispersed through this auction.

A list of syrphids in the Walker collection seen by G.H. Verrall in 1871 is in the Oxford Museum archives with a note by E.B. Poulton that when he found the box in 1906, it appeared it had been dropped with "specimens and labels mixed indiscriminately". All specimens were destroyed except *Cheilosia olivacea* Zetterstedt, which is now in the British Museum (see Fig. 28).

Arrow & Hampson (1906: 598) gave an excellent breakdown of the material from which Walker described new species and their eventual deposition in the British Museum is summarized here:

- Ceylonese insects: Coleoptera, Orthoptera, Hymenoptera
- British Columbia collected by J.K. Lord: Hymenoptera, Lepidoptera, Coleoptera
- *Insecta Britannica*: Diptera
- Chalcididae
- Moths belonging to W.W. Saunders were purchased in 1894
- Moths from the Congo collected by Chapman

Alleged lost material was also enumerated by Arrow & Hampson (1906: 598) and included Ceylon material from F.L. Layard; D'Urban's South African material; and the material from Egypt and the Red Sea collected by J.K. Lord. The last series of specimens were dealt with by Innes (1912) who provided a list of material found in the School of Medicine in Cairo in 1884.

As mentioned above, from 1861 to 1874, some Walker specimens ended up being purchased by the National Museum of Victoria (Walker, 1985). Other specimens are in a variety of institutions: many Hymenoptera as well as material from W.W. Saunders are in the Oxford University Museum of Natural History (Smith & Taylor, 1964); some specimens from Bengal are in the Devon and Exeter Museums (Flower *in* Hampson, 1898: vi; Horn *et al.* 1990: 412); and Grimshaw (1916) enumerated some Walker types of parasitic Hymenoptera that ended up in the Royal Scottish Museum in Edinburgh through the Greville Collection².

Since Walker, like other entomologists of his era, exchanged specimens with colleagues, the possibility exists of type specimens being found in the collections of other contemporary entomologists. One such cache of Walker specimens and types in the National Museum of Ireland

¹ The initial donation to the British Museum of the insect collection of the Entomological Club in 1844 contained only 177 Diptera (Arrow & Hampson, 1906)

² Greville, Robert Kaye (1794–1866). Primarily a mycologist, bryologist, and botanist.

In Mr. Walker's collection I have seen 22/1/71.

Syrphus *iberici*. one ♂ labelled *arcuatus* another *iberici*
 — *glaucois* ♀♀ labelled *glaucois*
 — *albatrivatus* (2) one labelled. n. sp.
 — *virgipennis*
 — *umbellatarum* (1)
 — *cordae* one labelled *tephricus*, there *cordae*
 — *nitidicollis* (1 ♀)
 — *balteatus*
 — *luniger* (1) so labelled
 — *lunulatus* (1)
 — *auricollis* one ♂ labelled *decorus*
 — *cautellus* (2)
 — *annulatus* (1) Zett var 3 ♀ labelled *dilatatus*
Melanotoma *scalaris* one ♂ labelled *mellaris*, one ♀ *mellitarsus*
 — *mellina*. one ♂ labelled *scalaris*
Platychirus *marginatus*.
 — *unmarginatus* ♂.
 — *albivannus* 3 so called.
 — *scutatus* 2 ♀
 — *scambus* ♂
 — *chryseus* (some so labelled)
Chalcid *variabilis* (2) one ♂ labelled *variabilis*
 — ~~1 ♂ (1 ♂ - common)~~
 — *antiqua*. (2 ♀)
 — *scutellata* (1 ♀)
 — *fulchripes* 4 ♀ one labelled *chlorus* (large) one n. sp. (very small)
 — *maculata* 3 ♂.
 — *favimana*. (6) one ♂ labelled *vulpinus* one ♀ *vidua*
 — *chloris* 2 ♂ ♀
 — *grasa* (1)
 — *vernalis*? one ♀ labelled *viduata*. (one *nigripes*? = sp. n. *decidua*)
 — *mutabilis* 2 ♂
 — melanoid *Syrphus* = labelled *funeralis*
Blasiphia *bicolor* (1)
Rhynchosia *compertus* (1)
Eristalis *testinax* (1 ♀)
 — *nemorum* (1 ♀ ♀) 2 labelled *rupium*
 — *sepulchralis* (1)
 — *arbutorum*

1. *Helophorus* *florus*
Zygota *cegnis* (1)
Syrphoctonus *fulvipes*
 ? head of *S. melleiformis* (very small body)
 labelled *umbellatarum*
Orthoneura *elegans* (1 ♀)
Chrysogaster sp? labelled New York
 — *splendens* 1 ♂
 — *metallina* a male
 labelled *metallina* & a female
decidua
 — *Macquarti* (one ♀ labelled *metallina*)
 — *viduata*.
 — *cameterorum* so labelled
Dipiza *neotitica* (2 ♀) pale winged
 labelled *lucida* one
 called *signata*
Ememodon *acuminata* 2 ♀ labelled
metallina
Dipuzella *viridis* (one labelled *decorus*)
Daragast *tibialis* (1) labelled *femorata*
albifrons.
Sphaerophoria *scripta* ♀
 — *perita* & var? ♀
 — *menthastris* 1 ♂
 — *tanistis* 5 ♀ labelled
mellina
 — *strigatus* 3 ♂ from Jersey

No. 10000
 G.H. Verrall's list of F. Walker's Syrphids
 from 16 Hope Square
 It was evident that box had been
 dropped & insects & labels mixed
 up & I was unable to find original specimens to him
 etc. Chalcid
 & etc. in Box
 16 Hope Square
 E.B. Poulton
 1906

Figure 28. List of syrphids in the Walker Collection seen by G.H. Verrall in 1871 and a note on their fate by E.B. Poulton in 1906. Oxford Museum Archives.

obtained through exchange¹ with Walker's friend and colleague, A.H. Haliday, was discussed by Graham (1984) in his work on Madeiran parasitic Hymenoptera; and has been treated in other articles (e.g., O'Connor & Nash, 1982; Notton & O'Connor, 2004; Mineo *et al.* 2010).

Studies of Walker types are numerous and are essential when revising taxa that include his names due in large part to the often-encountered vague or indecipherable descriptions he gave for his new species. I present here a list of as many types studies as I could find for each group of insects. These lists are in no way complete since many revisionary works mention examination of Walker type material within the narratives but are not always evident from the title or abstract. However, those listed here hopefully include at a minimum most of the major type studies.

Blattodea

Shelford (1907); Princis (1957, 1958, 1959).

Coleoptera

Bates (1886; Sri Lankan geodephagous species); Olliff (1886; Sri Lankan Clavicornia); Blair (1921; Heteromera); Thomas *et al.* (2014; Tenebrionidae).

Diptera

Stein (1901; European Anthomyiidae); Austen (1907; Muscidae); Patton (1922; Oriental Calliphorinae); Johannsen (1926; North American Mycetophilidae); Aldrich (1931; North American Tachinidae); Hockett (1934, North American Anthomyiidae); Parent (1934, Dolichopodidae); Hardy (1956; Bibionidae); Hardy (1959; Tephritidae); Byers (1961; North American Tipulidae); Foote (1964; New World Tephritidae); Emden (1965; Indian Muscidae); Hardy (1966; Tephritidae); Pont (1966; New Guinea Muscidae); Stuckenberg (1966; Australasian Lauxaniidae); Stuckenberg (1968; *Asilus alastor*); Delfinado & Hardy (1971; Philippine Diptera); Smith (1971; North American Empididae); Hockett (1971, 1972; North American Anthomyiidae, Muscidae); Crosskey (1974; British Tachinidae); Lopes (1975; American Sarcophagidae, Calliphoridae); Lopes & Kano (1979; Oriental Sarcophagidae); Lopes (1985; Sarcophagidae); Thompson (1988; *patria ignota* Diptera); Bächli & Vilela (1991; *Drosophila immatura* and *D. remota*); Hancock (1998; Tephritidae); Pont (2003; Muscidae, Anthomyiidae).

Ephemeroptera

Spieth (1940; North American spp.); Kimmins (1960).

Hemiptera: Auchenorrhyncha and Sternorrhyncha

Stål (1862); Distant (1899a, 1899b, 1899c, 1904; Rhynchota); Funkhouser (1923; U.S. and Canadian Membracidae); Ball & China (1933; *Draeculacephala*); Doncaster (1961; Aphididae); Stroyan (1978; Aphididae); Kormilev (1985; Aradidae); Medler (1986; Flatidae); Lansbury (1990; Saunders's collections); Medler (1990; Flatidae); Hancock (1978; Aphididae); Carvalho & Webb (2005; Cercopidae); Gnezdilov & Wilson (2006; *Scantinus*).

Hemiptera: Heteroptera

Tsai & Rédei (2009; Taiwan Pentatomidae).

¹ Correspondence from Walker to J.C. Dale indicates that Walker made collections of many "Chalcidites" and "Aphides" from his various residences subsequent to their original description, and sold them to some of his network of correspondents. Thus, the finding of a Walker "specimen" that may match the type locality, may in fact not be part of a syntype series unless the original dates match.

Hymenoptera

Westwood (1883; Agaonidae); Grimshaw (1916; Chalcididae, Prototrupidae); Donisthorpe (1932; Sri Lankan Formicidae); Hincks (1950; Mymaridae); Graham (1956a, 1956b, 1957, 1969; Pteromalidae); Kereich (1961; Eulophidae); Burks (1975; North American Chalcidoidea); Graham (1979, 1982; Mymaridae); Fergusson (1984; Scelionidae); Vlug & Graham (1984; Platygasteridae); Vlug (1985; Platygasteridae); Bouček (1988; Chalcidoidea); Graham (1991; Eulophidae); Baker (1993; Apoidea); Dathe (1995; *Hylaeus* bees); Baker (1996; J.K. Lord material); Huber & Bouček (2001; Mymaridae); Notton & O'Connor (2004; Diapriidae); Gibson (2005; *Balcha* wasps); Mineo *et al.* (2010; Irish Scelionidae).

Lepidoptera

Grote & Robinson (1868; North American Lepidoptera); Packard (1873; North American Pilaenidae, Pyralidae); Grote (1877; Canadian moths); Fernald (1879; North American Tortricidae); Grote (1882; North American Noctuidae); Hulst (1887; Geometridae); Smith (1891; Noctuidae); Grote (1892); Smith (1892; Heterocera); Swinhoe (1892; Eastern and Australian Heterocera); Schaus (1896; Oxford Museum Lepidoptera types); Lyman (1901; *Spilosoma congrua*, etc.); Barnes & McDunnough (1916; North American Geometridae); Fletcher (1926; Pterophoridae); Miller (1971; *Phaneta refusana*); Nakamura (1977; Egyptian and Sinai Lycaenidae); Becker (1981; *patria ignota* gelechioids); Miller (1985, *Pammene perstructana*); Maes (1997; *Euclasta defamatalis*); Becker (2001; Neotropical Bombycoidea); Patrick *et al.* (2010; New Zealand Geometridae); Pinheiro & Duarte (2010; Noctuidae).

