

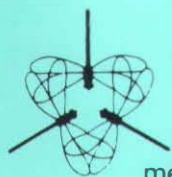
Journal of the British Dragonfly Society

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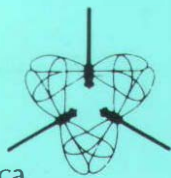
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Editor: D. Tagg



member of the Societas Internationalis Odonatologica



The *Journal of the British Dragonfly Society*, normally published twice a year, contains articles on Odonata that have been recorded from the United Kingdom. The aims of the British Dragonfly Society (B.D.S.) are to promote and encourage the study and conservation of Odonata and their natural habitats, especially in the United Kingdom. The B.D.S. is a member of the Societas Internationalis Odonatologica (S.I.O.).

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The first ten years of the British Dragonfly Society¹

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1. Introduction

The events that led to the formation of the British Dragonfly Society (BDS) in 1983 have been described by Bob Merritt (1987). In the present article, completed in April 1993, I review some of the main developments that took place during the first decade of the Society's existence. In compiling this account, I have received advice or material from almost all members of the Society who were associated closely with the developments reported here (see Table 1). Notwithstanding this input from members, emphases in the article are necessarily mine; so to that extent it must be regarded as a personal narrative. Apart from placing factual details on record, a review like this may be useful to future BDS members, especially those serving on the Committee, by helping to reveal the thinking behind some of the Society's decisions.

2. Constitution and By-Laws

The original Constitution and By-Laws, distributed to members in November 1983, and revised versions of these documents, including those approved by the membership in May 1993, can be made available to members from the BDS Archives. Changes to the Constitution, which affect Articles V and VI(c) of the 1983 version, were made necessary by the registration of BDS as a Charitable Trust (see section 4 below). Changes to the By-Laws relate to: the size and composition of the Committee and the terms of service of its members; the way the Committee makes appointments; the establishment of an Executive Committee and Dragonfly Conservation Group; the addition of new categories of membership; and the consequences that the status of BDS as a Charitable Trust has for the name applied to the Committee and for the Society's association with other organisations, including the International Odonatological Society (SIO). These changes are amplified below.

3. The Committee

Because the administrative arm of the Society was called the 'Committee' during most of the period covered by this article, I have retained this nomenclature; but from 1993 onwards the Committee will be called the 'Board of Trustees' to conform with the requirements of the Charity Commission. Likewise, the President and Vice-President will be

¹ This article, in its present form, has been endorsed by the Executive on behalf of the Board of Trustees of the British Dragonfly Society.

called the 'Chairman' and 'Vice-Chairman' respectively; but no functions have changed as a result. Membership of the Committee is shown in Table 1. Terms of service for ordinary members were made unequal initially to allow terms to be staggered subsequently. In 1989 the complement of ordinary members was increased from three to four, and the terms of service of the Vice-President and ordinary members were increased from three to four years; and in 1992 the term of service of the President was reduced from six to four years. The intention has been to keep the Committee fairly small, to maintain a majority of elected, as distinct from appointed, members, and to invite a few other persons (e.g. Co-ordinator of Odonata Recording Scheme at the Biological Records Centre, Fund-raising Officer, Legislation Officer) to attend meetings as non-voting observers. Because absences are rare, this means that Committee meetings are usually attended by 10-13 people, ten of whom are entitled to vote; of these ten, six are elected. The first full Committee meeting, comprising seven people, was held at the University of Leeds on 26 October 1985. Since then meetings – each normally occupying six to seven hours – have been held annually on the day after the Indoor meeting (which includes the Annual General meeting). Members regard the Committee as very much a working forum; most discharge a specific responsibility for the Society in addition to their service on the Committee and so can report directly on some area of BDS activity. As it has gained experience, the Committee has managed to use its time increasingly effectively, preparing and circulating reports and working papers before each meeting, indicating on the Agenda which items are to be discussed and which taken as read, and producing the Minutes promptly for members' scrutiny. Although provision exists for this to be done, it has not so far proved necessary to hold more than one meeting in any year. Indeed, members may take more seriously the Committee's role as a working forum *because* there is only one meeting a year. Urgent business between meetings is either dealt with by telephone or, more commonly, attended to by the Executive Committee, established in 1989, which acts on behalf of, and is responsible to, the main Committee. Like any other association whose Constitution requires that it operate democratically, BDS has had to strike a balance between centralising and decentralising decision-making. It has done this by enabling the Committee – or its instrument, the Executive Committee – to make decisions swiftly, and by ensuring that the Committee comprises a majority of persons elected by the membership at large. All elections are conducted by postal ballot. As a precaution against the real possibility that no nomination for a vacancy is received from the membership in time, the Committee itself usually contributes a nomination (so far always supported unanimously) for each position.

4. Offices of Secretary and Treasurer

The Secretary and Treasurer have always worked closely together and it is often not feasible in this report to try to consider their activities separately. Since 1989 the Secretary and Treasurer have constituted a husband-and-wife team that has made excellent use of the logistical advantages offered by such an arrangement. Accordingly I review both these offices in a single section, expecting that distinctions between them, where appropriate, will become evident from the context.

Within two months of the publication in April 1983 of the first Newsletter, and its despatch to all members in Britain of the Odonata Recording Scheme and the International

Odonatological Society, membership of BDS was approaching 220 (Merritt 1987). Thereafter it rose slowly but steadily (Table 2), passing 500 during 1988 and 1000 during 1992. This growth occurred notwithstanding the Committee's explicit policy of not actively recruiting members (Minutes 87/5 and 88/17) and despite the practice of some people of allowing their membership to lapse after a few years. Recalling the excitement of receiving the first registrations in 1983, Roderick Dunn wrote (1992): "I shall never forget the thrill as the first returned membership form dropped through the letter box. There were four the following day, then a dozen, including our first overseas member. After a few weeks we had reached our initial membership target [about 180 in order to cover marginal costs of the Newsletter] and the Society was up and running." In 1988 two new categories of member (in addition to the Ordinary membership) were approved: Honorary and Life membership. The Committee was delighted when in 1988 the late Cynthia Longfield, a person whose contributions to British odonatology had laid the foundation on which BDS is based (see Corbet 1991), accepted its invitation to become the Society's first Honorary member. The other three categories of membership, identified in Table 2, were incorporated in the By-Laws in 1993. They offer the opportunity to receive the Society's Journal (Library membership) or certain benefits (lectures, advice etc.) in return for a higher annual subscription (see Newsletter 22 of autumn 1992, page 4): Corporate membership caters for County and Borough Councils, commercial institutions etc. and Associate membership for bodies concerned with conservation and education. A further, unofficial category – Reciprocal membership – was established in 1992 and so far includes four associations: the British Butterfly Conservation Society, Gesellschaft deutschsprachiger Odonatologen, SIO and Société Française d'Odonatologie. The 47 Ordinary members from outside Britain live in Algeria, Austria, Canada, Denmark, Finland, France, Germany, Hong Kong, India, Italy, Luxembourg, The Netherlands, Norway, Portugal, South Africa, Sri Lanka, Sweden and U.S.A.

By 1986 the Secretary was having to spend a great deal of time dealing with routine mailing, as well as sometimes responding to 60 letters in a week (Minutes 86/5); so in 1987 the Committee approved a proposal to employ a small computer mailing firm (Tern Data) to keep membership and subscription records, issue reminders and address envelopes for the twice-yearly mailings to members. This decision freed the incoming Secretary and Treasurer to develop a wider array of initiatives than would otherwise have been possible. Indeed, to look at the hand-written ledgers used by the Secretary and Treasurer prior to 1988 is to marvel that these officers managed so well, especially as all had full-time jobs to occupy them also.

Since 1986 the Secretary has been active on behalf of the Society in ways too numerous to do justice to here. Those that especially deserve mention are: the despatch and analysis of a questionnaire; editing and production of the Newsletter; publicity; and fund-raising.

A questionnaire soliciting members' views on appropriate future activities for the Society produced many thoughtful and interesting suggestions (Newsletter 13 of spring 1988) subsequently reflected in the content of the Journal and Newsletter, and in the form taken by Field trips and the Indoor meeting. Most respondents wanted BDS to remain an institution catering for the interested and informed 'non-expert'. Since it first became a publication distinct from the Journal (with issue 2 of September 1983), the Newsletter has filled this need admirably, appearing in spring and autumn each year and, since issue 6, comprising about 9 pages per issue. Now, after more than 20 issues, the Newsletter provides an indispensable

source of information and communication for the membership, and it is now no exaggeration to call it 'the glue that holds the Society together'. Issue 22 of autumn 1992, which contained more than 14,000 words, was printed on coloured paper to mark the passing of the 1000 membership mark! The content of the Newsletter is very varied. Apart from announcements and reports of meetings (Annual General, Committee, Field, Indoor), it includes frequent accounts of conservation activities, news from local groups, and advertisements of interest to odonatologists.

