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Part I

A HISTORY OF ODONATOLOGY IN THE BRITISH ISLES*

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The development of odonatology in the British Isles is traced from 1634 to the present and reference is made to the contributions made by British odonatologists to the knowledge of the fauna of other regions and to odonatology in general. Among the portraits accompanying the paper, those of K.J. MORTON (1858-1940), H. CAMPION (1869-1932), and N. MacNEILL (1899-1969) had not been published previously.

I have been asked to give a brief account of the history of odonatology in the British Isles and of British odonatologists. There are a number here present who are eminently more qualified than I am for this task. But doubtless modesty would prevent them from doing justice to their own contribution to the Science. Whereas I myself, having contributed nothing, need have no such inhibitions.¹

Probably the earliest publication in this country to deal with dragonflies at all, though they formed only a very small part of the whole, was "Insectorum Theatrum" 1634, by Dr THOMAS MOUFFET (1533-1604). He did not name any dragonflies, but attempted a very rough classification, dividing them into *maxima*, *media*, and *minima*, roughly corresponding with the families *Aeshnidae*, *Libellulidae*, and the *Zygoptera*, and among his primitive figures we can recognise *Libellula depressa* and *Calopteryx virgo*. It was not a great contribution to our Science, but it was at least a beginning. The worthy Doctor is now forgotten, though notorious in his own day as an eccentric owing to his passion for arthropods, a love apparently not shared by his family. His daughter is still remembered in the nursery, and our children sing of Little Miss Muffet who sat

* Invited Lecture, presented at the Opening Session of the Symposium.

¹ Cf. *Editorial Note* on p. 10.

on a tuffet, and how there came a big spider who sat down beside her, and frightened Miss Muffet away.

Serious work on classification, and all the other branches that only became possible when the systematic foundations have been laid, began with Linnaeus and his disciple Fabricius. An early British entomologist was DRU DRURY (1725-1803), a wealthy goldsmith and amateur collector, especially of foreign insects. He corresponded with Linnaeus, who had a high regard for him, and published three volumes of "Illustrations of Exotic Entomology", 1770, 1773, and 1782, with beautiful copperplate illustrations in colour by MOSES HARRIS (1731-88). Although Drury's book was confined to foreign insects, including dragonflies, he figured the three main types of larvae of the British species, and devoted a few pages to observations on the general pattern of their life histories. Apart from this, these volumes are of little relevance to British odonatology, but as we have so many present at this gathering who have worked for longer or shorter periods in Tropical Africa, it may be of interest to note that Drury was the first to figure, describe, and name (as two separate species) *Libellula lucia* and *L. portia*, which we now know as *Palpopleura*, from specimens he had received from Sierra Leone, and of the feeding of whose larvae Dr Hassan will be telling us something at a later meeting.

MOSES HARRIS also produced a book himself entirely on British insects in 1782 ("Exposition of English Insects") with 16 different dragonflies shown on 7 plates. It was he who first recognised *Calopteryx splendens* as a distinct species. Linnaeus had considered it merely a form of *C. virgo*. He also gives a figure recognisable as *Cordulegaster boltonii*, but unfortunately gave it a name properly belonging to something entirely different. The species was given its currently accepted name by EDWARD DONOVAN (1769-1837) who published "The Natural History of British Insects" in 16 volumes between 1792 and 1813. Donovan also includes figures of what he calls "*Libellula scotica*", a species previously described by Sulzer from Switzerland as *L. danae*.

The next British entomologist to publish extensively on the order was WILLIAM ELFORD LEACH (c. 1790-1836), who was a worker at the British Museum. He contributed the section on Entomology to the Edinburgh Encyclopaedia, published 1815. This was the first attempt to classify the British Odonata as a whole. He gives the names of 12 species of Anisoptera, one of them new, *Anax imperator*, and describes four new genera, *Gomphus*, *Cordulegaster*, *Anax*, and *Cordulia*. He does not name the different species of Zygoptera, but arranges them in three genera, two of them new, *Lestes*, and *Calepteryx* (spelling later corrected by Burmeister to *Calopteryx*). In making this beautiful and expressive name for the genus with coloured-winged species, *virgo* and *splendens*, he overlooked the fact that the French worker Latreille had in 1810 fixed *virgo* as the type-species of Fabricius' genus *Agrion*, which up to the time of Leach had included the whole of the Zygoptera. Leach really did a very good and

comprehensive piece of work in making these six new genera. On looking through our programme, I see that we have four papers on today's agenda dealing with species belonging to four of Leach's six genera, *Cordulegaster*, *Anax*, *Calopteryx*, and *Lestes*.