Neuroptera

McLachlan (1868).

Trichoptera

Betten & Moseley (1940); Nimmo (1982; North American *Hydropsyche*).

14. Postscript: “Something of a Mystic”

Although J.E. Gray employed and worked alongside Walker for more than 30 years, Gunther (1975) asserted that Gray never understood him and that his private and unassuming nature caused him to remain an enigma. Gray thought Walker’s theological writings to be more obtuse than Swedenborg and that, with regard to those tracts that were more philosophical in nature, Gunther (1975) alleged that he was “something of a mystic”¹.

Without more personal accounts than what I have been able to find and relate here, it is indeed difficult to provide an accurate assessment of Walker, the man. His correspondence give evidence that he had an extreme obsession with describing and naming new species and was most generous in his help of others whenever they required identifications or descriptions of species in their collections. Whether his penchant for naming new species was vanity or simply a genuine love of the aesthetics of taxonomy and nomenclature will have to be left to future research.

¹ The term “mystic” may not be an accurate label for Walker since he never wrote his theological tracts as someone attempting to attain unity with the divine through self-surrender but instead wrote more as a philosopher.

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- Walker, F. (1873b) On the geographical distribution of some genera of Canadian insects [part]. *Canadian Entomologist*, 5, 43–44.
- Walker, F. (1873c) On the geographical distribution of some genera of Canadian insects [concl.]. *Canadian Entomologist*, 5, 77–78.
- Walker, F. (1873d) Notes on some insects of Italy and of South France, observed between the middle of May and the middle of July, 1872 [part]. *The Entomologist* 6, 278–281.
- Walker, F. (1873e) Notes on some insects of Italy and south France, observed between the middle of May and the middle of July, 1872 [concl.]. *The Entomologist* 6, 303–308.
- Walker, F. (1874) Geographical distribution of continental Rhopalocera. *The Entomologist*, 7, 75–79.
- Walker, F. (1875) Descriptions of new genera and species of parasites, belonging to the families Proctotrupidae and Chalcididae, which attack insects destructive to the fig in India. *The Entomologist*, 8, 15–18.
- Walker, F. (1876) The Devonshire gall, *Cynips kollari*. *The Entomologist*, 9, 52–54.
- Walker, K. (1985a) Mystery of Francis Walker specimens solved. *Antenna*, 9, 78–80.
- Walker, K. (1985b) Mystery of Francis Walker specimens solved. *Tymbal*, 5, 9–15.
- Wallace, A.R. (1903) The dawn of great discovery. My relations with Darwin in relation to the theory of natural selection. *Black and White*, 1903, 78.
- Westwood, J.O. (1863) [Obituary] John Curtis. *Proceedings of the Entomological Society of London*, 1863, xxxi–xlvi.
- Westwood, J.O. (1883) Further descriptions of insects infesting figs. *Transactions of the Entomological Society of London*, 1883, 29–48.
- Wheeler, G.D.C. (1912) On the dates of publication of the Entomological Society of London. *Transactions of the Entomological Society of London*, 1911, 750–767. [10 February]
- Wilson, M.R. & Walker, K. (2007) John Curtis and his leafhoppers with nomenclatural notes on some species (Hemiptera, Auchenorrhyncha, Cicadellidae) with special reference to the status of *Eupteryx solani* Curtis 1846. *Acta Entomologica Slovenica*, 15(2), 161–170.
- Woodward, B.B. (1897) Saunders, William Wilson, pp. 331–332. In: Lee, S. (ed.), *Dictionary of National Biography*. Vol. L. Russen—Scobell. Smith, Elder & Co., London. vi + 456 pp.
- Zeller, P.C. (1872) Beiträge zur Kenntniss der nordamerikanischen Nachfalter, besonders der Microlepidopteren. *Verhandlungen der K.-k. Zoologisch-Botanischen Gesellschaft in Wien*, 22, 447–572.

Appendix I. Complete Bibliography of Francis Walker

Walker authored almost 500 notes, articles, and books in his 44 years of active taxonomic work, including a few papers published posthumously that were in press when he died. All published papers that could be found attributable to Walker are listed here. These also include published notes presented at meetings that most times involved novel observations, and include a few papers that were “presented” but never published. Sometimes these notes do not enter into a person’s “formal” bibliography, but as those listed here are attributable to Walker and involve biological information for which he was responsible, they are included to make this bibliography as complete as possible.

Works are listed in the chronological order in which they were published. Dates of publication were researched for every article and are given in square brackets after the article citation. Those for which no more accurate information could be found other than the year are given as “31 December+” to differentiate from actual 31 December publication dates. Dates without annotations are taken from dating within the publication itself. For publication in which no information other than the month could be found, these are assumed to have been published on the last day of that month. Annotations are given for sources of external dating information as well as any other clarifications of the publication as necessary.

1832

Monographia Chalcidum [part]. *Entomological Magazine*, 1, 12–29. [before 8 September]
[Date recorded in the *London Literary Gazette*.]

1833

Monographia Chalcidum [part]. *Entomological Magazine*, 1, 115–142. [January]
Observations on the British species of Sepsidae. *Entomological Magazine*, 1, 244–256. [April]
Monographia Chalcidum [part]. *Entomological Magazine*, 1, 367–384. [July]
Monographia Chalcidum [part]. *Entomological Magazine*, 1, 455–466. [October]

1834

Monographia Chalciditum [part]. *Entomological Magazine*, 2, 13–39. [January]
[This is the continuation of the series with the previous title of “Monographia Chalcidum”.]
List of a few insects observed in Devonshire and Cornwall during the month of September, 1833.
Entomological Magazine, 2, 117–118. [January]
Monographia Chalciditum [part]. *Entomological Magazine*, 2, 148–179. [April]
Observations on the British species of Pipunculidae. *Entomological Magazine*, 2, 262–270. [July]
Monographia Chalciditum [part]. *Entomological Magazine*, 2, 286–309. [July]
Monographia Chalciditum [part]. *Entomological Magazine*, 2, 340–369. [October]
A list of described Diptera new to Britain. *Entomological Magazine*, 2, 439. [October]

1835

Characters of some undescribed New Holland Diptera. *Entomological Magazine*, 2, 468–473.
[January]
Monographia Chalciditum [part]. *Entomological Magazine*, 2, 476–502. [January]
Descriptions of some British species of *Anacharis*. *Entomological Magazine*, 2, 518–522. [January]
Descriptions of the British Tephritites. *Entomological Magazine*, 3, 57–85. [April]
Monographia Chalciditum [part]. *Entomological Magazine*, 3, 94–98. [April]

- Observations on the British Cynipites. *Entomological Magazine*, 3, 159–170. [July]
 Notes on Diptera. *Entomological Magazine*, 3, 178–182. [July]
 Monographia Chalciditum [part]. *Entomological Magazine*, 3, 182–206. [July]
 The *Aphis* of the cowslip. *Entomological Magazine*, 3, 208. [July]
 [Authored under the pseudonym “Tot”.]
 On the species of *Platygaster*, &c. *Entomological Magazine*, 3, 217–274. [October]

1836

- On the species of *Teleas*. *Entomological Magazine*, 3, 341–370. [January]
 Notes on the genus *Aphis*. *Entomological Magazine*, 3, 405–407. [January]
 Notes on some insects of Teneriffe. *Entomological Magazine*, 3, 412. [January]
 Monographia Chalciditum [part]. *Entomological Magazine*, 3, 465–496. [April]
 Diptera, pp. 331–359. In: Curtis, J., Haliday, A.H. & Walker, F., Descriptions &c. of insects collected by Captain P.P. King, R.N., F.R.S., in the Survey of the Straits of Magellan. *Transactions of the Linnean Society of London*, 17, 315–359. [21 June]
 Monographia Chalciditum [part]. *Entomological Magazine*, 4, 9–26. [July]
 Characters of two undescribed British Coleoptera. *Entomological Magazine*, 4, 83. [July]
 Notes on Diptera. *Entomological Magazine*, 4, 113–117. [October]
 Notes on the genus *Aphis*. *Arcana of Science and Art*, 9, 211–213. [31 December+]
 [Reprinted version of the same article that appeared, 1836, in *Entomological Magazine*, 3, 405–407.]

1837

- Notes on Diptera. *Entomological Magazine*, 4, 226–230. [January]
 Monographia Chalciditum [part]. *Entomological Magazine*, 4, 349–364. [April]
 On the Dryinidae, &c. *Entomological Magazine*, 4, 411–435. [July]
 Monographia Chalciditum [part]. *Entomological Magazine*, 4, 439–461. [July]
 [Entomological remarks]. In: Christy, W., Notes of a voyage to Alten, Hammerfest, &c. *Entomological Magazine*, 4, 462–483. [July]
 Monographia Chalciditum [part]. *Entomological Magazine*, 5, 35–55. [October]

1838

- Monographia Chalciditum. *Entomological Magazine*, 5, 102–118. [January]
 Descriptions of British Chalcidites [part]. *Annals of Natural History*, 1, 307–312. [1 June]
 [Dated from Evenhuis (2003).]
 Descriptions of British Chalcidites [part]. *Annals of Natural History*, 1, 381–387. [1 July]
 [Dated from Evenhuis (2003).]
 Descriptions of British Chalcidites [part]. *Annals of Natural History*, 1, 449–454. [1 August]
 [Dated from Evenhuis (2003).]
 Monographia Chalciditum. *Entomological Magazine*, 5, 418–431. [October]
 Descriptions of some Oxyuri. *Entomological Magazine*, 5, 453–458. [October]
 Description of some Chalcidites discovered by C. Darwin, Esq. *Entomological Magazine*, 5, 469–477. [October]
 Varieties. 1. Species of *Encyrtus*. *Entomological Magazine*, 5, 518. [October]
 Descriptions of British Chalcidites [part]. *Annals of Natural History* 2, 198–205. [1 November]
 [Dated from Evenhuis (2003).]

Note on the geography of insects. *Magazine of Natural History*, (n.s.) 2, 677–678. [1 December]
[Dated from Evenhuis (2003).]