It is consistent with the present Secretary's determination (shown also by her predecessors) to keep her finger on the pulse of the Society that she should act as prime mover where publicity is concerned. On being appointed the Society's first Publicity Officer in 1986, she was advised by the Committee that the Society's relevant policy was to rely on natural growth of the membership and to aim to provide assistance (advisory, financial) to larger, well-established conservation bodies when to do so would help to protect dragonflies and their habitats. Action accordingly took two forms: publicising the Society and its aims; and promoting awareness of dragonflies and their habitats. Since 1990 BDS members have contributed six articles annually on dragonflies to the Wildlife Reports feature in *British Wildlife*. Among articles written by members, including the Secretary, and published in a variety of periodicals was a profile of BDS (by Bob Kemp) in *BBC Wildlife Magazine*, publication of which was promptly followed by a surge of enquiries and membership applications — a pattern that has tended to be repeated after each exposure of the Society in publications or the media. For example, after Steve Brooks had appeared on the television programme *Gardener's World*, helping schoolchildren to dig a pond for dragonflies, the Secretary received well over 1000 letters from interested viewers, 49 of whom joined BDS (see also Newsletter 22 of autumn 1992, page 10). During three months in 1989, Peter Allen provided entries relating to dragonflies for the Ceefax Country Diary on national television. An increasing number of displays and exhibits has been set up at fairs and exhibitions around Britain, the largest and most elaborate being the stand mounted by the Society at the Sunday Times Environment, Wildlife and Conservation Exhibition at Olympia, London in July 1991. Members contributed to the stand in various ways, including design, provision of materials (living as well as non-living!), construction, manning and donating money to cover costs.

Another type of publicity generated by the Society, usually with substantial input from one or more members of the Dragonfly Conservation Group (see section 8) comprises booklets, information sheets and leaflets (e.g. *Dig a pond for dragonflies*, *Dragonflies are at risk*, *Dragonfly fact sheet*, *Pond construction for dragonflies*, *What we do*) that are continually being distributed to reserves, museums and schools throughout the United Kingdom. A handsome wall chart, featuring water-colour illustrations by Dick Askew of all species of dragonflies in Britain and Ireland, and published by Harley Books in association with BDS, has also achieved wide distribution. These initiatives, together with the efforts of members when lecturing about dragonflies and their habitats, have made the Society well known in Britain and western Europe in the field of nature conservation.

In 1988, after much preparatory work, BDS became a Registered Charity. This meant that, in the first instance, it became exempt from income tax on interest payments from banks and building societies; and this, in turn, allowed the Society to offer favourable terms for Life membership, a provision that has to date attracted more than 160 members. Later this benefit was increased further when the Inland Revenue agreed that Life-membership subscriptions could be paid by Deed of Covenant spread over four years. The net financial result has been

a level of interest on an investment that, on average, has exceeded the amount that would otherwise have been received in annual subscriptions; and administrative costs have been reduced because fewer annual subscriptions have had to be collected. Other implications have been that BDS could no longer remain *affiliated* with the International Odonatological Society (although the two Societies remain associated through Reciprocal membership) and that, as mentioned in section 3, the Committee became a Board of Trustees with a Chairman and Vice-Chairman. From the outset, the objective of fund-raising (an activity to which the present Secretary has made an essential contribution since 1986) was not to try and raise large sums of money for major ventures but to build up a secure reserve of cash so that, as necessary, the Society could expect to help with the financing of suitable projects at short notice, restoring or augmenting the needed funds by *ad-hoc* appeals to the membership. To this end, goods have been offered for sale, both at the annual Indoor meeting and through the Newsletter. Starting with car stickers in 1987, an increasing variety of goods, including brooches, mugs, jerseys, shirts, ties and videocassettes, has sold steadily, providing a modest but useful income, augmented by proceeds from a raffle, now a regular feature of the Indoor meeting and most prizes for which are purchased using petrol tokens and trade stamps donated by members. (Gross takings at the Indoor meeting in 1990 and 1991 were about £950 and £830 respectively.) The other principal sources of income to date have been donations, generated spontaneously or in response to the routine invitation on the subscription renewal form and the Corporate and Associate memberships. Despite focused efforts towards this end, especially by the Fund-raising Officer serving in 1991, BDS has not so far been able to obtain major sponsorship from a commercial organisation, although sizable grants have been secured from the Department of the Environment towards the publication costs of conservation literature and of a pond-construction booklet.

The developments mentioned above, together with a steadily rising membership, have produced a marked improvement in the Society's financial position (Table 3), even though the subscription for Ordinary membership has remained modest, being £4.00 in 1986/1987 and £5.50 since 1988. This rapidly rising income, coupled with careful financial management, has allowed the Society to increase considerably the scope of its activities related to conservation and education.

5. Office of Editor

The main responsibility of the Editor is to produce the *Journal of the British Dragonfly Society*, a publication that from the outset has appeared twice a year and that contains articles on dragonflies recorded from the United Kingdom.

The articles in the first issue of the Journal were published twice: first, in April 1983, as part of Newsletter 1, which also contained news and announcements later regarded as being out of place in the Journal as we now know it. Accordingly, when a policy for the Journal's content had been formulated (Newsletter 2 of autumn 1983), the articles in Newsletter 1 that were deemed suitable for the Journal were republished, on their own and with different pagination, as Volume 1, No.1 of the Journal (see Newsletter 6 of winter 1984/85) which, though dated April 1983, was not published until February 1985 — after Volume 1, Nos 2 and 3 (i.e. 1/2,3). The appearance of the Journal has changed relatively little since the first number; the existing format was established in 1/4 and the lay-out has improved in various

small ways. The main changes in appearance comprise the introduction of 'stiff' covers (in 3/2), and the change in type-face from Times to Chelmsford (7/1). Certain standard features have been added: instructions to authors (1/4); recent odonatological publications likely to interest members (5/1); a list of common names of British species and their scientific equivalents (7/1); brief notes and observations (7/1); and names of Corporate members of BDS (7/2). An index to Volumes 1-4 was published in 1989. Ann Brooks helped Steve Brooks with the editing between 1/5 and 7/2. An editorial appeared in 8/1 to mark the change of Editor.

Volume 1, published between April 1983 and December 1985, contained 6 parts, 122 pages, 42 articles and 2 book reviews. Volumes 2-8, each published annually and each of 2 parts appearing in April and October or November, each contained 40-52 pages (average 45.7) and 9-16 articles (average 11.1); these volumes also contained 12 book reviews and 1 obituary. A table detailing the contents and dates of publication of parts of the Journal has been deposited with the BDS Archivist.

Articles have covered a wide range of topics, including behaviour, bionomics, conservation and pond construction, distribution, folklore and vernacular names, history of recording, monitoring, origins of BDS, palaeontology, pollution effects, rearing, recognition characters, regional and local species lists, and terminology. The section devoted to brief notes and observations constitutes a valuable source of information, usually anecdotal, on phenology and behaviour that might otherwise have remained unavailable to odonatologists. Compiled by Alan Paine, this feature began in Newsletter 12 of winter 1987, moving later to the Journal.

Since 1984 the Editor has never been short of copy but at the same time has never had enough to have an entire number in reserve. About five submitted papers have had to be rejected, although several have been published after receiving extensive editorial attention. That the Journal compares favourably with other entomological periodicals having a comparable readership, and that the number of longer articles submitted by members has increased during the last few years indicates that the editorial policy and its implementation have been appropriate, resulting in a publication that is rigorous and at the same time 'member friendly', there being a healthy diversity of authors and topics.

The existence of the Journal helps to provide an identity for BDS, and in its present form probably helps to enhance the credibility of the Society when it makes recommendations on species and habitat conservation.

Other products of the Editor's Office have been the attractive and highly functional application form that appeared in early 1991, and an illustrated fact sheet outlining salient features of dragonfly biology. A potentially attractive arrangement whereby articles of regional interest would be published jointly by BDS and SIO has not so far borne fruit, largely because articles that would have been eligible have been published by local organisations.

6. Patron

Following a decision of the Committee (Minutes 90/19), in March 1991 the Honourable Miriam Rothschild, CBE, FRS, accepted the Society's invitation to become its first Patron. When deciding to approach Dr Rothschild, the Committee had agreed that: the Society wished to have as a Patron someone who would become actively involved in its

affairs, identifying with its objectives and helping it to gain influence; the decision to approach a possible Patron and the choice of whom to approach would be by unanimous agreement of the Committee; and appointment of a Patron would not commit BDS always to have a Patron.

7. Indoor meetings

The first Indoor, or 'Winter', meeting, attended by about 70 people and featuring 5 talks, was held at the Biological Records Centre, Monks Wood Experimental Station, Abbots Ripton on 12 May 1984. Since then Indoor meetings have been held annually, in October or November, alternately at the Department of Pure and Applied Biology, University of Leeds (first in 1985) and the Department of Zoology, University of Oxford; they have been attended by about 70-160 people (since 1988 usually by at least 100) and have featured 5-11 talks (average 7.5). Details of these meetings have been deposited with the BDS Archivist.

The enthusiasm and interest that characterised the first meeting in 1984 have not diminished; and the Committee may soon be faced with the need to find yet more capacious premises as a venue. These meetings serve several different functions, each of considerable benefit to the Society. Standard features now include the holding of the Annual General meeting and the presentation of lectures and photographs on a wide variety of odonatological topics, examples being: dragonflies as decorative art; the dragonflies of Nepal; monitoring dragonfly populations; peatland conservation; photographing dragonflies; and high-speed films of dragonfly behaviour. Just as valuable are the less formal activities such as the sale of goods, the raffle held in support of BDS aims, the display of posters, publications and specimens, and probably most important of all, the opportunity for members to interact socially and informally at a national rather than a regional or local level.