Another worker about the same time was JOHN CURTIS (1791-1862), a printer and engraver with a lifelong interest in Entomology, who produced 16 volumes entitled "British Entomology" between 1823 and 1840. This is not a systematic work, but a random series of beautiful engravings, each devoted to a single species of insect, butterfly wasp or beetle in any order, and each with a beautifully delineated British flower in the background, relevant or not, — even a dipterous parasite of bats has its accompanying flower! — and a page or two of text giving the name of each, a bibliography, and what was known of its biology. Three of the plates are of dragonflies, one of them *Cordulia* (now *Oxygastra*) *curtisii*, found by his friend Mr Dale, and named after the engraver of the plate.

JAMES FRANCIS STEPHENS (1792-1852), a civil servant in the Admiralty and keen entomologist, was seconded to the British Museum to help Leach arrange the collections. He published between 1824 and 1839 "Illustrations of British Entomology" in 12 volumes. He increased the list of British Odonata to 48, but only 32 of these are now recognised as British. Others are synonyms or casual vagrants not really members of our fauna.

In 1833, in a paper in the Entomologist's Monthly Magazine, EDWARD NEWMAN split up *Libellula* as it then stood, to make two important new genera *Orthetrum* and *Sympetrum*.

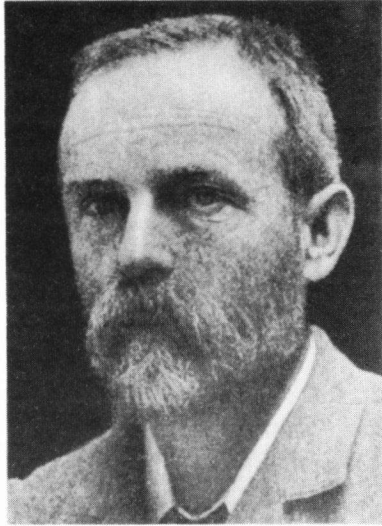
A colleague of Stephens in the Admiralty, WILLIAM FREDERIC EVANS, produced a small book "British Libellulids" and described a new genus *Brachytron*, but as this was printed privately the name was not validly attributable to him. It was used again in 1850 by Selys, so the latter is the valid authority for the name.

In 1845, this country was honoured by a visit from the acknowledged "Father of Odonatology", the Baron EDMOND de SELYS-LONGCHAMPS, who besides collecting himself, also personally examined most of the Museum and private collections in England, Scotland, and Ireland. The following year he published an article in the Annals and Magazine of Natural History, listing 46 species as British. One of these was a synonym, and 7 others very occasional migrants or never seen from Britain at all. But he did add *Somatochlora arctica*, and *Sympetrum fonscolombei* to our list.

A young friend of de Selys, ROBERT McLACHLAN (1837-1904) made a large collection of Odonata and Neuroptera from all over the world, and exchanged material with Selys. He pruned the British list, making *Sympetrum striolatum* and *S. vulgatum* synonyms, which is incorrect, but including 40 species which are still recognised as British. He established *Aeshna coerulea* and *Somatochlora arctica* as breeding here. At about the same time Dr BUCHANAN



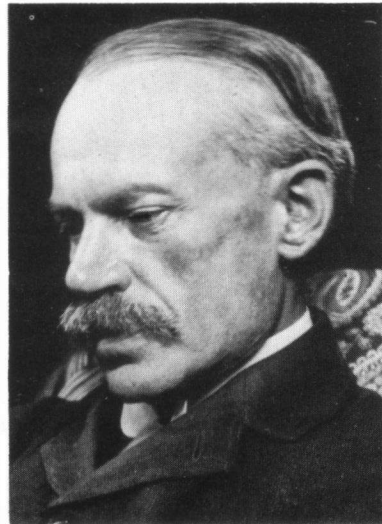
R. McLachlan (1837-1904)



W.J. Lucas (1858-1932)



K.J. Morton (1858-1940)



H. Campion (1869-1924)

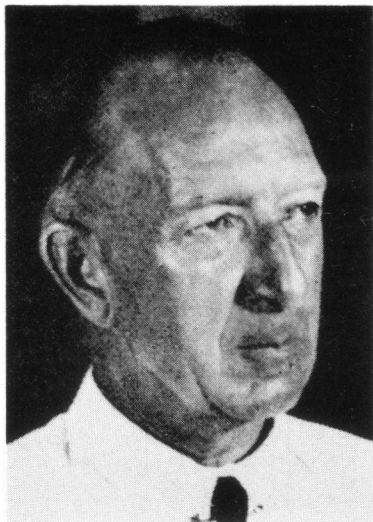
WHITE, and Mr J.J.F.X. KING collecting in Scotland had both found *S. metallica*.