1839

- Descriptions of British Chalcidites [part]. *Annals of Natural History* 2, 350–355. [1 January]
[Dated from Evenhuis (2003).]
- Descriptions of British Chalcidites [part]. *Annals of Natural History* 3, 177–182. [1 May]
[Dated from Evenhuis (2003).]
- Descriptions of British Chalcidites [part]. *Annals of Natural History* 3, 415–419. [1 August]
[Dated from Evenhuis (2003).]
- Descriptions of British Chalcidites [part]. *Annals of Natural History* 4, 29–32. [1 September]
[Dated from Evenhuis (2003).]
- Descriptions of British Chalcidites [part]. *Annals of Natural History* 4, 232–236. [1 December]
[Dated from Evenhuis (2003).]
- Monographia Chalciditum*. Vol. I. Baillière, London. 333 pp. [31 December+]
- Monographia Chalciditum*. Vol. II. Baillière, London. 100 pp. [31 December+]

1841

- Aphis Sonchi*. *The Entomologist*, 1, 127. [June]
- Aphis Danci*. *The Entomologist*, 1, 127. [June]
- Tachinus bipustulatus*. *The Entomologist*, 1, 128. [June]
- Ptinus crenatus*. *The Entomologist*, 1, 128. [June]
- Cryptophagus cellaris*. *The Entomologist*, 1, 128. [June]
- Julus terrestris*. *The Entomologist*, 1, 128. [June]
- Descriptions of some new species of Chalcidites in the collection of John Curtis. *The Entomologist*, 1,
133–135. [July]
- Laphria nigra*. *The Entomologist*, 1, 160. [August]
- Note on Myriapoda. *The Entomologist*, 1, 172. [September]
- Aphis* of the peach. *The Entomologist*, 1, 172–173. [September]
- Aphis* of the currant. *The Entomologist*, 1, 173. [September]
- The *Aphis* of the cherry. *The Entomologist*, 1, 173. [September]
- Aphis* of the turnip. *The Entomologist*, 1, 173. [September]
- Aphis* of the sow-thistle. *The Entomologist*, 1, 173. [September]
- Aphis* of the oak. *The Entomologist*, 1, 173. [September]
- The *Aphis* of the bean. *The Entomologist*, 1, 173. [September]
- Aphis* of the sycamore. *The Entomologist*, 1, 173. [September]
- Aphis* of the apple-tree. *The Entomologist*, 1, 173. [September]
- Lachnus*. *The Entomologist*, 1, 173. [September]
- Aphis* of *Alisma*. *The Entomologist*, 1, 207. [November]
- Aphis* of the lettuce. *The Entomologist*, 1, 207. [November]
- Aphis* of the potato. *The Entomologist*, 1, 207. [November]
- Musquito cave, (extracted from Paget’s ‘Travels in Hungary’). *The Entomologist*, 1, 207–208.
[November]
- Notes on Virey’s “system of animal structure”. *The Entomologist*, 1, 211–215. [December]
- Descriptions of Chalcidites. *The Entomologist* 1, 217–220. [December]

1842

- Notes on Myriapoda [part]. *The Entomologist*, 1, 237–243. [January]
- Notes on Myriapoda. *The Entomologist*, 1, 293–296. [April]
- Note on *Porcellio*. *The Entomologist*, 1, 307. [May]
- Metamorphosis of insects. *The Entomologist*, 1, 307. [May]
- Description of Chalcidites. *The Entomologist*, 1, 334–339. [July]
- The gaz or gazu. *The Entomologist*, 1, 244. [July]
- Descriptions of Chalcidites discovered by C. Darwin, Esq., near Valparaiso. *Annals and Magazine of Natural History*, 10, 113–117. [1 October]
[Dated from Evenhuis (2003).]
- Descriptions of Chalcidites discovered in Valdivia by C. Darwin, Esq. *Annals and Magazine of Natural History*, 10, 271–274. [1 December]
[Dated from Evenhuis (2003).]
- [Explanation of plates A–P (illustrations of genera of Chalcidoidea by Haliday).] *The Entomologist*, 1, v–vi. [December]
[For details on authorship of this, see Graham, 1987, *Entomologist's Monthly Magazine*, 123, 185–189.]

1843

- Description of Chalcidites discovered near Concepcion, in South America, by C. Darwin, Esq. *Annals and Magazine of Natural History*, 11, 30–32. [January]
[Dated from Evenhuis (2003).]
- Descriptions of Chalcidites found near Lima by C. Darwin Esq. *Annals and Magazine of Natural History*, 11, 115–117. [1 February]
[The end of the article says “to be continued” but there are no further articles on this subject. Dated from Evenhuis (2003).]
- Descriptions of Chalcidites discovered in the Isle of Chonos by C. Darwin, Esq. *Annals and Magazine of Natural History*, 11, 184–185. [1 March]
[Dated from Evenhuis (2003).]
- Descriptions of Chalcidites discovered in Coquimbo by C. Darwin, Esq. *Annals and Magazine of Natural History*, 11, 185–188. [1 March]
[Dated from Evenhuis (2003).]
- Note on the larva of *Cis Boleti*, Newman. *The Zoologist*, 1, 116. [1 April]
- Note on *Heliothrips adonidum*. *The Zoologist*, 1, 123. [1 April]
- Descriptions of Chalcidites discovered by C. Darwin, Esq. *Annals and Magazine of Natural History*, 12, 45–46. [1 July]
[Dated from Evenhuis (2003).]
- Descriptions of Chalcidites discovered in St. Vincent's Isle by the Rev. Lansdown Guilding. *Annals and Magazine of Natural History*, 12, 46–49. [1 July]
[Dated from Evenhuis (2003).]
- Descriptions of some new species of Chalcidites. *Annals and Magazine of Natural History*, 12, 103–104. [1 August]
[Dated from Evenhuis (2003).]
- Description des Chalcidites trouvées au Bluff de Saint-Jean, dans la Floride orientale, par MM. E. Doubleday et R. Forster. *Annales de la Société Entomologique de France*, (2) 1, 145–162. [September]
[Dated from C.D. Sherborn MS notes in British Museum.]

1844

Descriptions of some Chalcidites of North America, collected by George Barnston, Esq. *Annals and Magazine of Natural History*, 14, 14–17. [1 July]

[Dated from Evenhuis (2003).]

Descriptions of some British Chalcidites [part]. *Annals and Magazine of Natural History*, 14, 18–22. [1 July]

[Dated from Evenhuis (2003).]

Descriptions of some British Chalcidites [concl.]. *Annals and Magazine of Natural History*, 14, 181–185. [1 September]

[Dated from Evenhuis (2003).]

On the species of Chalcidites inhabiting the Arctic Region [part]. *Annals and Magazine of Natural History*, 14, 331–342. [1 November]

[Dated from Evenhuis (2003).]

On the species of Chalcidites inhabiting the Arctic Region [concl.]. *Annals and Magazine of Natural History*, 14, 407–410. [1 December]

[Dated from Evenhuis (2003).]

1845

On the habits of some Chalcidites. *The Zoologist*, 3, 848–850. [February]

Parasitism of *Pteromalus domesticus*. *The Zoologist*, 3, 850. [February]

Parasites of *Microgaster glomeratus*, Linn. *The Zoologist*, 3, 850. [February]

Characters of undescribed species of British Chalcidites. *Proceedings of the Linnean Society of London*, 1, 261–263. [6 May]

[Dated from Kappel (1896).]

Notes on the variations and structures in the British species of Eurytomidae. *Annals and Magazine of Natural History*, 15(Supplement), 496. [1 July]

[Summarized, 1849, in *Journal and Proceedings of the Linnean Society of London*, 1, 233. Dated from Evenhuis (2003).]

Parasitism of Chalcidites [part]. *The Zoologist*, 3, 1010. [July]

Larvae of the species of *Astyages*. *The Zoologist*, 3, 1087. [September]

Parasitism of Chalcidites [part]. *The Zoologist*, 3, 1092. [September]

Parasitism of Chalcidites [part]. *The Zoologist*, 3, 1142. [October]

Parasitism of Chalcidites [part]. *The Zoologist*, 3, 1158. [November]

The Hessian fly. *The Zoologist*, 3, 1999–1200. [December]

1846

Characters of some undescribed species of Chalcidites. *Annals and Magazine of Natural History* 17, 108–115. [1 February]

[Dated from Evenhuis (2003).]

Additional notes on *Tetrastichus*. *The Zoologist*, 4, 1232. [February]

Parasitism of Chalcidites [concl.]. *The Zoologist*, 4, 1233–1234. [February]

Note on *Pteromalus puparum*. *The Zoologist*, 4, 1235–1236. [February]

Notes on the species of *Haltica*. *The Zoologist*, 4, 1239. [February]

Characters of some undescribed species of Chalcidites. (Continued.) *Annals and Magazine of Natural History*, 17, 177–185. [1 March]

[Dated from Evenhuis (2003).]

List of the specimens of hymenopterous insects in the collection of the British Museum. Part I.—Chalcidites. British Museum, London. vii +[1] + 100 pp. [4 April]

- [Dated from Sherborn, 1926, *Ann. Mag. Nat. Hist.* (9) 17, 271–272; Pages 99–100 are the index and apparently were later (in Part II) considered to not be part of the text pagination as it continues on from page 99 (*q.v.*).]
- Oak-apples in America. *The Zoologist*, 4, 1281–1282. [April]
- Notes on Aphides with reference to the plants on which they feed. *The Zoologist*, 4, 1288–1292. [April]
- Empis borealis*. *The Zoologist*, 4, 1354. [June]
- Callimome versicolor*. *The Zoologist*, 4, 1356–1357. [June]
- Rhodites of the rose-gall. *The Zoologist*, 4, 1359. [June]
- Descriptions of the Mymaridae. *Annals and Magazine of Natural History*, 18, 49–54. [1 July]
[Dated from Evenhuis (2003).]
- Proposed work on aphides. *Annals and Magazine of Natural History*, 18, 143. [1 August]
[Dated from Evenhuis (2003).]
- Descriptions of Chalcidites. *Transactions of the Linnean Society of London*, 20, 153–162. [18 August]
[Dated from Raphael, 1970, *Biol. J. Linn. Soc.* 2: 61–76.]
- List of insects inhabiting oak-apples [part]. *The Zoologist*, 4, 1454–1457. [September]
- Notes on oak-galls. *The Zoologist*, 4, 1457–1458. [September]
- Description of *Eulophus Agathyllus*. *The Zoologist*, 4, 1458. [September]
- American blight. *The Zoologist*, 4, 1461. [September]
- On the *Aphis* of the hop or hopfly. *The Zoologist*, 4, 1461. [September]

1847

- Notes on some Chalcidites and Cynipites in the collection of the Rev. F.W. Hope. *Annals and Magazine of Natural History*, 19, 227–231. [1 April]
[Dated from Evenhuis (2003).]
- Remarkable aberrant structure in specimen of *Callimome*. *The Zoologist*, 5, 1661. [April]
- Rose-galls, or robin's pincushions. *The Zoologist*, 5, 1661. [April]
- Characters of undescribed Chalcidites collected in North America by E. Doubleday, Esq., and now in the British Museum. *Annals and Magazine of Natural History*, 19, 392–398. [1 June]
[Dated from Evenhuis (2003).]
- Characters of undescribed Chalcidites collected in North America by E. Doubleday, Esq., and now in the British Museum. *Annals and Magazine of Natural History*, 20, 19–29. [1 July]
[Dated from Evenhuis (2003).]