The frequency, location and format of the annual Indoor meeting have been much discussed by the Committee. From the second meeting onwards, the practice has been to hold it on a Saturday, usually from about 11 a.m. to 5 or 6 p.m. (the Committee meeting taking place the next day) and on a date suitably placed in relation to mailing of the autumn Newsletter (in which the programme is announced) and to any preparatory actions needed for elections the following year. Since 1990 an entrance fee of up to £2 has been payable. The formal programme, which has so far always included at least one talk on dragonflies from a region other than Britain, has since 1986 usually included a contribution from an invited speaker from continental Europe — an arrangement that strengthens links with the Society's counterparts in neighbouring countries. This pattern of the Indoor meeting seems to meet the wishes of most members, although the trade-off between lecture time and discussion time may always prove difficult to achieve to everyone's satisfaction. A report of each Indoor meeting is published in the next Newsletter.

Because the cost of holding meetings in some university departments continues to rise steeply, the attendance fee may soon have to be as high as the annual subscription to BDS. It seems unlikely that this will deter members from coming because the fee will remain small relative to the costs of travel and accommodation, at least for most of those attending. Questions that will continue to surface relate to the possibility of holding the Indoor meeting in places other than Leeds or Oxford (it is to be held in Cambridge in 1994) and the possibility of holding it at a university (or other venue) where there is no BDS member to take

responsibility for local arrangements. It is hardly necessary to say that a prerequisite for the success of future Indoor meetings is the availability of BDS members able and willing to organise the formal programme and local arrangements; and so far BDS has been singularly well served in these respects. The current locations are largely serendipitous (reflecting the existence of an appropriate member at a suitable place and time) but are sufficiently far apart in a north-south direction to provide reasonable access to most members, at least in alternate years.

8. Conservation

Article II of the Constitution leaves no doubt about the importance placed by the Society on the conservation of dragonflies and their natural habitats. Much valuable conservation work was done by members of the BDS in its early days but by 1986 there was a clear need for a focal point, to co-ordinate conservation initiatives within the Society and to facilitate liaison with cognate bodies. Accordingly, at the Committee meeting in Oxford on 19 October 1986, the Dragonfly Conservation Group (DCG) was inaugurated (Minute 86/9; By-Laws Article 2) with the following membership: Norman Moore (Convenor), Philip Corbet, Bob Kemp and Peter Miller. In 1988 the Convenor became an *ex-officio* member of the Committee. Steve Brooks joined DCG in 1988, and Peter Mill and Mike Parr in 1990; in 1992 Andy McGeeney (replacing Philip Corbet) and Brian Nelson joined DCG. The following year (Minutes 93/9.2) the Committee agreed that, subject to ratification by the membership, the President would be an *ex-officio* member of DCG, an arrangement that had existed *de facto*, but not *de jure*, since the inauguration of DCG. In 1993 the composition of DCG and the procedure for appointing people to it were further formalised (see Appendix II). Since 1989 DCG has held two meetings a year, one being a liaison meeting with the Biological Records Centre of the Institute of Terrestrial Ecology and the Nature Conservancy Council (NCC) or its four successor bodies. Indeed, since the dismemberment of the NCC in 1991, these meetings, which are usually attended by a representative from each country body, have performed an additional function by fostering communication among the country bodies on matters concerned with conservation of freshwater habitats and their invertebrate fauna. Each year both meetings have taken place on the same day, usually at Peterborough in the offices of the NCC and then of its successor bodies.

As Bob Merritt has described (1987), the establishment of the Odonata Mapping Scheme at the Biological Records Centre, Monks Wood was an event of great significance for the future formation of BDS. The ongoing task of mapping the distribution of dragonflies in Britain has gone from strength to strength, becoming formalised as the Odonata Recording Scheme (ORS) and later including the Odonata Key Sites Project (OKSP). Although many BDS members play important roles in ORS, especially as Regional Recorders, there is an interesting lack of overlap between ORS and BDS: some 60% of recipients of the ORS Newsletter are not members of BDS, and 70% of BDS members are not on the ORS mailing list (Eversham 1992). Because of the close liaison between ORS and BDS, the fruits of ORS and OKSP constitute an invaluable source of information for BDS, especially in regard to the latter's conservation activities. One outcome of great importance will be the publication (expected in 1993) of the *Atlas of the dragonflies of Britain and Ireland* by Bob Merritt, Norman Moore and Brian Eversham. Accounts of individual species make up about half the

book and the rest includes a detailed history of recording and an overview of its future, a summary of field techniques, analyses of seasonal distribution and a synopsis of the British fauna in a European context.

Much conservation work continues to be done without reference to DCG, and it is hoped that this state of affairs will continue, as long as it does not entail unnecessary duplication of effort or the transmission of conflicting messages to collaborating organisations. DCG has three main functions: to represent BDS on conservation matters nationally (and internationally); to help other conservation bodies conserve dragonflies on their nature reserves; and to support the conservation work of BDS members through publications and the support of individual schemes. Some of the ways in which these functions are put into practice are described below. Since its inception, DCG has been active across a broad front and the following account can only provide a brief, illustrative account of its activities. Names of members will be mentioned so as to make clear how the Group operates.

The break-up of NCC into four independent bodies in 1991 has made scheduling of new Sites of Special Scientific Interest (SSSIs) and the protection of existing ones more difficult than formerly. DCG has corresponded with NCC and the relevant Ministers seeking assurances about the continuity of SSSI procedures.

Lowland peatlands provide important habitats for many dragonflies including some rarer species. Many of the remaining peatlands are under threat and so DCG maintains a dialogue about peatlands with English Nature and with the Peatland Conservation Consortium plc, on which Steve Brooks represents BDS. The Peatland Conservation Consortium, which includes many non-governmental conservation organisations (e.g. Royal Society for Nature Conservation (RSNC), Royal Society for the Protection of Birds (RSPB), Worldwide Fund for Nature (WWF)), was formed in November 1989. As a result of the Consortium's high-profile campaign to raise public awareness, several large-scale peat producers have abandoned cutting, and some large retailers have refused to stock peat taken from SSSIs. For example, in February 1992 Fisons Ltd (although continuing to cut peat in most of their holdings) handed over to English Nature large areas of peatland, especially at Thorne and Hatfield Moor. BDS has participated actively in the peat campaign since its inception and so has contributed to this outcome. For example, BDS mounted a touring exhibition at the Wildlife and Wetland Trust Centres throughout England and Northern Ireland, highlighting the plight of dragonflies on peat bogs; members also submitted evidence to the Plantlife Public Enquiry into the use of peat and peatlands. This involvement illustrates how BDS can increase its effectiveness by collaborating with other conservation groups that share the same broad objectives. Steve Brooks also represents BDS on the Pond Conservation Group – a group of wildlife and countryside conservation organisations, university departments and representatives from local authorities that has growing influence and public appeal. Peter Miller has been involved with organising the national WATCH programme on dragonflies.

When asked to do so, DCG supports people or organisations trying to conserve dragonfly habitats overseas. The Lac des Oiseaux in northeast Algeria, which supports an unusual, overlapping assemblage of European and Afrotropical species, is under threat, and Norman Moore, who is also Chairman of the Odonata Specialist Group of the International Union for the Conservation of Nature and Natural Resources (IUCN), is exploring ways in which the conservation of dragonflies can benefit from the conservation of birds at this

outstanding site.

Close links with NCC and its successor bodies, with the County Wildlife Trusts and with the RSPB are being forged and have already borne fruit. Representation on the Joint Committee on the Conservation of British Invertebrates (JCCBI) and Wildlife and Countryside Link has provided valuable contacts with other non-governmental conservation bodies and has helped BDS to keep up with current thinking.

Bob Kemp played an important role in persuading the NCC to make Fenns and Whixall Mosses in Shropshire and Clwyd a National Nature Reserve. He is now advising English Nature and the Countryside Council for Wales about a study on the White-faced Darter, *Leucorrhinia dubia*, on the site. At the request of the Warwickshire Nature Conservation Trust, Norman Moore visited their reserves and advised on habitat management for dragonflies. In response to requests from RSPB, an ambitious scheme is being developed to help conserve dragonflies on RSPB reserves (see Pickess 1990). Already the RSPB's *Manual on gravel pit restoration for wildlife* (1990) contains a chapter on the management of gravel pits for dragonflies. As a result of the threat facing the Basingstoke Canal from an increase in boat traffic, DCG has given support to English Nature in the latter's proposals for zoning boat use; and Peter Miller has helped with the survey of the dragonflies on the Canal, carried out by a local group of BDS and organised by Tony Mundell in order to obtain a baseline for monitoring the effects of increased boat traffic. Mike Parr has done much to promote conservation of dragonflies in the Somerset Levels, and this work has led to BDS making a substantial gift to the RSPB towards purchasing more land so that RSPB can manage its wetland habitats more effectively for both birds and dragonflies.

At the request of the Suffolk Wildlife Trust, Norman Moore organised a study of the Norfolk Hawker, *Anaciaeschna isosceles*, at the Trust's reserve at Castle Marshes in order to advise the Trust on the management of the dykes for this rare species. BDS donated £500 to the Trust for sluices at the site.

DCG continues to support other conservation bodies when important sites (e.g. Rainham Marshes) are threatened, by giving evidence to public enquiries and, where appropriate, by contributing money towards site purchase.