In 1890 WILLIAM FORSELL KIRBY (1844-1912) published his "Synonymic Index of Neuroptera Odonata" which helped considerably in clearing up many problems of nomenclature, although unfortunately de Selys and others refused to accept many of his conclusions. He pointed out that the type of *Agrion* had been fixed as *virgo* as far back as 1810, and reinstated this instead of *Calopteryx* introduced five years later, and made a new genus *Coenagrion* for the smaller species which had been called *Agrion* by those who had adopted *Calopteryx*.

Among those whose work spanned both this century and the last was KENNETH J. MORTON (1858-1940), who worked in a Bank, and was a keen collector of Odonata and Neuroptera. During his holidays he collected extensively on the Continent of Europe, and rediscovered *Macromia splendens* in France, which had not been seen for 50 years. In England he was the first to find *Lestes dryas* and *Sympetrum fonscolombi* breeding. He reported on various collections made in Africa, and described new genera and species. His collection is now in the Royal Scottish Museum at Edinburgh in the care of A. RODGER WATERSTON, who continues the work on Odonata and Neuroptera and specialises on those of the Middle East and Arabian Peninsular. Morton was a great correspondent, and his letters have been compared to those of Gilbert White. I met him once when I was a student, and he saw me beating insects out of a bush on a heath near Edinburgh. He came over to see what I was doing and introduced himself. Unfortunately he was very deaf, and this made communication difficult.

His contemporary WILLIAM JOHN LUCAS (1858-1932), a schoolmaster, produced in 1900 a beautifully illustrated volume on "British Dragonflies", giving descriptions and coloured plates of 39 British species, and added two more, *Coenagrion armatum* and *C. hastulatum* in a paper published a couple of years later. For many years this was the only book available, and is the one on which I myself was brought up. It is still mainly a systematic work on the adults, like all the work of the last century, while the foundations were being laid. The way was now open for more biological work, larval stages, life-histories, physiology, and ecology. Professor FRANK BALFOUR-BROWNE studied the life-histories of some of the Zygoptera during the first decade of this century, bred *Coenagrion pulchellum* and *Ischnura elegans* from egg to adult for the first time, and published the classic paper "The Life-history of the Agrionid Dragonfly" in 1909.

Another keen naturalist with a special interest in the Odonata was HERBERT CAMPION (1869-1924). He worked for the Imperial Bureau of Entomology, and was seconded to the British Museum as a Temporary Assistant for the last three years of his life, which was all too short and dogged by ill-health. Several



F.C. Fraser (1880-1963)



R.J. Tillyard (1881-1937)



N. MacNeill (1899-1969)



P.S. Corbet (1929-)

well-known species of African dragonflies were first described by him.

The next important work on dragonflies was from ROBIN JOHN TILLYARD (1881-1937), a Cambridge scholar who migrated to Australia where he held various research and teaching posts. In 1917 he brought out "The Biology of Dragonflies", quite unlike any book previously written, and in no way duplicating that of Lucas. It is worldwide in its scope, leaving the British species to be considered in a single chapter at the end. He deals with anatomy, embryology, physiology, palaeontology, and classification, as well as general natural history. Both Lucas and Tillyard clung to the old Selysian names, and rejected Kirby's historically correct change from *Calopteryx* to *Agrion*, and *Coenagrion* for the smaller forms, Tillyard very forcibly. But one of his characteristics was his willingness to change his mind and swing round to the opposite viewpoint whenever he found an argument convincing enough to justify this. So when he reclassified the Order in 1926 he adopted *Agrion* instead of *Calopteryx*. A friend and collaborator of Tillyard, with whom he had many an argument to their mutual advantage, was Colonel FREDERICK CHARLES FRASER (1880-1963), who spent most of his professional career in the Indian Medical Service, and wrote a definitive work in three volumes on dragonflies in the "Fauna of British India" series, which laid the foundations of odonatology for the Indian Subcontinent.