1848

- Notes on Aphides. *Transactions of the Entomological Society of London*, 5, 60–61. [12 January]
[Dated from Wheeler (1912).]
- List of insects produced from oak-apples [part]. *The Zoologist*, 6, 1995. [February]
- List of the specimens of hymenopterous insects in the collection of the British Museum*. Part II. — Chalcidites. Additional species. British Museum, London. Pp. iv + 99–237. [13 May]
[Dated from Sherborn, 1926, *Ann. Mag. Nat. Hist.* (9) 17, 271–272.]
- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 1, 249–260. [1 April]
[Dated from Evenhuis (2003).]
- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 1, 328–345. [1 May]
[Dated from Evenhuis (2003).]
- On the migrations of Aphides. *Annals and Magazine of Natural History*, (2) 1, 372–373. [1 May]
[Dated from Evenhuis (2003).]
- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 1, 443–454. [1 June]

- [Dated from Evenhuis (2003).]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 2, 43–48. [1 July]
 [Dated from Evenhuis (2003).]
 Notes on Diptera, Chalcidites, and other insects. *Annals and Magazine of Natural History*, (2) 2, 73–78.
 [1 July]
 [Dated from Evenhuis (2003).]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 2, 95–109. [1 August]
 [Dated from Evenhuis (2003).]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 2, 190–203. [1
 September]
 [Dated from Evenhuis (2003).]
 Notes on Diptera, Chalcidites, and other insects. *Annals and Magazine of Natural History*, (2) 2,
 218–220. [1 September]
 [Dated from Evenhuis (2003).]
 Descriptions of Aphides [part]. *The Zoologist*, 6, 2217–2221. [29 October]
 Descriptions of Aphides [part]. *The Zoologist*, 6, 2246–2252. [28 November]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 2, 421–431. [1
 December]
 [Dated from Evenhuis (2003).]
List of specimens of dipterous insects in the collection of the British Museum. Part I. British Museum,
 London. 229 pp. [9 December]

1849

- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 3, 43–53. [1 January]
 [Dated from Evenhuis (2003).]
 Notes on Chalcidites, and descriptions of various new species. *Annals and Magazine of Natural
 History*, (2) 3, 204–210. [1 March]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 3, 295–304. [1 April]
 [Dated from Evenhuis (2003).]
List of specimens of dipterous insects in the collection of the British Museum. Part II. British Museum,
 London. Pp. [3] + 231–484. [21 April]
 [Dated from Sherborn, 1926, *Ann. Mag. Nat. Hist.* (9) 17, 271–272.]
List of specimens of dipterous insects in the collection of the British Museum. Part III. British Museum,
 London. Pp. [3] + 485–687. [30 June]
 [Dated from Sherborn, 1926, *Ann. Mag. Nat. Hist.* (9) 17, 271–272.]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 4, 41–48. [1 July]
 [Dated from Evenhuis (2003).]
 Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 4, 195–202. [1
 September]
 [Dated from Evenhuis (2003).]
 Descriptions of new British Aphides [part]. *The Zoologist*, 7(Appendix), xxxi–xl. [28 September]
 [Dated from Evenhuis (2003).]
 Descriptions of new British Aphides [part]. *The Zoologist*, 7(Appendix), xliii–lvii. [29 October]
List of specimens of dipterous insects in the collection of the British Museum. Part IV. British Museum,
 London. Pp. [3] + 688–1172. [8 December]
 [Dated from Sherborn, 1926, *Ann. Mag. Nat. Hist.* (9) 17, 271–272.]
 Notice of the hopfly. *The Zoologist*, 7, 2555. [31 December+]
 [Description of the hop-fly *Aphis Humuli*, Schrank], pp. 71–73. In: Newman, E., *The letters of Rusticus
 on the natural history of Godalming*, extracted from the *Magazine of Natural History*, the

Entomological Magazine, *and the Entomologist*. Van Voorst, London. viii + 164 pp. [31 December+]

1850

- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 5, 14–28. [1 January]
[Dated from Evenhuis (2003).]
- Notes on Chalcidites, and descriptions of various new species. *Annals and Magazine of Natural History*, (2) 5, 125–133. [1 February]
[Dated from Evenhuis (2003).]
- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 5, 269–281. [1 April]
[Dated from Evenhuis (2003).]
- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 5, 388–395. [1 May]
[Dated from Evenhuis (2003).]
- Characters of undescribed Diptera in the British Museum [part]. *The Zoologist*, 8(Appendix), lxxv–lxxii.
[29 May]
- Descriptions of Aphides [part]. *Annals and Magazine of Natural History*, (2) 6, 41–48. [1 July]
[Dated from Evenhuis (2003).]
- Descriptions of Aphides [concl.]. *Annals and Magazine of Natural History*, (2) 6, 118–122. [1 August]
[Dated from Evenhuis (2003).]
- Characters of undescribed Diptera in the British Museum [part]. *The Zoologist*, 8(Appendix), xciv–xcix.
[29 August]
- Diptera. Part I. *In: Insecta Saundersiana: or characters of undescribed insects in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c.* Vol. 1. Van Voorst, London. Pp. 1–76.
[before 7 October]
[Dated from Evenhuis (1997: 800).]
- List of homopterous insects in the collection of the British Museum*. Part I. British Museum, London.
260 pp. [9 November]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Descriptions of new British Aphides [concl.]. *The Zoologist*, 8(Appendix), cii–civ. [2 December]
- Characters of undescribed Diptera in the British Museum [concl.]. *The Zoologist*, 8(Appendix),
cxxi–cxxii. [2 December]

1851

- List of spiders captured by F. Walker, Esq. *Annals and Magazine of Natural History*, (2) 7, 157–158. [1 February]
[Dated from Evenhuis (2003).]
- [Papers read: Descriptions of six new British Diptera.] *Proceedings of the Entomological Society of London*, (2) 1, 48. [21 February]
[Although read at the meeting of the Society, this paper was never published. Dated from Wheeler (1912).]
- Notes on Chalcidites, and descriptions of various new species. *Annals and Magazine of Natural History*, (2) 7, 210–216. [1 March]
[Dated from Evenhuis (2003).]
- Diptera. (Part II). *In: Insecta Saundersiana: or characters of undescribed insects the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c.* Vol. 1. Van Voorst, London. Pp. 77–156.
[before 2 June]
[Dated from Evenhuis (1997: 800).]

List of homopterous insects in the collection of the British Museum. Part II. British Museum, London. Pp. 261–636. [14 June]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of homopterous insects in the collection of the British Museum. Part III. British Museum, London. Pp. 637–907. [22 November]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Insecta Britannica, Diptera. Volume 1. Reeve & Benham, London. vi + 314 pp. [31 December+]

[All presentations of this work to societies and deposits in libraries found during research conducted here have been in early 1852; the earliest yet found is the presentation to the Entomological Society of London at the 2 February 1852 meeting without no presentation of copies made at their January meeting, at which the President, J.O. Westwood alludes to in his annual presidential address. An advertisement from the publisher in the December issue of the *Quarterly Advertiser* says the first volume of the *Insecta Britannica* series (= Diptera) would appear on 1 December, yet the preface is dated December 1851 and no copies have been found announced as actually published in 1851. However, as there is no conclusive evidence from the author or publisher to contravene a 1851 date, I keep the date as 1851.]

1852

Notes on Chalcidites, and descriptions of various new species. *Annals and Magazine of Natural History*, (2) 9, 39–43. [1 January]

[Dated from Evenhuis (2003).]

List of homopterous insects in the collection of the British Museum. Part IV. British Museum, London. Pp. 908–1188. [24 April]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Notes on Chalcidites, and descriptions of various new species. *Annals and Magazine of Natural History*, (2) 10, 45–48. [1 July]

[Dated from Evenhuis (2003).]

Diptera (Part III). In: *Insecta Saundersiana: or characters of undescribed insects in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c.* Vol. 1. Van Voorst, London. Pp. 157–252. [before 2 August]

[Dated from Evenhuis (1997: 800).]

Catalogue of specimens of neuropterous insects in the collection of the British Museum. Part I.—(Phryganides—Perlides). British Museum, London. 192 pp. [9 October]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Notes on the distribution of insects in geographical regions. *The Zoologist*, 10, 3713–3715. [1 December]

1853

Diptera. Part IV. In: *Insecta Saundersiana: or characters of undescribed insects in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c.* Vol. 1. Van Voorst, London. Pp. 253–414. [before 7 March]

[Dated from Evenhuis (1997: 800).]

Catalogue of specimens of neuropterous insects in the collection of the British Museum. Part II. Sialides-Nemopterides. British Museum, London. Pp. 193–476. [9 April]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Catalogue of specimens of neuropterous insects in the collection of the British Museum. Part III. Termitidae-Ephemeridae. British Museum, London. Pp. 477–585. [14 May]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Insecta Britannica, Diptera. Volume 2. Lovell Reeve, London. vi + 297 + [1] pp., pls. 11–20
[December]

[Preface dated December 1853; recorded in the December preface of Gray, 1853, *Nomenclature of Diptera*.]