BDS members are frequently asked to give advice about conservation, in particular about improving or creating habitats for dragonflies and about how to carry out monitoring programmes. Accordingly members of DCG have produced leaflets and booklets (e.g. *Code of practice on collecting dragonflies in the United Kingdom and abroad*, *Dig a pond for dragonflies*) and an article on monitoring dragonfly populations (Moore & Corbet 1990) with the aim of systematising responses to requests for information. A booklet entitled *Managing habitats for dragonflies* was published in 1993, and further publications are planned.

While habitat degradation and loss in the United Kingdom continue, the work of the DCG can be expected to increase in importance and perhaps — manpower permitting — to widen in scope. At present, DCG is contributing to the conservation of dragonflies and their habitats in a variety of ways that use the expertise of its members BDS as a whole to good effect, and that enable BDS to identify at an early stage opportunities for assisting other organisations, with advice or money, to protect or manage threatened habitats that support interesting dragonfly populations.

A project deserving inclusion in this section is the Ashton Water Dragonfly Sanctuary. Although this was conceived and made a reality outside the auspices of BDS, the Society has subsequently come to be closely associated with it, being able to help with advice, and

benefiting both directly from access to the site (as when about 40 members assembled there for a memorable visit on 21 July 1991) and indirectly from the publicity it gives to the Society and its objectives. The initiator and manager is Ruary Mackenzie Dodds. It is a coincidence, and a happy one, that the Sanctuary is situated on the Northamptonshire estate owned by the Society's first Patron (see section 6). Work at Ashton Water began in early 1989 to modify a five-acre site, containing a three-acre lake, and to protect the site from deer. The Sanctuary, which was inaugurated in 1990, is operated in order to attract dragonflies and people to the site, and to conduct research. The number of dragonfly species recorded in 1991 was 15, there having been only five species two years previously. There is a Visitors' Centre where information about dragonflies and the threats they face is displayed; and Open Days, which attracted more than 650 people in 1991, are held. One facet of the ongoing research programme has already been reported in the Society's Journal (Dodds 1992). Some of the initial protection work was supported by grants from NCC (now from English Nature) and from WWF. As more financial support becomes available, the scope of the facilities offered will increase. This project – in conception, design and implementation – has been so successful that it will serve the additional function of encouraging other conservationists to follow suit.

9 Field trips

From the beginning, Field trips, whether structured or not, have constituted a very important part of the Society's social activities. The growth and format of such meetings have reflected the growth and pattern of BDS and in particular the growth of public interest in nature conservation and changing attitudes towards wildlife. In 1983 there were just two outings – to Amberley Wildbrooks and Whixall Moss; in 1992 there were 13, attended by a total of well over 250 people. There has always been a potential conflict (when a large number of active enthusiasts visits a prime site at the same time) between habitat protection and the pleasure and excitement that participants derive from a Field trip – benefits that themselves motivate people to work for conservation. So far, through care on the part of the Fieldtrip leaders and perhaps a measure of good fortune, habitat degradation seems to have been avoided. But, especially if interest and membership grow, continued vigilance by the leaders will be needed, and a pamphlet has been prepared to offer guidance in this regard. The first summer meeting of 1992 broke all previous records for attendance, 30 cars containing some 60 members arriving to see the Club-tailed dragonfly, *Gomphus vulgatissimus*, at Pangbourne on 31 May.

During 1983-1992 inclusive, 71 different Field trips have been organised; of these 49 have been well recorded in the Newsletter, from which it can be estimated that attendance amounted to some 959 'member-days', at an average of about 20 members per meeting, the turn-out ranging from 6-40. In 40 of these outings the weather was mentioned: it was 'good' on 43% of occasions, 'fair to acceptable' on 25%, and 'atrocious' on 32%. The incidence of bad weather merely serves to underline the socially cohesive role of Field trips. David Winsland, who supplied these statistics and who largely set the pattern of Field trips during the late 1980s, writes (1992): "I have been on several trips where weather has made the finding of dragonflies extremely difficult but never have I heard a single complaint from anyone attending. It illustrates the strength of our Society. It is sufficient to meet old friends

and to make new ones, to talk of dragonflies and see new places. It is all part of the summer."

To an increasing extent Field trips are extending their scope beyond the flying season, into spring and autumn, to include forays for larvae and working projects designed to manage habitats for conservation. For example, in March 1992 an outing to the New Forest to search for larvae attracted 17 members; and a working party of seven helped to construct a walkway at Thursley Common to arrest damage caused by visitors.

10. Local Groups

With BDS firmly established nationally, the formation of Local Groups has been a timely and encouraging development (Minutes 86/5). Local Groups (listed in item 18 of Newsletter 23 of spring 1993), sometimes a direct spin-off from the Field-trip programme which is to some extent necessarily regional, have the potential to publicise dragonflies and to undertake important conservation work at the grass-roots level. The North of London Group provides an example of what can be achieved quickly by a few enthusiasts. After local members had been contacted, the Group held its first meeting in February 1991 and attracted about 20 active members. During the ensuing summer it surveyed an important local SSSI to monitor the effects of a management plan drawn up by English Nature; by following a roster, members were able to visit the site at least once a fortnight during mid-May to mid-September – a coverage that would have been impossible to achieve without the existence of a co-ordinating body. In addition to meetings, the Group has held a larval identification workshop and has secured funding from the Corporation of London for a research assistant to investigate the habitat preferences and habitat requirements of the Downy Emerald, *Cordulia aenea*. This way of focusing interest of local members on productive projects has been conspicuously successful in certain other countries (e.g. the Kansai Research Group of Odonatology based in Osaka, Japan). Effective liaison is maintained between Local Groups and Regional Recorders participating in the Odonata Recording Scheme administered by the Biological Records Centre at Monks Wood Experimental Station.

11. Office of Archivist/Librarian

The decision by the Committee in 1991 to establish, on a trial basis, this office was consistent with its wish to preserve records of the Society from an early stage in its development (witness the article commissioned from Bob Merritt, and the present one). The proposed functions of the Archivist/Librarian, at present performed by Cindy and Peter Allen, comprise (in brief) the acquisition, cataloguing and curation of material relevant to the history of the Society, and the accommodation of a modest odonatological library, including a set of SIO periodicals since 1982 and including all back numbers of the BDS Journal. The potential of this function for laying a firm foundation of archival material relating to BDS is great. Realisation of the potential will depend not only on the availability of willing incumbents but also on the interest and support shown by the membership. At present an urgent need exists for photographs, especially from the early days of the Society. After a year's trial, it has been decided to confirm and continue this Office.

Acknowledgements

I warmly thank those members of BDS who, at my request, sent me material relating to their own close involvement in the development reported here. I found this material invaluable, both for the factual information it contained and for the perspectives it offered on the Society's activities. These members are: Peter Allen, Steve Brooks, Ruary Mackenzie Dodds, Roderick Dunn, Brian Eversham, Richard Gabb, Peter Mill, Peter Miller, Norman Moore, Jill and Ronnie Silsby and David Winsland. I am also very grateful to the following members for commenting on an advanced draft of this article: Steve Brooks, Roderick Dunn, Andy McGeeney, Peter Mill, Peter Miller, Norman Moore and Jill and Ronnie Silsby.

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Table 1. Occupancy of elected and appointed positions in the British Dragonfly Society.

Position	Year ¹									
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
1 President	PC	PC	PC	PC	PC	PC	PC	PC	PC	AM
2 Vice-President	DC	DC	DC	GV	GV	GV	PLM	PLM	PLM	PLM
3 Ordinary member	* ²	ES	WN	WN	WN	RC	RC	RC	RC	WW
4 Ordinary member	*	AW	AW	DW	DW	DW	DW	ES	ES	ES
5 Ordinary member	*	SC	SC	SC	RK	RK	RK	RK	SGB	SGB
6 Ordinary member	*	*	*	*	*	*	PA	PA	PA	PA
7 Secretary	RM	RD	RD	RD	JS	JS	JS	JS	JS	JS
8 Treasurer	RD	BB	BB	RG	RG	RG	RS	RS	RS	RS
9 Editor	RM	SJB	SJB	SJB	SJB	SJB	SJB	SJB	SJB	DT
10 ORS Organiser	RM	RM	RM	RM	*	*	*	*	*	*
11 SIO Representative	PJM	PJM	PJM	PJM	PJM	PJM	PJM	PJM	PJM	*
12 DCG Convenor	*	*	*	NM ³	NM	NM	NM	NM	NM	NM
13 Field-trips Co-ordinator	RD	RD	RD	RD	DW	DW	DW	PA	PA	PA
14 IM Programme Organiser *		RD	RD	RD	GV	GV	GV	PLM	PLM	PLM
15 IM Local Arrangement Organiser *		RD	PJM	PLM	PJM	PLM	PJM	PLM	PJM	PLM
16 Publicity Officer	*	*	*	JS	JS	JS	JS	JS	JS	JS
17 Local Groups Co-ordinator *	*	*	*	*	*	RC	RC	RC	RC	WW
18 Fund-raising Officer	*	*	*	JS	JS	JS	JS	JS	RMD	JS
19 Archivist/Librarian	*	*	*	*	*	*	*	*	CA/PA	CA/PA
20 Legislation Officer	*	*	*	*	*	*	*	*	*	PJM
21 SIO Representative	*	*	*	*	*	*	*	*	*	JS
22 Honorary members	*	*	*	*	*	CL	CL NM	CL NM	CL NM	NM PC MR
23 Patron	*	*	*	*	*	*	*	*	*	MR

¹ If the incumbent changed during a calendar year, the entry refers to the year of election or appointment.