W.J. LUCAS was meanwhile continuing his work with larvae, and in 1930 brought out "The Aquatic (Naiad) stage of British Dragonflies" with coloured plates of the larvae of 32 of our species, painted by himself, and descriptions of most of the others. But it would give a one-sided view of Lucas's work if we confined ourselves to his publications. He was also a great teacher, and stimulated younger workers unstintingly. I did not become seriously interested in dragonflies myself until much later, but as a student I passed through a phase when I was a keen collector of everything. So I wrote to Lucas with a list of my dragonfly records for that year, and received a kind and encouraging reply. We continued to correspond for two or three years until his death in 1932.

Meanwhile a new generation was coming to the fore in this country, DOUGLAS KIMMINS and CYNTHIA LONGFIELD, both working at the British Museum and doing stalwart work. Fortunately they are both still with us, and should have both been here today as Guests of Honour of this Symposium, though unfortunately Douglas Kimmins' state of health has prevented him from accepting the invitation. Both have continued Lucas's practice of publishing periodic lists of the occurrence of our species, either local or nation-wide. In 1946 Cynthia found in Essex a species new to Britain, *Coenagrion scitulum*; but alas it seems to have become extinct here since 1953 when the North Sea burst in on the Essex marshes and destroyed its only known habitat in this country. She produced the volume on Dragonflies in Warne's "Wayside and Woodland" series in 1937, with a second enlarged edition in 1949. As Lucas's book had long

been out of print, and out of date, these volumes provided an enormous stimulus to the study of the order, and made her large numbers of new friends, who kept her busy with their enquiries, and could always feel sure of encouragement and help to the full. This Symposium can consider itself honoured that although still kept busy in her retirement she has taken the trouble to come over from Ireland to be with us.

While she and Kimmins were starting their work at the British Museum, Col. FRASER was going strong in India, retiring in 1933. From then on he worked on the Odonata of all parts of the world, especially Central Africa. He continued to correspond with Tillyard until the death of the latter in 1937, and completed the posthumously published "Reclassification of the Order Odonata" that Tillyard was working on and had nearly completed by the time of his death. He produced

a revised version of this in 1957. At the request of the Royal Entomological Society of London, he wrote a "Handbook for the Identification of the British Odonata" in 1949, with a second edition in 1956. I corresponded with him a great deal during the last few years of his life, though we never met. Soon after I returned to live in this country, he invited me down to visit him and discuss various problems, but he died suddenly a few days before my visit was due.

A fellow student of mine at Cambridge, JOHN COWLEY, had started in a quiet unpretentious way to make a lifelong study of the order. We were fairly close friends, but I only discovered by accident that he was interested in them. He seldom mentioned his interest, but he was a great expert, and collected through correspondents from all parts of the world. As far as I know, he never travelled far abroad or practised any profession, but just worked quietly at home, interrupted by periods of ill-health. But within a year or two of his leaving Cambridge, Fraser was consulting him on a number of matters, and accepting and quoting his opinion without question. Fraser was a strong-minded man, and dogmatic in his views; always ready to lay down the law, less happy to listen; so the way he accepted the opinions of one who had been an under-

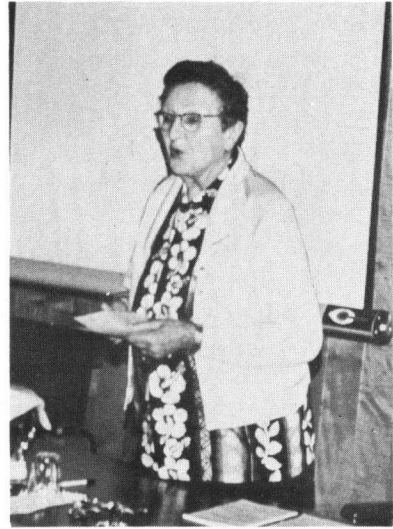


Fig. 1. Miss Cynthia LONGFIELD, Doyen of British odonatologists, delivering her lecture at the Third International Symposium of Odonatology, Lancaster, July 15, 1975. — (Photo: B. Kiauta).

graduate only a year or two previously is a great tribute to Cowley's knowledge. He was a great classic, and expert on the derivation of names, also on the Code of Nomenclature. We corresponded at rather irregular intervals until his death eight years ago, a great loss. His extensive collection and his various card-indices are now in the British Museum. His place is more in the history of World odonatology than of British, but he was – with KIMMINS, Miss LONGFIELD, and the late Dr KILLINGTON (the Neuropterist) – on the Subcommittee appointed by the Royal Entomological Society of London to report on the Generic Nomenclature of the Neuropteroid Groups. The report was published in 1935 (when Cowley can only have been about 25!).