1854

Catalogue of specimens of neuropterous insects in the collection of the British Museum. Part IV. Odonata. “1853”. British Museum, London. Pp. 586–658. [14 January]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part I.—Lepidoptera Heterocera. British Museum, London. [ii] + 278 pp. [11 February]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part II.—Lepidoptera Heterocera. British Museum, London. Pp. 279–582. [13 May]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of specimens of dipterous insects in the collection of the British Museum. Part V. Supplement I. British Museum, London. Pp. 1–330. [14 October]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1855

List of specimens of dipterous insects in the collection of the British Museum. Part VI. Supplement II. “1854”. British Museum, London. Pp. 331–506. [13 January]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of specimens of dipterous insects in the collection of the British Museum. Part VII. Supplement III. British Museum, London. Pp. 507–774. [14 April]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part III.—Lepidoptera Heterocera. British Museum, London. Pp. 583–775. [9 June]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part IV.—Lepidoptera Heterocera. British Museum, London. Pp. 777–976. [11 August]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part V.—Lepidoptera Heterocera. British Museum, London. Pp. 977–1257. [10 November]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part VI.—Lepidoptera Heterocera. British Museum, London. Pp. 1259–1507. [8 December]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

List of spiders found at Piercefield, near Chepstow. *The Zoologist*, 13, 4561. [31 December+]

1856

Diptera. Part V. In: *Insecta Saundersiana: or characters of undescribed insects in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c.* Vol. 1. Van Voorst, London. Pp. 415–474. [3 March]

[Date presented by Saunders to the Entomological Society of London.]

- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part VII.—Lepidoptera Heterocera. British Museum, London. Pp. 1509–1808. [10 May]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Catalogue of the dipterous insects collected in Singapore and Malacca by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 1, 4–39. [1 March]
[Dated from Kappel (1896).]
- Insecta Britannica, Diptera.* Volume 3. Lovell Reeve, London. xxiv + 352 pp. [12 April]
[Date recorded as “just published” by the *Entomologist’s Weekly Intelligencer.*]
- Catalogue of the homopterous insects collected in Singapore and Malacca by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 1, 82–100. [1 June]
[Dated from Kappel (1896).]
- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part VIII.—Sphingidae. British Museum, London. 271 pp. [9 August]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- [Exhibitions: Exhibit of a necrophorous *Vespilio* and a cockchafer.] *Proceedings of the Entomological Society of London*, (2) 4, 4. [11 October]
[Dated from Wheeler (1912).]
- Catalogue of the dipterous insects collected in Sarawak, Borneo, by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 1, 105–136. [1 November]
[Dated from Kappel (1896).]
- Catalogue of the homopterous insects collected in Sarawak, Borneo, by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 1, 141–175. [1 November]
[Dated from Kappel (1896).]
- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part IX.—Noctuidae. British Museum, London. 253 pp. [22 November]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1857

- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part X.—Noctuidae. “1856”. British Museum, London. Pp. 254–491. [14 February]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- [Note on *Aphodius rufipes* flying to light.] *Proceedings of the Entomological Society of London*, (2) 4, 27. [21 February]
[Dated from Wheeler (1912).]
- [Description of *Lebeda cuneilinea*]. In: Saunders, W.W., On the transformations of Natal Lepidoptera. *Transactions of the Entomological Society of London*, (2) 4, 58–59. [21 February]
[Dated from Wheeler (1912).]
- On unity of system [part]. *The Naturalist*, 72, 27–29. [February]
- On unity of system [part]. *The Naturalist*, 73, 57–60. [March]
- Catalogue of homopterous insects collected at Sarawak, Borneo by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 3, 196–198. [11 April]
[Dated from Kappel (1896).]
- On unity of system [part]. *The Naturalist*, 74, 72–74. [April]

- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part XI.—Noctuidae. “1856”. British Museum, London. Pp. 493–764. [9 May]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- On unity of system [part]. *The Naturalist*, 76, 132–134. [June]
- On unity of system [part]. *The Naturalist*, 77, 148–150. [July]
- Characters of undescribed insects in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c. [part]. *Transactions of the Entomological Society of London* (2), 4, 119–158. [20 August]
 [Dated from Wheeler (1912).]
- On unity of system [part]. *The Naturalist*, 79, 198–200. [September]
- On unity of system [part]. *The Naturalist*, 80, 223–225. [October]
- On unity of system [part]. *The Naturalist*, 82, 264–267. [December]

1858

- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part XII.—Noctuidae. “1857”. British Museum, London. Pp. 765–982. [9 January]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part XIII.—Noctuidae. “1857”. British Museum, London. Pp. 983–1236. [9 January]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Characters of undescribed insects in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c. [part]. *Transactions of the Entomological Society of London* (2), 4, 190–235. [25 January]
 [Dated from Wheeler (1912).]
- Notes on *Aphis quercus*. *Proceedings of the Entomological Society of London*, (2), 4, 95. [25 January]
 [Dated from Wheeler (1912).]
- Early season. *Entomologist's Weekly Intelligencer*, 5, 197. [19 March]
- Acrocera albipes*, Meigen. *Entomologist's Weekly Intelligencer*, 5, 197. [19 March]
- Notes on *Aphis quercus*. *The Zoologist*, 16, 5945–5946. [March]
- On unity of system [part]. *The Naturalist*, 86, 75–77. [April]
- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part XIV.—Noctuidae. British Museum, London. Pp. 1237–1519. [22 May]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- On unity of system [part]. *The Naturalist*, 87, 104–106. [May]
- Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 2, 202–209. [1 September]
 [Dated from Evenhuis (2003).]
- Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 2, 280–286. [1 October]
 [Dated from Evenhuis (2003).]
- List of the specimens of lepidopterous insects in the collection of the British Museum.* Part XV.—Noctuidae. British Museum, London. Pp. 1521–1888. [9 October]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Catalogue of the dipterous insects collected in the Aru Islands by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 3, 77–110. [1 November]
 [Dated from Kappel (1896).]
- List of homopterous insects in the collection of the British Museum.* Supplement. British Museum, London. 369 pp. [17 April]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Notes of *Aphis quercus*. *Journal and Proceedings of the Linnean Society of London, Zoology*, 3, 95. [1 November]

[Dated from Kappel (1896).]

Homoptera. In: *Insecta Saundersiana: or characters of undescribed insects in the collections of William Wilson Saunders, Esq., F.R.S., F.L.S., etc.* J. Van Voorst, London. [i] + 117 pp. [December]

1859

Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 3, 50–56. [1 January]

[Dated from Evenhuis (2003).]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XVI.—Deltoides. “1858.” British Museum, London. 253 pp. [22 January]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

On unity of system [part]. *The Naturalist*, 95, 295–297. [January]

Catalogue of the dipterous insects collected in the Aru Islands by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 3, 111–131. [1 February]

[Dated from Kappel (1896).]

Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 3, 258–265. [1 April]

[Dated from Evenhuis (2003).]

Catalogue of heterocerous lepidopterous insects collected at Singapore by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 3, 183–196. [11 April]

[Dated from Kappel (1896).]

Catalogue of heterocerous lepidopterous insects collected at Malacca by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 3, 196–198. [11 April]

[Dated from Kappel (1896).]

Notes and queries respecting Aphides. *Entomologist's Weekly Intelligencer*, 6, 21–22. [16 April]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XVII.—Pyrilides. British Museum, London. Pp. 255–508. [14 May]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 4, 217–224. [1 September]

[Dated from Evenhuis (2003).]

Leistus montanus. *Entomologist's Weekly Intelligencer*, 6, 190. [10 September]

Catalogue of the dipterous insects collected at Makassar in Celebes, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 4, 90–96. [19 September]

[Dated from Kappel (1896).]

[Notes on a horn-shaped gall of the lime leaf]. *Proceedings of the Entomological Society of London*, (2) 5, 48. [3 October]

[Dated from Wheeler (1912).]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XVIII.—Pyrilides. British Museum, London. Pp. 509–798. [8 October]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

- Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History*, (3) 4, 370–376. [1 November]
[Dated from Evenhuis (2003).]
- Catalogue of the dipterous insects collected at Makassar in Celebes, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 4, 90–144. [8 December]
[Dated from Kappel (1896).]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XIX.—Pyrilides. British Museum, London. Pp. 799–1036. [22 December]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1860

- Characters of undescribed Neuroptera in the collection of W.W. Saunders, Esq., F.R.S., &c [part]. *Transactions of the Entomological Society of London*, (2) 5, 176. [4 January]
[Dated from Wheeler (1912); text concludes, pp. 177–199 (7 May).]
[Notes on the synonymy of *Aphis pisi*], pp. 493–494. In: Curtis, J., *Farm insects: being the natural history and economy of the insects injurious to the field crops of great Britain and Ireland, and also those which infest barns and granaries. With suggestions for their destruction*. Blackie and Son, Glasgow, Edinburgh, London. xiv + 528 pp. [14 January]
[Date of notice in *The Athenaeum*.]
- Catalogue of the dipterous insects collected at Makassar in Celebes, by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 4, 145–172. [10 February]
[Dated from Kappel (1896).]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XX.—Geometrites. British Museum, London. Pp. 1–276. [10 March]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 5, 304–311. [1 April]
[Dated from Evenhuis (2003).]
- Characters of undescribed species of the genus *Leucospis*. *Journal of Entomology*, 1, 16–23. [April]
On unity of system [concl.]. *Magazine of Natural History and Naturalist*, 4, 75–78. [April]
- Characters of undescribed Neuroptera in the collection of W.W. Saunders, Esq., F.R.S., &c [concl.]. *Transactions of the Entomological Society of London*, (2) 5, 177–199. [7 May]
[Dated from Wheeler (1912); the first page of this article was published in the 4 January issue of *Transactions*.]
- Catalogue of the dipterous insects collected in Amboyna by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 5, 144–168. [18 July]
[Dated from Kappel (1896).]
- [Descriptions of new taxa.] In: D'Urban, W.S.M., A systematic list of Lepidoptera collected in the vicinity of Montreal. *The Canadian Naturalist and Geologist*, 5(4), 241–266. [August]
- List of British Euplexoptera, Orthoptera, Thysanoptera & Hemiptera*. E. Newman, London. 55 pp. [before 22 September]
[Dated from *Entomologist's Weekly Intelligencer*, 8, 199.]
- British Hemiptera. *Entomologist's Weekly Intelligencer*, 8, 199–200. [22 September]
[Exhibition: *Lasiommata megaera*.] *The Zoologist*, 18, 7162. [1 October]
[Date of deposit at the Stationer's Company.]
- The new List of British Hemiptera. *Entomologist's Weekly Intelligencer*, 8, 23. [20 October]

- Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) 6, 357–360. [1 November]
[Dated from Evenhuis (2003).]
- Characters of undescribed Diptera in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c. [part]. *Transactions of the Entomological Society of London* (2), 5, 268–296. [3 November]
[Dated from Wheeler (1912); text (pp. 297–334) concludes in 1861.]
- Erratum in the List of Hemiptera, just published. *Entomologist's Weekly Intelligencer*, 9, 40. [3 November]
- List of the specimens of lepidopterous insects in the collection of the British Museum. Part XXI.—Geometrites. (continued).* British Museum, London. Pp. 277–498. [10 November]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1861