² An asterisk denotes that the position did not exist at the time.

³ Although, by decision of the Committee, a DCG Convenor was first appointed on 19 October 1986, relevant changes to the By-Laws were not made until 1988.

Notes:

- Positions 1-12 comprise the Committee (or Board of Trustees), 1-6 being elected and 7-12 being appointed. Position 11 (later 21) ceased to be part of the Committee in 1991.

- Positions 1 and 2 are equivalent to Chairman and Vice-Chairman of the Board of Trustees.

- The liaison function of position 10 was achieved from 1988 onwards by inviting the ORS Organiser at the BRC (B. Eversham) to attend Committee meetings as an observer.

- For membership of DCG see text.

- Abbreviations: AM, A.McGeeney; AW, A.R. Welstead; BB, B.Bailey; BRC, Biological Records Centre of the Institute of Terrestrial Ecology; CA, C.A.Allen; CL, C.E.Longfield; DC, D.B.Chelmick; DCG, Dragonfly Conservation Group; DT, D.A.Tagg; DW, D.C.Winsland; ES, E.M.Smith; GV, G.S. Vick; IM, Indoor meetings; JS, J. Silsby; MR, M.L. Rothschild; NM, N.W. Moore; ORS, Odonate Recording Scheme; PA, P.M. Allen; PC, P.S. Corbet; PJM, P.J. Mill; PLM, P.L. Miller; RC, J.R. Cox; RD, R.H. Dunn; RG, R.Gabb; RK, R.G.K. Kemp; RM, R.Merritt; RMD, R. Mackenzie Dodds; RS, R.I. Silsby; SC, S.Coker; SGB, S.G. Butler; SIO, International Odonatological Society; SJB, S.J.Brooks; WN, W.Nelson; WW, W.H. Wain.

Table 2. Membership of the British Dragonfly Society.

Year ²	Category of membership ¹						Totals
	Ordinary	Library	Life	Honorary	Corporate	Associate	
1984	327	-	-	-	-	-	327
1985	347	-	-	-	-	-	347
1986	>350	-	-	-	-	-	>350
1987	363	-	-	-	-	-	363
1988	434	2	47	1	-	-	484
1989	452	12	74	2	-	-	540
1990	524	14	100	2	-	-	640
1991	587	15	111	3	-	-	716
1992	746	15	148	2	5	1	917
1993	913	15	164	2	8	4	1106

¹ Excluding Reciprocal membership, the only unofficial category.

² Entries refer to the number of members in good financial standing on 1 April.

Table 3. Changes in the financial position of the British Dragonfly Society.

	1987/1988	1991/1992
Annual income (£)	2,400	13,500 ¹
Annual expenditure	2,000	9,000
Total assets	1,340	14,000 ²

¹ Excluding Life-membership subscriptions, this amount is £11,500.

² Of this amount £8,200 comprises accumulated Life-membership subscriptions.

Further observations on generation time and maturation of *Ichnura pumilio* with notes on the use of a mark-recapture programme

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Introduction

In recent years *I. pumilio* has undergone an easterly expansion of its range in the British Isles, away from its traditional distribution in south and west England and south Wales. Despite heightened awareness of the species little is known about life expectancy and adult maturation. Corbet *et al.* (1960) suggested a two-year life-cycle, whereas Fox and Jones (1991) report a possible one - year development. Both males and females of *I. pumilio* go through age-related colour changes (Cham, 1990) but the time scale of these changes is unknown. At Sundon Springs chalk quarry in Bedfordshire a study including mark-recapture has been made to investigate generation time and maturation.

Methods

Generation time

In order to establish the generation time of *I. pumilio*, several new flushes were created during August 1992 and one 'seeded' with stems of *Juncus articulatus* into which females had been observed ovipositing. The habitat conditions of a spring-fed seepage zone can easily be manipulated to create new flushes and runnels. Adults emerging from these new runnels in 1993 could only arise from these eggs or eggs from additional oviposition during 1992. The new runnels were sited so that immigration of larvae from other existing runnels was extremely unlikely. Only the middle of three runnels had stems with eggs added so that any possible movement of larvae between them could be monitored.

Maturation

During the adult flight period of 1992 over 600 individuals were uniquely marked on the wings with permanent marker-pens (Staedtler Lumocolor type 313) using a system of dots and dashes (Hinneking, 1974). Due to the numbers of individuals marked, six different colours were used to give a greater number of permutations. As many individuals as possible were marked on each visit to the study site. Special care was taken when marking teneral individuals so as not to damage the wings. Similarly, all observed individuals were inspected for markings and details recorded. In order to determine age-related colour changes individuals were assigned to the following classes.

Females

- i) Teneral: individuals observed emerging or with milky wings.
- ii) *Aurantiaca*: immature females with overall orange coloration and clear wings.
- iii) Intermediate: females showing transitional colour between *aurantiaca* and mature coloration.

- iv) Typical: females showing the green/brown coloration typical of mature individuals.
- v) Typo: mature females showing signs of oviposition (chalky deposit on wings or abdomen as reported by Cham (1990).
- vi) Typovip: mature females observed in the process of ovipositing.

Males

- i) Teneral: individuals observed emerging or with milky wings and with brown tail (segments 8 and 9 brown).
- ii) Faint blue tail: maturing individuals with segment 8 and 9 faint blue or intermediate between brown and blue.
- iii) Mature: individuals exhibiting a distinct blue on segments 8 and 9. It was discovered part way through the study that this age class could be further subdivided. Maturing males undergo a change in ground colour of the thorax from green through to turquoise and then to blue, similar to that exhibited by *I. elegans* (Parr, 1973).

Results

The seeded seepages were searched during March and April 1993 and developing larvae were found on each visit. During May some larvae were found to be in the penultimate instar and by 5th June some had reached final instar. Bad weather at the beginning of June disrupted emergence across the site with some individuals emerging from other seepages. On 28th June four individuals emerged from the "seeded" seepage followed by five further individuals on subsequent days. Confirmation for a one-year generation time was further supported by individuals emerging during June 1993 from a shallow pool which did not exist during the 1991 flight period.

During the 1992 adult flight period 628 individuals were marked, of which 30.4% were recaptured at least once on subsequent visits. Adults were first observed at the site as tenerals on the 3rd June and sightings continued throughout the summer until the last individual disappeared on 23rd August. Figure 1 illustrates the total numbers of both sexes marked and recaptured throughout the flight period. There is a noticeable peak during the last week of June. Figures 2 and 3 show numbers of males and females according to age class over the same period.

Discussion and observations

Maturation time and colour change

Females (Fig.3)

In order to establish time points for age-related colour changes it was important to recapture individuals marked as tenerals at the time of transition between the immature *aurantiaca* form and the green/brown mature form. During the study, 24 females were recaptured at various time points which allowed the duration of the maturation process to be determined (Table 1). There appeared to be some degree of variation in the various stages which may be attributed to weather conditions and the availability of food.

Table 1. Time period of female maturation

Teneral-><-----	Aurantiaca-----	<-----Intermediate-><-----	Mature->>>
1 DAY	5-9 DAYS	2 DAYS	up to 26 DAYS

These observations are similar to those of a recent study in the Camargue in Southern France in which females kept in outdoor cages transformed in colour from the *aurantiaca* phase in between 6 and 12 days, under suboptimal weather conditions (Langenbach, in prep).

There has been some discussion as to the state of maturity of the *aurantiaca* phase (Kyle, 1961; Winsland, 1984; Cham, 1990). From observations made during this study it would appear that some *aurantiaca* females are receptive to tandem formation and will form a copulatory wheel. However, *aurantiaca* females observed in association with males exhibited early signs of colour transformation. In the early stages, *aurantiaca* females repel all advances from males involving vigorous attempts to escape from persistent males. Two *aurantiaca* females which were observed 'in-cop' were caught and retained in captivity in June 1993, both had transformed to green within two days. *Aurantiaca* females when dissected or sectioned do not contain fertile eggs (Kyle, 1961; Zimmermann, 1973) but it is not known however, whether they can store sperm until the eggs have matured.

Females exhibiting mature colouration appear to have regular matings, several individuals were observed 'in-cop' with up to three different males during one day as well as being seen 'in-cop' on subsequent days.

Males

Age determination in males proved more difficult to determine. Teneral males have a brown 'tail' which appears to last less than 48 hours before developing signs of blue. The thorax is distinctly green in maturing males (see photograph p.32 of McGeeney, 1986) and gradually develops through turquoise to deep blue (see photograph p.69 of Gibbons, 1986). More detailed age determination could be achieved by using colour reference charts but this was out of the scope of this study. Blue-tailed males of all colour phases were observed 'in-cop', suggesting that they mature more rapidly than females. Such is the case in *Ischnura elegans* (Parr, 1973).

Dispersal

Individuals spend a lot of time resting on vegetation or flying over the seepage area. However, on very warm, sunny days with little or no cloud cover, individuals of all age classes and sex were observed flying vertically upwards in a very direct and positive manner, similar to that described by Fox (1989). Upward flight continued until they were lost from sight, presumably then to be carried along by prevailing winds. The stimulus for this dispersal flight may either be clear blue skies (visual stimulus) or the formation of thermals rising up from the ground (physical or temperature stimulus). Such behaviour was not observed on dull or overcast days.