A new generation of British odonatologists has appeared since the war, probably all and certainly most, owing everything to Cynthia Longfield and her books. ERIC GARDNER has bred all or nearly all our species from egg to adult, and has published beautifully illustrated accounts of about half of these. We wait anxiously and impatiently for him to find time to get the remainder of his work written up. He has also added a species to the British list by vindicating *Sympetrum nigrescens* as a distinct species. It was described as new by Lucas in 1912, but was later considered only a synonym of Selys' subspecies *S. striolatum nigrifemur*. This however appears confined to the Canary Islands. Gardner visited the Canaries, collected *nigrifemur*, and found that it was a full species and quite distinct from either *striolatum* or *nigrescens*.

Gardner collaborated in some of his work on larvae with an older worker, the late Colonel NIALL MacNEILL of Dublin (1899-1969), who worked in the Ordnance Survey. He was a skilled draughtsman, and all his papers are most beautifully illustrated. He had interesting views on the origins of duplex gills in Zygopterous larvae, and on the functions of the pterostigma. I never met him, but we corresponded extensively, and I found his ideas most stimulating. He was a charming man, and most courteous even when we disagreed strongly, which we sometimes did though only on minor matters.

CYNTHIA LONGFIELD's latest book, "Dragonflies" in the Collins "New Naturalist" series, was written in collaboration with two other younger workers, PHILIP S. CORBET, who had taken his doctorate on the ecology of larvae, and NORMAN MOORE who had taken his on adult behaviour. Dr Moore is still working in this country, and we have the privilege of having him with us today. I need say nothing of his work as he will be speaking to us himself. Professor Corbet has worked in a number of other countries, Uganda, Canada, and now New Zealand, unfortunately too far away for him to be with us. His classic work was on the life-history of *Anax imperator* and on its seasonal regulation, and he extended his observations on this to other species. He introduced and defined the terms Spring and Summer species in relation to Diapause. He was joined in his earlier work in this country by his sister Sally, and she has used some of his *Anax* techniques for species of *Aeshna*. In 1962 he produced "A Biology of

Dragonflies", probably the most epoch-making book on dragonflies ever to have come out in Britain. It is mainly from the ecological and physiological angle, and on these and on their general biology it says the last word. At least, — until he writes his next book!

Most of the work carried out in Britain at present is ecological or physiological. Dr M.J. PARR has worked on the ecology of larvae, and on the rate of maturation of the adult, both in this country and during the three years that he spent in Nigeria. I need say nothing about this, as he will himself be leading our expedition tomorrow over the ground where he has been working, so we shall doubtless be hearing it all from him direct. Dr T.T. MACAN has done a great deal on larvae, both of Odonata and Trichoptera, and on Freshwater Biology in general, and I hope we shall be hearing something of this from him on the spot on Friday. And Dr P.J. Mill has worked on rectal ventilation in Aeshnid larvae. One British odonatologist whom I never met is C.O. HAMMOND, who found one of the few *Sympetrum vulgatum* caught here, soon after the war; and from whom, — according to rumour — we may be expecting a new book on British dragonflies in the not too distant future. And there are other young men and women coming up of whom we may not yet have heard but of whom we doubtless soon shall. I have said nothing of those who have left this country and gone abroad to work, unless they have done important work on the British Odonata as well. Hence no reference has been made to men like J.A. WHELLAN; or his more famous disciple ELLIOT PINHEY, who having worked successively in South Africa, Kenya, and Rhodesia, has a widely based knowledge of the African dragonflies, on which he is the acknowledged expert. History, being a continuous process, does not end; and refuses to be wound up to reach a tidy conclusion. I will therefore break off this historical survey abruptly, and leave the Symposium to get down to its more serious business, hoping that our discussions may make a little more History.

EDITORIAL NOTE — Mr Robert Moylan GAMBLES is one of the most distinguished living British odonatologists. Most of his work and publications are devoted to taxonomy and biology of West African Odonata, particularly to those of Nigeria. He is also acting as an excellent mentor of a number of young British and Nigerian dragonfly workers. The Editors are happy that he accepted the invitation of the Organizing Committee of the Symposium to prepare the present historical review.