- Characters of undescribed Diptera in the collection of William Wilson Saunders, Esq., F.R.S., F.L.S., &c. [concl.]. *Transactions of the Entomological Society of London*, (2) 5, 297–334. [25 February]
[Dated from Wheeler (1912).]
- [Note on galls exhibited by Mr. Saunders.] *Proceedings of the Entomological Society of London*, (2) 5, 116. [25 February]
[Dated from Wheeler (1912).]
- [Notes a variety of *Lasiommata megaera*.] *Proceedings of the Entomological Society of London*, (2) 5, 124. [25 February]
[Dated from Wheeler (1912).]
- Characters of undescribed species of the family Chalcidae. *Journal of Entomology*, 1, 172–185. [February]
- [Descriptions of new taxa.] In: D'Urban, W.S.M., Addenda to the natural history of the Valley of the River Rouge. *Canadian Naturalist and Geologist*, 6, 36–42. [February]
- Catalogue of the dipterous insects collected at Dorey, New Guinea, by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 5, 229–254. [27 March]
[Dated from Kappel (1896).]
- Catalogue of the dipterous insects collected at Manado in Celebes and in Tond, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 5, 258–264. [27 March]
[Dated from Kappel (1896).]
- Catalogue of the dipterous insects collected at Manado in Celebes and in Tond, by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 5, 265–270. [24 May]
[Dated from Kappel (1896).]
- List of the specimens of lepidopterous insects in the collection of the British Museum. Part XXII.—Geometrites. (continued).* British Museum, London. Pp. 499–755. [18 May]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Catalogue of the dipterous insects collected at Batchian, Kaisaa and Makian and at Tidon in Celebes, by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 5, 270–303. [24 May]
[Dated from Kappel (1896).]

List of Ceylon insects, pp. 442–463. In: Tennent, J.E., *Sketches of the natural history of Ceylon with narratives and anecdotes illustrative of the habits and instincts of the Mammalia, birds, reptiles, fishes, insects, &c. including a monograph of the elephant and a description of the modes of camping and training it. With engravings from original drawings.* Longman, Green, Longman and Roberts, London. xxiii + 500 pp. [26 October]

[Dated from *The Bookseller*.]

Catalogue of the dipterous insects collected at Gilolo, Ternate and Ceram, by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 6, 4–23. [1 November]

[Dated from Kappel (1896).]

A hail-stone fly. *Entomologist's Weekly Intelligencer*, 7, 76. [3 December]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XXIII.—Geometrites. (continued). British Museum, London. Pp. 757–1020. [14 December]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1862

Catalogue of heterocerous lepidopterous insects collected at Sarawak, in Borneo, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 6, 82–96. [1 March]

[Dated from Kappel (1896).]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XXIV.—Geometrites. (continued). British Museum, London. Pp. 1021–1280. [8 March]

[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

[Note: on the similarity of North American and European Hemiptera.] *Proceedings of the Entomological Society of London*, (3) 1, 8–9. [7 April]

[Dated from Wheeler (1912).]

[Note: on the habits of some Diptera and their parasites, with descriptions.] *Proceedings of the Entomological Society of London*, (3) 1(1), 21. [7 April]

[Dated from Wheeler (1912).]

Characters of undescribed species of Homoptera in the collection of F.P. Pascoe. *Journal of Entomology*, 1, 303–319. [April]

Catalogue of heterocerous lepidopterous insects collected at Sarawak, in Borneo, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 6, 97–145. [15 May]

[Dated from Kappel (1896).]

[Proceedings of Societies: Entomological Society: Note on *Argynnis Cybele* and *A. Aphrodite*.] *The Zoologist*, 20, 8021–8022. [May]

[This recording of the minutes of the meeting of the Entomological Society of London appeared here before it was published by the society's *Proceedings*.]

Characters of undescribed Lepidoptera in the collection of W.W. Saunders, Esq. [part]. *Transactions of the Entomological Society of London*, (3) 1, 70–128. [29 May]

[Dated from Wheeler (1912).]

Characters of undescribed Lepidoptera in the collection of A. Fry, Esq. *Transactions of the Entomological Society of London*, (3) 1, 253–262. [11 August]

[Dated from Wheeler (1912).]

Characters of undescribed Lepidoptera in the collection of W.W. Saunders, Esq. [concl.]. *Transactions of the Entomological Society of London*, (3) 1, 263–279. [11 August]

[Dated from Wheeler (1912).]

- Description of a new genus and species of Noctuides. *Transactions of the Entomological Society of London*, (3) 1, 311–312. [11 August]
 [Dated from Wheeler (1912).]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXV.—Geometrites. (continued). British Museum, London. Pp. 1281–1477. [11 October]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Oak-leaved or sinuated-leaved variety of the common honeysuckle. *The Phytologist*, 6, 317. [October]
- Catalogue of heterocerous lepidopterous insects collected at Sarawak, in Borneo, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 6, 171–198. [1 November]
 [Dated from Kappel (1896).]
- Notes on Chalcidites, and characters of undescribed species. *Transactions of the Entomological Society of London*, (3) 1, 345–397. [17 November]
- Note on *Argynnis Cybele* and *A. Aphrodite*. *Proceedings of the Entomological Society of London*, (3) 1, 74–75. [17 November]
 [Dated from Wheeler (1912).]
- [Note: On adding a list of Southgate plants to the metropolitan list.] *The Phytologist*, 6, 349.
 [November]
- On unity of system*. E. Newman, London. 96 pp. [before 21 November]
 [Date of letter indicating copy mailed by Walker to Prof. Frederick McCoy, Director of the National Museum of Victoria, Melbourne.]

1863

- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXVI.—Geometrites. (continued). “1862.” British Museum, London. Pp. 1479–1790. [14 February]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXVII. Crambicites & Torticitites. British Museum, London. Pp. 1–286. [18 April]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Catalogue of heterocerous lepidopterous insects collected at Sarawak, in Borneo, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 7, 49–84. [13 May]
 [Dated from Kappel (1896).]
- Postscript [to Parasites and hyperparasites, by E. Newman]. *Pteromalus boarmiae*, Walker. *Tetrastichus decisus*, Walker. *The Zoologist*, 21, 8609–8610. [28 June]
- Catalogue of heterocerous lepidopterous insects collected at Sarawak, in Borneo, by Mr. A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 7, 160–180. [29 October]
 [Dated from Kappel (1896).]
- On some insects collected in Madagascar by Mr. J. Caldwell. *Proceedings of the Zoological Society of London*, 1863, 165–168. [October]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXVIII. Torticitites & Tineites. British Museum, London. Pp. 287–561. [19 December]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1864

- [Papers read: Characters of undescribed Lepidoptera.] *Proceedings of the Entomological Society of London*, (3) 1[1863], 168. [25 January]
 [Dated from Wheeler (1912). Though read at the meeting, the paper was never published.]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXIX. Tineites. British Museum, London. Pp. 563–835. [19 March]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Catalogue of heterocerous lepidopterous insects collected at Sarawak, in Borneo, by Mr. A.R. Wallace, with descriptions of new species [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 7, 181–198. [5 April]
 [Dated from Kappel (1896).]
- Catalogue of the dipterous insects collected at Waigiou, Mysol and North Ceram, by Mr. A.R. Wallace, with descriptions of new species. *Journal and Proceedings of the Linnean Society of London, Zoology*, 7, 202–238. [5 April]
 [Dated from Kappel (1896).]
- Notes on the distribution of insects in the Channel Islands. *The Zoologist*, 22, 9273–9276. [28 November]
- Characters of undescribed species of *Smiera* (Chalcidites). *Transactions of the Entomological Society of London*, (3) 2, 181–207. [28 November]
 [Dated from Wheeler (1912).]
- On the late swarms of syrphi in the Isle of Wight. *Entomologist's Monthly Magazine*, 1, 139–140. [November]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXX. Tineites. British Museum, London. Pp. 838–1096. [10 December]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1865

- Notes on insects inhabiting the reed, and their parasites. *Entomologist's Monthly Magazine*, 1, 184–185. [January]
- Descriptions of new species of dipterous insects of New Guinea [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 8, 102–108. [13 January]
 [Dated from Kappel (1896).]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXXI. Supplement. “1864.” British Museum, London. Pp. 1–321. [10 December]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXXII. Supplement.—Part 2. British Museum, London. Pp. 323–706. [29 April]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Description of a *Pteromalus* new to Britain (*P. liparæ*). *Entomologist's Monthly Magazine*, 1, 255–256. [April]
- List of the specimens of lepidopterous insects in the collection of the British Museum*. Part XXXIII. Supplement.—Part 3. British Museum, London. Pp. 707–1120. [14 October]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Note on *Cynips lignicola*. *The Entomologist*, 2, 99. [14 October]
- The celery-fly. *The Entomologist*, 2, 318. [November]
- Egg parasite on *Pygaera bucephala*. *The Entomologist*, 2, 320–321. [November]
- Descriptions of new species of dipterous insects of New Guinea [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 8, 109–130. [5 December]
 [Dated from Kappel (1896).]

Descriptions of some new species of dipterous insects from the island of Salwatty, near New Guinea. *Journal and Proceedings of the Linnean Society of London, Zoology*, 8, 130–136. [5 December]
[Dated from Kappel (1896).]

1866

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XXXIV. Supplement.—Part 4. “1865.” British Museum, London. Pp. 1121–1533. [13 January]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Characters of a new genus and species of Chalcidites. *Transactions of the Entomological Society of London*, (3) 2, 441–442. [19 March]
[Dated from Wheeler (1912).]

Synopsis of the Diptera of the Eastern Archipelago discovered by Mr. Wallace and noticed in the ‘Journal of the Linnaean Society.’ *Journal and Proceedings of the Linnean Society of London, Zoology*, 9, 1–30. [30 April]
[Dated from Kappel (1896).]

[Descriptions of new taxa], pp. 309–344. In: J.K. Lord, *The naturalist in Vancouver Island and British Columbia*. In two volumes—Vol. II. R. Bentley, London. vii + 375 pp. [30 June]
[Date recorded in *The Bookseller*. The descriptions of new taxa of insects (by Frederick Smith and Francis Walker) are in the appendix (pp. 289–375) entitled “A list of mammals, birds, insects, reptiles, fishes, shells, annelides, and Diatomaceae, collected by myself in British Columbia and Vancouver Island, with notes on their habits.” Walker was responsible for the new species of Coleoptera, Diptera, and some Lepidoptera, and Hymenoptera.]