Males were also observed on three occasions to change from typical fluttering flight to a very direct flight along water filled runnels. These individuals would fly in a strong, positive manner following the course of seepages. One individual was observed flying in this manner for nearly 150 metres. This may also be a form of dispersal flight, perhaps in search of females or new habitat, one male was seen to stop on encountering a female.

Mortality

Both marked and unmarked individuals were found dead during the study. Some were taken by various species of spider, both web-forming and hunting spiders. Others however, appeared to succumb to periods of heavy rain where they were knocked out of vegetation to become waterlogged on the water surface from which they were unable to get free.

During the pre-emergence/emergence period, surface-dwelling spiders (species unknown) were observed preying on larvae. These were taken either during the period prior to emergence or as the larvae leave the water to emerge. Under the shallow water conditions larvae could be particularly vulnerable when active.

Limitations of mark-recapture

A mark-recapture programme is an adventurous undertaking and requires considerable investment of time over the adult flight period. This is a commitment that many amateur naturalists would find difficult to make. The number of individuals encountered was influenced by the amount of time spent at the study site during each visit. Visual estimates or 'Pollard Walk' type estimates (Jenkins, 1986) were found to lead to significant underestimates of numbers. Time spent at one spot using mark-recapture demonstrated considerable movement of individuals within the seepage area during a relatively short time period. On one visit only 6 individuals were observed using the Pollard Walk approach whereas mark-recapture revealed more than 40 individuals in the same area less than an hour later.

The marking techniques employed have some limitations. Several types of symbol were used in order to establish the best method. The use of letters and numbers can give rise to confusion. As ink dries on the wings some degree of shrinkage occurs, the letter B for example could be mistaken for 8 and vice versa. The ink markings also 'weather' and can be lost altogether, making interpretation difficult in some cases. Some of the multi-pigment colours such as black appeared to suffer from differential loss of pigment, leading to change of colour. One individual's markings (that could be cross checked) had changed from black to red! The dot-dash system had the least drawbacks and was adopted as the method of choice. By numbering sequentially as individuals were captured, back-checking could be readily performed with regards to sex, age class and marking colour. Marking did not appear to affect the behaviour or viability of individuals as on numerous occasions freshly marked individuals were observed back on the seepages resuming sexual behaviour within minutes of being marked and released.

Emergence of adults has a distinct peak during the early part of the flight period which then tails off through the summer. When numbers were at their peak it was difficult for one person to mark all the individuals encountered and therefore many went unmarked at this time. The peak numbers shown in figures 1-3 would therefore represent an underestimate of the true numbers. At other times, numbers were manageable for one person. For these reasons, in-depth statistical analysis of the recapture data would be of little value.

Despite these limitations, mark-recapture at the amateur level is a useful tool and can provide valuable information that would be almost impossible to obtain by casual observation. Brooks (1993) reported on the benefits of group co-operation in the study of adult dragonfly populations and this could equally apply to the use of mark-recapture.

TOTAL POPULATION 1992

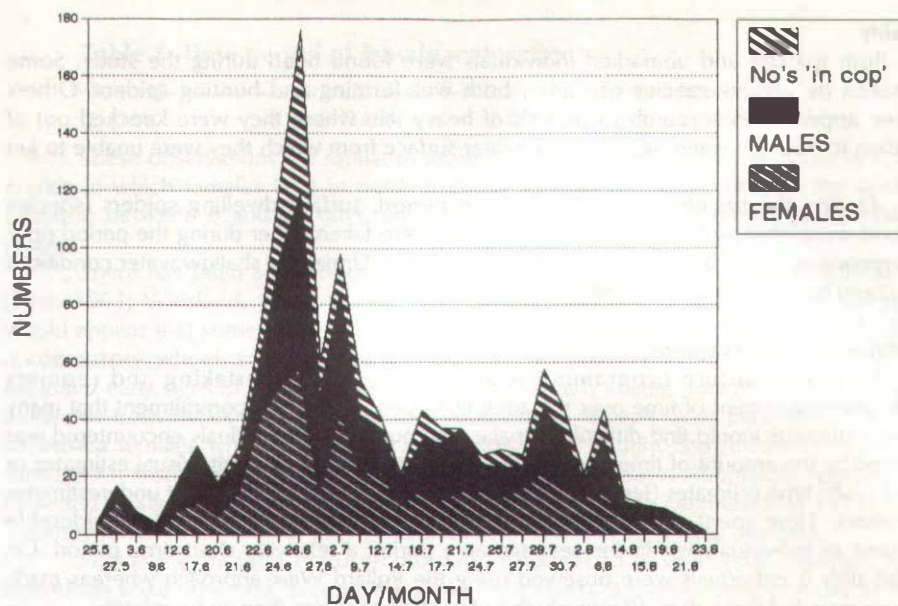


Figure 1

Males : Sundon 1992

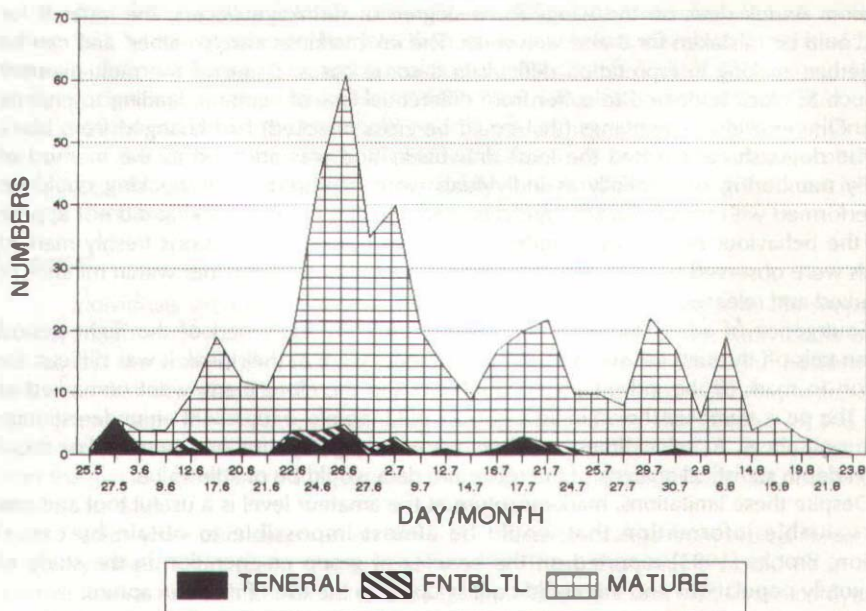


Figure 2

Females : Sundon 1992

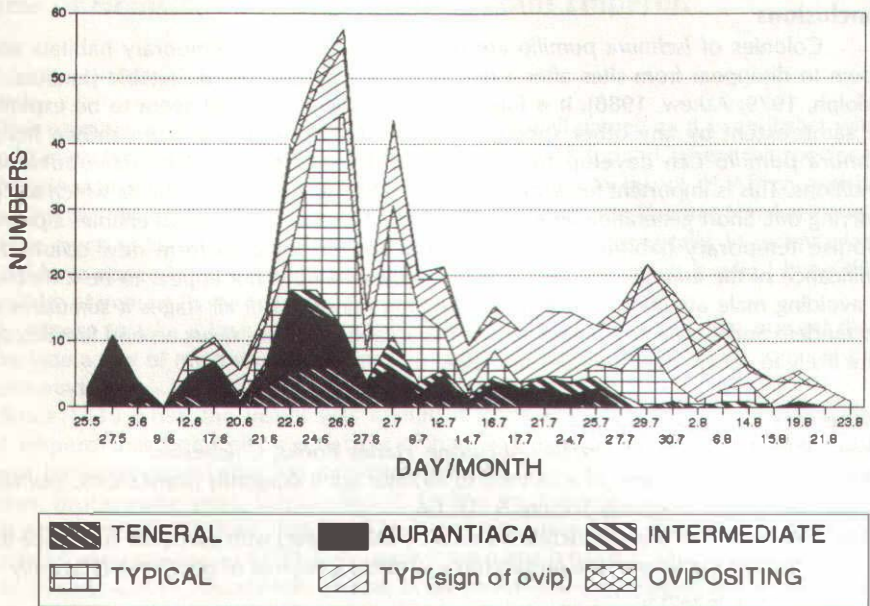


Figure 3

Conclusions

Colonies of *Ischnura pumilio* are widely reported from temporary habitats and are known to disappear from sites after a few years as they become unsuitable (Jurzitza, 1970; Rudolph, 1979; Askew, 1988). It is found in habitats which do not seem to be exploited to the same extent by any other species of British Odonata. It has been shown here that *Ischnura pumilio* can develop from egg to adult in less than one year under natural conditions. This is important for a species which inhabits temporary habitats which are prone to drying out. Short generation time combined with its mode of dispersal enables *I. pumilio* to colonise temporary habitats, develop rapidly and disperse to form new colonies. The significance of the *aurantiaca* phase is as yet unclear. It does not appear to be a mechanism for avoiding male attention during the maturation period, as at all stages it stimulates males into tandem and copulatory behaviour. As the *aurantiaca* phase nears an end females appear more likely to accept the attentions of males.

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A review of *Hemianax ephippiger*, the Vagrant Emperor.