List of the specimens of lepidopterous insects in the collection of the British Museum. Part XXXV. Supplement.—Part 5. British Museum, London. Pp. 1535–2040. [4 August]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1867

Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum. Part I. Scutata. British Museum, London. 240 pp. [25 May]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Characters of some undescribed heterocerous Lepidoptera. *Journal and Proceedings of the Linnean Society of London, Zoology*, 9, 181–199. [14 September]
[Dated from Kappel (1896).]

Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum. Part II. Scutata. British Museum, London. Pp. 241–417 [23 November]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1868

Notes on Aphides. *The Zoologist* (2) 3, 1048–1053. [1 January]

Notes on Aphides. *The Zoologist* (2) 3, 1118–1123. [1 March]

Catalogue of the specimens of Blattariae in the collection of the British Museum. British Museum, London. 239 pp. [13 June]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Notes on Aphides. *The Zoologist* (2) 3, 1296–1301. [1 July]

Notes on Aphides. *The Zoologist* (2) 3, 1328–1333. [1 August]

Catalogue of the homopterous insects collected in the Indian Archipelago by A.R. Wallace, with descriptions of new species [part]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 10, 82–193. [7 August]
[Dated from Kappel (1896).]

Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum. Part III. British Museum, London. Pp. 419–599. [12 December]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1869

Catalogue of the homopterous insects collected in the Indian Archipelago by A.R. Wallace, with descriptions of new species [concl.]. *Journal and Proceedings of the Linnean Society of London, Zoology*, 10, 276–330. [8 January]
[Dated from Kappel (1896).]

Catalogue of the specimens of Dermaptera Saltatoria and supplement to the Blattariae in the collection of the British Museum. British Museum, London. 224 pp. [29 May]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

[Descriptions of new species], pp. 325–378. In: Chapman, T., On some lepidopterous insects from Congo. *Transactions of the Natural History Society of Glasgow*, 1(7), 328–378. [May]

Notes on Chalcididae; and description of a new species of *Megastigmus*. *Transactions of the Entomological Society of London* (3) 3, 313–314. [29 September]
[Dated from Wheeler (1912).]

Note on earwigs. *The Entomologist*, 4, 356. [November]

Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum. Part II. British Museum, London. Pp. 225–423. [11 December]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

Characters of undescribed Lepidoptera Heterocera. E.W. Janson, London. 112 pp. [November]
[Date advertised for sale in *The Entomologist*.]

Characters of seventy-six undescribed species of heterocerous Lepidoptera, from Congo, West Africa. Society of Natural History, Glasgow. 54 pp., 3 pls. [31 December+]
[Date of preface. Reprinted from the article by Chapman, T. 1869, in the *Transactions of the Natural History Society of Glasgow*, 1(7), 325–378.]

1870

Notes on Aphides. *The Zoologist* (2)5, 1996–2001. [1 February]

Chlorops imbedded in a hailstone. *Proceedings of the Entomological Society of London*, 1869(6), xxvi. [7 February]
[Dated from Wheeler (1912).]

Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum. Part III. British Museum, London. Pp. 425–603. [26 March]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

A list of the butterflies collected by J.K. Lord, Esq., in Egypt, along the African shore of the Red Sea, and in Arabia; with descriptions of the species new to science [part]. *The Entomologist*, 5, 48–57. [April]

A list of the butterflies collected by J.K. Lord, Esq., in Egypt, along the African shore of the Red Sea, and in Arabia; with descriptions of the species new to science [part]. *The Entomologist*, 5, 123–134. [August]

- A list of the butterflies collected by J.K. Lord, Esq., in Egypt, along the African shore of the Red Sea, and in Arabia; with descriptions of the species new to science [concl.]. *The Entomologist*, 5, 151–155. [28 August]
- List of the Dermaptera discovered by J.K. Lord, Esq., in Egypt, and in the adjoining regions; with descriptions of the new species. *The Zoologist*, (2) 5, 2296–2303. [1 September]
- Extracts from notes on locusts. *The Entomologist*, 5, 156–158. [September]
- A list of the Hemiptera collected by J.K. Lord, Esq., in Egypt, along the African shore of the Red Sea and in Arabia; with descriptions of the species new to science [part]. *The Zoologist*, (2) 5, 2339–2341. [1 October]
- Correction of an error: *Pachytylus cinerascens* a British insect. *The Entomologist*, 5, 185. [October]
- A list of the Hemiptera collected by J.K. Lord, Esq., in Egypt, along the African shore of the Red Sea and in Arabia; with descriptions of the species new to science [concl.]. *The Zoologist*, (2) 5, 2378–2381. [27 November]
- Cynips lignicola* in Ireland. *The Entomologist*, 5, 197. [November]
- Flight of Aphides. *The Entomologist*, 5, 204–205. [November]
- A list of the insects collected by J.K. Lord, Esq., in Egypt, along the African shore of the Red Sea and in Arabia; with descriptions of the species new to science. *The Zoologist*, (2) 5, 2403–2405. [December]
- Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum*. Part IV. British Museum, London. Pp. 605–809. [10 December]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]

1871

- Notes on the Chalcididae. Part I.- *Isosoma*. *The Zoologist*, (2) 6, 2429–2437. [1 January]
- [Note on the habits of the English species of *Ephydra* and its allies]. *American Journal of Science*, (3) 1, 110. [February]
- List of Diptera collected in Egypt and Arabia, by J.K. Lord, Esq., with descriptions of the species new to science [part]. *The Entomologist*, 5, 255–263. [March]
- Notes on Chalcididae*. Part I. - Eurytomidae. E.W. Janson, London. Pp. 1–17. [March]
[Date recorded in the *Science Gossip*.]
- List of Diptera collected in Egypt and Arabia, by J.K. Lord, Esq., with descriptions of the species new to science [part]. *The Entomologist*, 5, 271–275. [April]
- Notes on Chalcididae*. Part II.—Eurytomidae and Torymidae. E.W. Janson, London. Pp. 19–36. [May]
[Date recorded in the *Science Gossip*.]
- Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum*. Part V. “1870.” British Museum, London. 811–850 + 43 + 116 pp. [26 June]
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Descriptions of some new insects collected by Dr. Anderson during the Expedition to Yunan. *Proceedings of the Zoological Society of London*, 1871, 244–249. [June]
[Full authorship of this article is Moore, F., Walker, F. & Smith, F. Walker was responsible for the Orthoptera.]
- List of Coleoptera collected by J.K. Lord, Esq. in Egypt, Arabia and the near African shore of the Red Sea. With characters of the undescribed species*. E.W. Janson, London. 19 pp. [3 June–1 July]
[Listed at the 1 July meeting as donated to the Entomological Society of Belgium since the last meeting (3 June).]
- A list of Hymenoptera collected by J.K. Lord, Esq., in Egypt, in the neighbourhood of the Red Sea, and in Arabia; with descriptions of the new species*. E.W. Janson, London. iv + 59 pp. [before 1 July]

- [Listed at the 1 July meeting as donated to the Entomological Society of Belgium since the last meeting (3 June).]
- List of Diptera collected in Egypt and Arabia, by J.K. Lord, Esq., with descriptions of the species new to science [concl.]. *The Entomologist*, 5, 339–346. [July]
- Notes on some insects of Nova Scotia and Canada. *Canadian Entomologist*, 3, 141–144. [October]
- Notes on Chalcidiae*. Part III.—Torymidae and Chalcididae. E.W. Janson, London. Pp. 37–54. [before 20 November
[Date recorded in the *Bulletin of the Essex Institute*.]
- Notes on Chalcidiae*. Part IV. Chalcididae, Leucospidae, Agaonidae, Eucharidae, Perilampidae, Ormyridae, Encyrtidae. E.W. Janson, London. Pp. 55–70. [before 20 November
[Date recorded in the *Bulletin of the Essex Institute*.]
- Nova Scotian Hymenoptera. *Canadian Entomologist*, 3, 197. [November]
- Notes on oak-apples. *The Entomologist*, 5, 431–433. [November]
- Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum*. Part IV. British Museum, London. 211 pp. [9 December
[Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Galls and gall-makers. *The Entomologist*, 5, 450–451. [December]

1872

- Notes in the insects of the Scilly Isles. *The Entomologist*, 6, 3–5. [January]
- Lygaeus punctato-guttatus*. *The Entomologist*, 6, 7. [January]
- Economy of Eurytomidae. *The Entomologist*, 6, 17–18. [January]
- Notes on aphides. *The Entomologist*, 6, 25–27. [January]
- Hemiptera, Heteroptera and Dermaptera (Orthoptera) of America to the north of the United States. *Canadian Entomologist*, 4, 29–31. [15 February]
- [Papers read: Notes on the Eurytominae.] *Proceedings of the Entomological Society of London*, 1871, xlviii. [19 February
[Dated from Wheeler (1912). Although read at the meeting of the Society, this paper was never published.]
- Economy of Torymidae. *The Entomologist*, 6, 41–43. [March]
- Insects of the Scilly Isles [part]. *The Entomologist*, 6, 52–53. [March]
- Economy of Chalcidiae. *The Entomologist*, 6, 65–70. [April]
- Insects of the Scilly Isles [concl.]. *The Entomologist*, 6, 78–79. [April]
- Notes on Chalcidiae*. Part V. Encyrtidae, Myinidae, Eupelmidae, Cleonymidae, Spalangidae and Pirenidae. E.W. Janson, London. Pp. 71–88, 16 figures. [before May
[Dated presented to the Berlin Entomological Society.]
- Notes on Chalcidiae*. Part VI. Hormoceridae, Sphegigasteridae, Pteromalidae, Elasmidae, Elachistidae, Eulophidae, Entedonidae, Tetrastichidae, Trichogrammididae. E.W. Janson, London. Pp. 89–105, 18 figures. [before May
[Dated presented to the Berlin Entomological Society.]
- Economy of Chalcidiae. *The Entomologist*, 6, 89–94. [May]
- Note on *Cynips lignicola*. *The Entomologist*, 6, 101. [May]
- Early occurrence of *Ophion obscurus*. *The Entomologist*, 6, 107. [June]
- American Aphides and Cocci. *The Entomologist*, 6, 107–108. [June]
- Economy of Chalcidiae. *The Entomologist*, 6, 113–114. [June]
- Economy of Chalcidiae. *The Entomologist*, 6, 131–132. [July]
- [Description of new genus and species.] *In*: Richter, H.C., A new form of parasite. *Science Gossip*, 1872, 131–132. [July]

- Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum.* Part V. British Museum, London. 202 pp. [12 October]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- On the geographical distribution of some genera of Canadian insects [part]. *Canadian Entomologist*, 4, 184–187. [15 October]
- Economy of Chalcididae. *The Entomologist*, 6, 201–202. [October]
- Notes on some genera of Canadian insects. *Canadian Entomologist*, 4, 209–210. [15 November]
- Mosquitoes. *The Entomologist*, 6, 223. [November]
- Economy of Chalcididae. *The Entomologist*, 6, 225–227. [November]
- Note on some insects of Italy and of South France, observed between the middle of May and the middle of July, 1872 [part]. *The Entomologist*, 6, 227–230. [November]
- Notes on some genera of Canadian insects. *Canadian Entomologist*, 4, 236–237. [15 December]
- Note on *Phylloxera Quercus*. *The Entomologist*, 6, 242–243. [December]
- Economy of Chalcididae. *The Entomologist*, 6, 249–251. [December]
- On some Amurland insects. Part II. *The Entomologist*, 6, 255–257. [December]
- Notes on Chalcididae.* Part VII. E.W. Janson, London. Pp. 109–129, 17 figs. [31 December+]

1873

- Economy of Chalcididae. *The Entomologist* 6, 273–274. [January]
- Notes on some insects of Italy and of South France, observed between the middle of May and the middle of July, 1872 [part]. *The Entomologist* 6, 278–281. [January]
- On the geographical distribution of some genera of Canadian insects [part]. *Canadian Entomologist*, 5, 16–18. [January]
- Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum.* Part VI. British Museum, London. 210 pp. [22 February]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- Economy of Chalcididae. *The Entomologist* 6, 298–300. [February]
- Notes on some insects of Italy and south France, observed between the middle of May and the middle of July, 1872 [concl.]. *The Entomologist* 6, 303–308. [February]
- Economy of Chalcididae. *The Entomologist* 6, 322–324. [March]
- Central African blood-sucking flies. *The Entomologist*, 6, 327–328. [March]
- On some Amurland insects (Part III). *The Entomologist*, 6, 328–329. [March]
- On the geographical distribution of some genera of Canadian insects [part]. *Canadian Entomologist*, 5, 43–44. [March]
- Economy of Chalcididae. *The Entomologist*, 6, 346–349. [April]
- On some Amurland insects (Part IV). *The Entomologist*, 6, 359. [April]
- Economy of Chalcididae. *The Entomologist*, 6, 369–371. [April]
- On the geographical distribution of some genera of Canadian insects [concl.]. *Canadian Entomologist*, 5, 77–78. [April]
- Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum.* Part VII. British Museum, London. 213 pp. [10 May]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
- On Turkestan Diptera. *The Entomologist*, 6, 388. [May]
- Economy of Chalcididae, and characters of a few undescribed species. *The Entomologist*, 6, 394–399. [June]
- Economy of Chalcididae. *The Entomologist*, 6, 418–419. [July]
- Ichneumonidae of the Isle of Man. *The Entomologist*, 6, 431–432. [July]
- Economy of Chalcididae. *The Entomologist*, 6, 442–445. [August]

- The waxy exudation of Homoptera. *The Entomologist*, 6, 456. [August]
 Economy of Chalcididae. *The Entomologist*, 6, 471–474. [September]
Catalogue of the specimens of heteropterous-Hemiptera in the collection of the British Museum. Part VIII. British Museum, London. 220 pp. [11 October]
 [Dated from Sherborn, 1934, *Ann. Mag. Nat. Hist.* (10) 13, 308–312.]
 Notes on the Mymaridae. *The Entomologist*, 6, 498–502. [October]
 On Aphides and honeydew. *The Entomologist*, 6, 502–503. [October]
 Aspect on the under side of the oak-leaf, July 22nd. *Entomologist*, 6, 503–505. [October]
 Note on the appearance of *Aphis* Nymphaeae and of its Aphidius in the middle of August. *The Entomologist*, 6, 505–506. [October]
 On parasitism of Chalcididae. *The Entomologist* 6, 506. [October]
 Notes on the Oxyura.—Family 1. Platygasteridae. *The Entomologist*, 6, 535–542. [November]

1874

- The families of Diptera. *Canadian Entomologist*, 6, 11–12. [15 January]
 [Annotations to species, pp. 3–4.] *In*: Weise, A., Descriptions of oak-galls. Translated from Dr. G.L. Mayr's 'Die Mitteleuropäischen Eichengallen [part]. *The Entomologist*, 7, 1–4. [January]
 Notes on the Oxyura.—Family 2. Scelionidae. *The Entomologist*, 7, 4–10. [January]
 Three notes on Aphides. *The Entomologist*, 7, 12–13. [January]
 Notes on the Oxyura.—Family 3. Ceraphronidae. 4. Diapridae. 5. Belytidae. 6. Proctotrupidae. 7. Heloridae. 8. Embolemidae. 9. Bethylidae. 10. Dryinidae. *The Entomologist*, 7, 25–35. [February]
 Notes on the wing-bones of the two-winged flies. *The Entomologist*, 7, 36–42. [February]
 Lime-galls. *The Entomologist*, 7, 46. [February]
 [Annotations to species, pp. 51–56.] *In*: Weise, A., Descriptions of oak-galls. Translated from Dr. G.L. Mayr's 'Die Mitteleuropäischen Eichengallen. *The Entomologist*, 7, 50–56. [March]
 Note on *Megastigmus*. *The Entomologist*, 7, 71. [March]
 [Annotations to species, pp. 74–75.] *In*: Herkomer, A., Descriptions of oak-galls. Translated from Dr. G.L. Mayr's 'Die Mitteleuropäischen Eichengallen [part]. *The Entomologist*, 7, 73–75. [April]
 Geographical distribution of continental Rhopalocera. *The Entomologist*, 7, 75–79. [April]
Translation of synoptical arrangements of some European families and genera of Hymenoptera. E.W. Janson, London. 68 pp. [31 December+]
 On oak-leaf insects. *The Entomologist*, 7, 92. [April]
 Goureau's observations on parasitism. *The Entomologist*, 7, 93. [April]
 Rose-galls. *The Entomologist*, 7, 94. [April]
 [Annotations to species, pp. 98–99.] *In*: Herkomer, A., Descriptions of oak-galls. Translated from Dr. G.L. Mayr's 'Die Mitteleuropäischen Eichengallen [part]. *The Entomologist*, 7, 97–99. [May]
 Notes on the wing-bones of the two-winged flies. *The Entomologist*, 7, 100–102. [May]
 Notes on some Amurland European Diptera. *The Entomologist*, 7, 103–104. [May]
 Rose-galls. *The Entomologist*, 7, 113. [May]
 Translation of the synopsis of the genera of European Mycetophilidae. *Canadian Entomologist*, 6, 111–114. [15 June]
 [Descriptions of new taxa], pp. 399–402. *In*: Smith, F., Descriptions of new species of Tenthredinidae, Ichneumonidae, Chrysididae, Formicidae, &c. of Japan. *Transactions of the Entomological Society of London*, 1874, 373–409. [June]
 [Dated from Wheeler (1912).]
 Notes on the wing-bones of the two-winged flies [part]. *The Entomologist*, 7, 126–128. [June]
 Notes on the wing-bones of the two-winged flies [part]. *The Entomologist*, 7, 147–149. [July]

- A note on Aphides. *The Entomologist*, 7, 166–167. [July]
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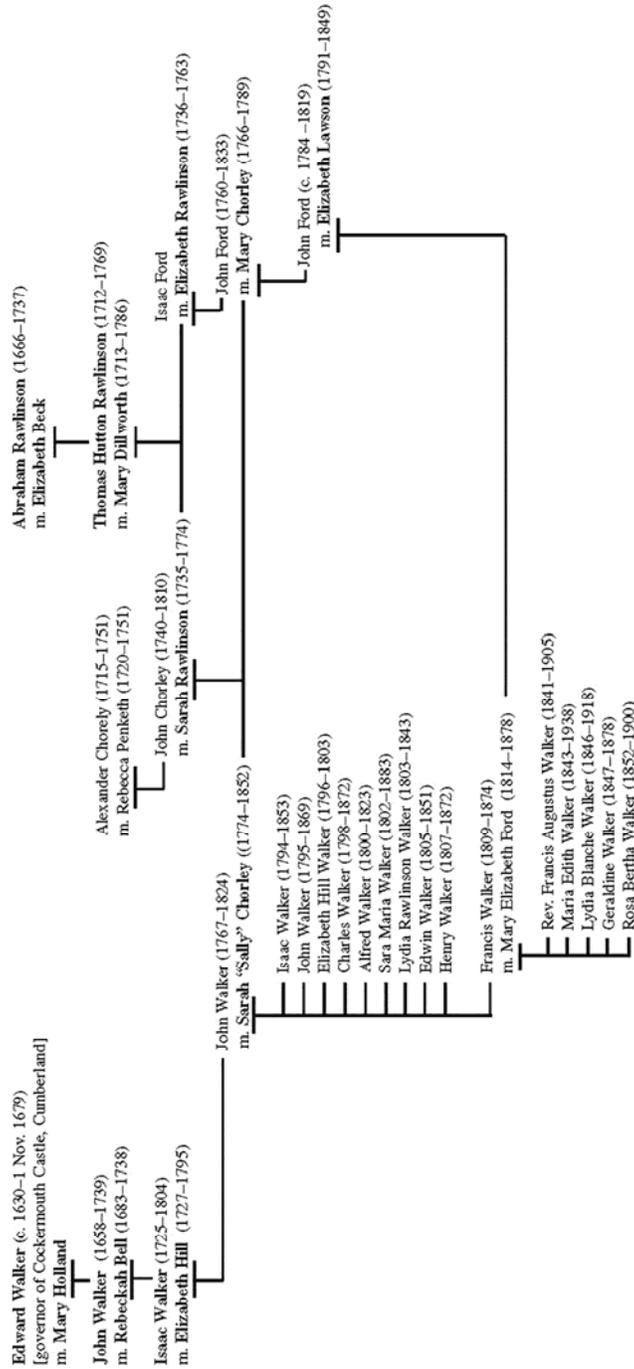
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Appendix II. Genealogy of the Walker-Ford Families

GENEALOGY OF THE WALKER-FORD FAMILIES



boldface = member of the Society of Friends

SUBMISSION FORM DIRECTORY OF NORTH AMERICAN DIPTERISTS

For those who have not yet sent in a synopsis of their interests for the *Directory of North America Dipterists*, the following form is provided. Please restrict yourselves to no more than 20 words when listing the titles of your major projects and the animals you work with. Should any of you like to expand or modify your entries from the last list, use the form to indicate the changes.

The information can be emailed, or the form completed and faxed or mailed to the following address:

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Projects and taxa studied: _____