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This member of the Hawker family (Aeshnidae) is well named as it is an insect with very strong migratory instincts: it has even been known to reach Iceland, where the species is the only odonate ever to have been recorded! Essentially an insect of Africa and its neighbouring islands, of the Middle East and of south-west Asia, the Vagrant Hawker travels widely over much of Europe where, in southern parts, it breeds sporadically. In recent years individuals have appeared in various parts of the United Kingdom which is why I hope this review will be of interest to our readers.

I propose to take a look at some of the literature, from 1839 up to the present day, and to include a few of my own observations, in corroboration or otherwise, of some of the statements made.

Since 1839 when the insect was named *Æschna ephippigera* by Burmeister, the Vagrant Emperor has been given a variety of names and, indeed, typifies the constant movement between genera that has occurred, and still does occur, in the classification of dragonflies. In the same year, Selys called it *Æschna mediterranea* and, in 1842, Rambur named it *Anax senegalensis*. After that, in 1871, it was placed by Selys in a (now non-existent) genus called *Cyrtosoma* and, in 1890, Kirby gave it the name it bears today.

In 1936 Lt.-Col F.C. Fraser tells us that, in the Indian sub-continent, *Hemianax* "is more or less confined to the dry zones of N.W. Provinces and the Deccan", that "it breeds in still waters such as marshes and shallow weedy tanks" [small lakes] and that "its habits agree closely with those of *Anax parthenope*." The last statement is one with which I disagree. In Saudi Arabia and in southern parts of Europe, both species occur and, although *Hemianax* is smaller, the two are superficially very alike, particularly in colour; the wings of both can have a distinctly yellowish tinge and both have brownish abdomens with a blue patch near the base. They do share one habit, in that the female of both species egg-lays while in tandem with her mate but, nevertheless, it is their very different behaviour patterns that make identification possible from a distance: a single ♂ *A.parthenope* (Lesser Emperor) will patrol a small section of a piece of clear water, flying constantly up and down in typical Emperor fashion and strenuously seeing off intruders; *Hemianax*, on the other hand, generally congregate in considerable numbers, flying low over well-vegetated ponds, and show no signs of territoriality whatsoever.

The Vagrant Emperor breeds throughout Africa and its neighbouring islands and, according to Pinhey (1951), in southern Africa "it is common and widespread in the warmer areas from November to about February. It favours small streams and, unlike the *Anax* species, which are solitary hawkers over short beats, *ephippiger* may be seen in numbers over a small pool and several pairs may be seen flying in tandem at the same time. They usually fly very low. The ♀ oviposits in rather stagnant water, resting on a twig and bending her abdomen down in the water." Most of these remarks tally with my own observations. On several occasions in January 1989, I observed ♂ Vagrant Emperors congregating at two of the lagoons belonging to the sewage plant of a small town near Durban (Natal). They started to arrive at about 9.30 a.m. and for two and a half hours engaged in ceaseless movement, showing no sign of territorial behaviour. On the approach of a female, one of the males

would take her in tandem and the pair would disappear into the long grass or over the hedge into a neighbouring garden where a fairly brief copulation took place. The pair would then return to the lagoon and, still in tandem, the female would lay her eggs into the stems of the floating vegetation on which they settled. Each day, by soon after 12 noon, all the Vagrant Emperors had disappeared from the lagoons and, as we discovered more or less by chance, many had flown off to a sizeable stand of mixed trees a couple of kilometres away. Here they flew in and out of the trees, hunting and catching the quantities of smaller insects that were swarming around the perimeter of the wooded area.

A year later, in early February, I observed totally different oviposition behaviour at a wide, shallow portion of a heavily reeded stream, close to a built-up area outside Johannesburg (Transvaal). There was very little floating vegetation and females, generally in tandem but sometimes alone, laid their eggs into the stems of reeds, at between 9 and 12 inches above the water level. This method is totally at variance with all reports I have read and with my own previous observations. Could I have been mistaken as to their identity? Lack of thigh-boots together with the threat of bilharzia in the area, precluded closer examination but I think not. *Anax parthenope* (which in any case does not oviposit in this manner) has not been recorded from southern Africa and I know of no other aeshnid with markings that are in any way similar.

In his book on the Odonata of eastern Africa (1961) Pinhey discusses the crepuscular habits of *Hemianax* and, quoting from Van Someren's notes, he writes: "May 11th, 1950, Kangole, Karamoja, Uganda.... at about 5.30 several large dragonflies noted flying around and by 6.30 thousands filled the air and settled on bushes and low trees.... thousands of (*H.*) *ephippiger* were present. The dragonflies were noted as 'roosting' on twigs and foliage at 10 p.m. By 6 a.m. next morning all the dragonflies had gone."

Many authors have commented on how *Hemianax* is attracted to lights after dusk and I witnessed this in Luxor (Egypt) in November 1987. Each evening we returned to our hotel on Crocodile Island as dusk was approaching. We made our way through the garden at the back of the hotel, along a winding lamp-lit path, at the commencement of which was a thick clump of tall bamboos. From this emerged clouds of *Hemianax* which were clearly setting out to enjoy their evening constitutional. They flew high up into the air and down again, zig-zagged in all directions and, round each of the lamps, groups of twenty or more congregated to perform aerial ballets. We were always tired after a long day and anxious to get ourselves into a bath and then relax with a drink before dinner and so were never able to say how long the hectic evening flights lasted. *Anax parthenope*, incidentally, were also around; they tended to be attracted to the much brighter lights at the front of the hotel and it was noticeable that, whilst they flew around in twos and threes, *Hemianax* were in dozens.

When describing the habitat of *H. ephippiger*, J - L. Dommanget et al. (1985) tell us that breeding in Europe was confirmed by "the discovery of larvae living in temporary aquatic environments in southern France some years ago." R.R. Askew (1988) informs us that larvae "have recently been found in the south of France, central Italy and Sicily" and that teneral adults have been captured in the Camargue.

Dommanget also writes that "adults have been observed far from their breeding places, on long migratory flights" and that "adults seen in northern Europe from April to October are invariably migrants from their countries of origin." Those that actually breed in southern Europe, emerge in May and June. The authors also describe very rapid larval development "enabling the species to develop in waters that dry up later in the season." R.M.

Gambles (1960) tells us that larval development may be as short as 90 days. According to P.L. Miller (1987), females (still in tandem) have been known to climb down into hoofprints made in mud where they oviposit into the damp soil. This facility is of great importance as far as the species' continued existence in arid parts of the world is concerned. Whether the same rapid larval development takes place in less critical parts of their range, is not certain. H.J. Dumont & K. Kesmet (1990) discuss the short larval period enjoyed by *Hemianax* in arid tropical areas and surmise that individuals that become established in cooler Mediterranean areas, probably revert to the more usual (among odonates) 'long type' of larval development. They refer to a very interesting observation from A. Maibach et al: "... the spring immigrants to Switzerland of 1989 successfully produced a second generation, emerging in August. These founding propagules thus maintained the 'short type' of larval reproduction, no doubt because of the hot summer conditions of 1989. The fate of this second generation (successful oviposition; larval survival?) is not known." In no part of southern Africa have I, personally, witnessed oviposition in anything but what appeared to be permanent water. I concede, however, that Africa is always susceptible to drought. An investigation into the length of the larval stages in these southern African Vagrant Emperors would be very interesting. Askew, on the same subject, tells us that *Hemianax* "breeds in small, standing water bodies, sometimes of a temporary nature and sometimes brackish." He also writes that this strongly migratory species "may turn up almost anywhere, although it seems to avoid woodland." I don't think I totally agree with this final remark - witness my observations in Natal above.

Henry J. Dumont (1991) tells of mass migrations recorded in Egypt in 1925 and 1926 and also reports that large swarms have been observed in "absolute desert country." I can, to some extent, confirm this. In October 1986, we were in the desert south of El Alamein (Qatara Depression of World War II renown) and there was no water for miles around us. On returning to our vehicle we found a male *Hemianax ephippiger* settled on the roof (sadly there was no close-up lens to hand as dragonflies were the last things we expected to see on that particular outing).

Finally, in January of this year, I was sent the Abstract of Papers read at the Fourth South Asian Symposium of Odonatology held at Allahabad, India in October 1992. One of the papers, presented by BDS member Vinod Srivastava (et al.), was entitled "Experimental evidence on the role of odonate larvae in biological control of mosquitoes". It was a snippet at the end of the abstract that intrigued me: "*Hemianax ephippiger* emerged as the best predator, even better than the fish *Gambusia* and the beetle *Dysticus*." Dr Srivastava has promised to send me a copy of the paper when it is ready.

To finish this review of the Vagrant Emperor let us look at its recorded appearances in the British Isles. Cynthia Longfield (1960) mentions one ♀ captured in **February 1903** in Devonport by J.H. Keys, and another captured in **October 1913** in Dublin by A. Douglas. She suggests that both may have arrived as a result of assisted passages "on ships from the Far East."

In **October 1968**, Allen Davies' son picked one up from the pavement in the centre of Royal Tunbridge Wells. (Merritt, 1985)

In **1970**, R. Tulloch was handed a specimen that had flown into a hayrick on the island of Fellar in the Shetland Islands. (Merritt, 1985)

On **28 October 1971**, at Hunslet in Yorkshire, J.H. Flint was given a male by the driver of a lorry on which it had settled. (Merritt, 1985)

During the 1980s and '90s records (some with photographs) have proliferated:

11 August 1983 (photographed). A female at Portland Bill, Dorset (N. Rogers).

18 July 1984 (photographed). I was fortunate to be in the company of Noelle and Tony Welstead on the occasion when we were shown the newly-dead corpse of a male Vagrant Emperor. It had died after being caught in the windscreen-wiper of a passing car, which was travelling along the eastern boundary of the New Forest.

31 October 1988. P. Waterton found a male, still alive, in an oil/water separator in the middle of a chemical factory at Wilton in Cleveland.

8 November 1988. Martin Catt found one at East Prawle, near Salcombe in Devon.

9 November 1988. I. Berry recorded one at Mount Edgcumbe Country Park, Cremyll, East Cornwall.

2 July 1990 (photographed). A male, perched on long grass at Old Bursledon, near Southampton (John Horne).

18 July 1991. A male was observed patrolling the margins of a St. Ives gravel pit.

8 January 1992. A male was found alive on a footpath in Mount Gould Park in Plymouth. It died the next day and was sent to the Natural History Museum in London.

It would seem that these various individuals arrived from very different parts of the world. Taking the species' known flight periods into consideration, those arriving between April and October are likely to have originated in the northern hemisphere, but those recorded here between November and February must surely have travelled from south of the Equator.

With a body length of just under 2.5 inches, it is such a tiny creature and, in order to reach us, it must have flown such a very long way!

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Brief notes and observations

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For several reasons this section is being completed earlier than usual which means it is shorter than usual. Thanks as always to those who have sent records in.

For the next issue could I please have all contributions by January 10th 1994.

Range expansion/Migration

Following the series of sightings of Red-veined Darter (*Sympetrum fonscolombei*) in 1992 we have now been advised of another, in Hertfordshire, on May 22nd. (C)

News was also received of several at Porthgwarra, Cornwall, for a few days around July 8th 1993, so perhaps this year may be another good one for this species.

A Hairy Dragonfly (*Brachytron pratense*) seen at Spruce Hill Pond, Crawley, Sussex on June 4th 1993 was apparently the first for the 10km square TQ23 since 1980. (A)

Unusual markings

A female Blue-tailed Damselfly (*Ischnura elegans*) of 'brown type' [presumably either *infuscans* or *infuscans-obsolata*] seen at Ifield Mill, Sussex on June 27th 1993, had white at the base of the wings which extended approx. $7/16$ in., looking 'much like paint'.

Predation

At Sidlow, Surrey on June 27th 1993 an Emperor (*Anax imperator*) was seen to consume a female Banded Demoiselle (*Calopteryx splendens*). (A)

Dates

A female Hairy Dragonfly (*Brachytron pratense*) ovipositing at Houghton, Sussex, on June 30th 1993, is a fairly late date. (A)

Some additional first and last dates for 1992 have been received, and the following make interesting comparisons with those published in the last Journal:

First dates:

Migrant Hawker (<i>Aeshna mixta</i>)	July 18	Hilfield Park Res., Herts.	(C)
Ruddy Darter (<i>Sympetrum sanguineum</i>)	June 28	Stanwell, Middlesex	(C)

Last dates:

Common Blue Damselfly (<i>Enallagma cyathigera</i>)	Sept 26	Hilfield Park Res.	(C)
Brown Hawker (<i>Aeshna grandis</i>)	Oct 5	Elstree, Herts.	(C)

Only a few first dates have been received so far for 1993.

Large Red Damselfly (<i>Pyrrhosoma nymphula</i>)	April 14	nr St. Buryan, Cornwall	(B)
	April 27	Elstree	(C)
Broad-bodied Chaser (<i>Libellula depressa</i>)	May 7	Hilfield Park Res	(C)
	May 8	Rusper, Sussex.	(A)
Emperor (<i>Anax imperator</i>)	June 1	Elstree	(C)
	June 1	nr Faygate, Sussex.	(A)
Common Darter (<i>Sympetrum striolatum</i>)	June 2	Elstree	(C)

Observers

- (A) J. Havers, 53 Cuckmere Crescent, Gossops Green, Sussex RH11 8DJ
- (B) P. Miller, 68 Blenheim Drive, Oxford OX2 8DQ
- (C) S. Murray, 184 Thirsk Road, Borehamwood, Hertfordshire WD6 5BD

Additional notes of interest. (All 1993)

Large Red Damselfly (*Pyrrhosoma nymphula*.)

Noted at Thursley Common on April 20.

Hairy Dragonfly (*Brachytron pratense*) emerging in some numbers at Ash on the Basingstoke Canal on May 1. Both noted by D. and J. Dell.

The following observations are the editor's own:

Downy Emerald (*Cordulia aenea*.) Two fresh exuviae at Esher on May 4.

Club-tailed Dragonfly (*Gomphus vulgatissimus*)

On June 8 a female of this species was observed for nearly half an hour perching on and flying around trees near an overgrown stream on Whitmoor Common near Guildford. This seems to be the first-ever sighting for this species in this part of Surrey and as far as is known this dragonfly does not breed in the county.

A number of mistakes and some omissions appeared in Vol. 9 No.1 of the Journal. Errors of this sort are very much regretted and will not happen again. The Editor would particularly ask contributors to consult either the present issue or an issue previous to Vol. 9 No.1 when following the "Instructions to Authors".

INSTRUCTIONS TO AUTHORS

Authors are asked to study these instructions with care and to prepare their manuscripts accordingly, in order to avoid unnecessary delay in the editing of their manuscripts.

Manuscripts should be typewritten using black ribbon, double-spaced, on one side of the page only and with margins at least 25 mm at the left, top and bottom; text pages should be numbered. Footnotes should be avoided.

Words that are to appear in italics (e.g. names of genera and species, though not of families) should be underlined.

Use of these terms is acceptable: 'exuvia' for cast skin (plural 'exuviae'); 'larva' (instead of 'naiad' or 'nymph'); 'prolarva' to designate the first larval instar.

References cited in the text should be in the form '(Longfield, 1949)' or '...as noted by Longfield (1949)'. All references cited in the text (and only these) should be listed alphabetically at the end of the article in this form:

Hammond, C.O. 1983. *The dragonflies of Great Britain and Ireland*. 2nd edition (revised by R. Merritt).

Harley Books, Colchester. 116 pp.

Longfield, C. 1949. The dragonflies of the London area. *The London Naturalist* 2B: 90-98.

The titles of journals should be written out in full.

Tables should be typed, each on a separate, unnumbered page.

Legends for illustrations should be typed together in sequence on a single unnumbered page.

Illustrations (figures) should be prepared in black ink, and scaled to allow a reduction of 1.5 to 3 times. Lettering should be neat and uniform.

The legend for each table and illustration should allow its contents to be understood fully without reference to the text. The approximate position of each table and figure should be indicated in the text.

LATIN AND ENGLISH NAMES OF BRITISH ODONATA

ZYGOPTERA

Calopteryx virgo
Calopteryx splendens
Lestes sponsa
Lestes dryas
Platycnemis pennipes
Pyrrhosoma nymphula
Erythromma najas
Coenagrion mercuriale
Coenagrion scitulum
Coenagrion hastulatum
Coenagrion lunulatum
Coenagrion armatum
Coenagrion puella
Coenagrion pulchellum
Enallagma cyathigerum
Ischnura pumilio
Ischnura elegans
Ceragrion tenellum

DAMSELFLIES

Beautiful Demoiselle
Banded Demoiselle
Emerald Damselfly
Scarce Emerald Damselfly
White-legged Damselfly
Large Red Damselfly
Red-eyed Damselfly
Southern Damselfly
Dainty Damselfly
Northern Damselfly
Irish Damselfly
Norfolk Damselfly
Azure Damselfly
Variable Damselfly
Common Blue Damselfly
Scarce Blue-tailed Damselfly
Blue-tailed Damselfly
Small Red Damselfly

ANISOPTERA

Aeshna caerulea
Aeshna juncea
Aeshna mixta
Aeshna cyanea
Aeshna grandis
Anaciaeschna isosceles
Anax imperator
Hemianax ephippiger
Brachytriton pratense
Gomphus vulgatissimus
Cordulegaster boltonii
Cordulia aenea
Somatochlora metallica
Somatochlora arctica
Oxygastra curtisii
Libellula quadrimaculata
Libellula fulva
Libellula depressa
Orthetrum cancellatum
Orthetrum coerulescens
Sympetrum striolatum
Sympetrum nigrescens
Sympetrum fonscolombei
Sympetrum flaveolum
Sympetrum sanguineum
Sympetrum danae
Leucorrhinia dubia

DRAGONFLIES

Azure Hawker
Common Hawker
Migrant Hawker
Southern Hawker
Brown Hawker
Norfolk Hawker
Emperor Dragonfly
Vagrant Emperor Dragonfly
Hairy Dragonfly
Club-tailed Dragonfly
Golden-ringed Dragonfly
Downy Emerald
Brilliant Emerald
Northern Emerald
Orange-spotted Emerald
Four-spotted Chaser
Scarce Chaser
Broad-bodied Chaser
Black-tailed Skimmer
Keeled Skimmer
Common Darter
Highland Darter
Red-veined Darter
Yellow-winged Darter
Ruddy Darter
Black Darter
White-faced Darter

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