

ODONATOLOGICAL ABSTRACTS

1974

- (6541) HERRERA, C.M. & A. RAMIREZ, 1974. Food of Bee-eaters in southern Spain. *Br. Birds* 67(4): 158-164. — (First Author: Estac. Biol. de Donana, Paraguay 1, Sevilla, Spain). Pellets of *Merops apiaster*, collected at 3 nesting colonies in Western Andalusia, contained 0.5-8.8% of not further identified Odon.

1979

- (6542) SCHMIDT, G., 1979. *Präparieren von Insekten und anderen Wirbellosen. Eine kurze Einführung für die Sammler*. Philler, Minden (Lehrmeister-Bücherei Nr. 104). 134 pp. — ISBN 3-7907-0104-1. — Price DM 8.-. Reprint edition of the work listed in *OA* 2767.

1981

- (6543) DYER, M. & A. DEMETER, 1981. Notes on the provisioning rates of Bee-eaters (*Merops apiaster*) in North-east Hungary. *Aquila* 88: 87-89. — (First Author: Dept Zool., Univ. Aberdeen, Aberdeen, AB9 2TN, Scotland, UK). *Aeshna* spp. were represented in the diet of a population on the Szamos R., adjacent to the Hungary-USSR border.

1982

- (6544) FURTADO, J.I. & S. MORI, [Eds], 1982. *Tasek Bera. The ecology of a freshwater swamp*. Junk, The Hague-Boston-London. VIII+413 pp. (Monographiae biologicae, Vol. 47). ISBN 90-6193-100-2.

The monograph is based on the research carried out during 4 yrs by a team of 4 Malaysian and 14 Japanese workers. Tasek Bera is an alluvial peat swamp (surface 61.5 km²) in the SW of Panhang State, peninsular Malaysia. The text is organised into 8 chapters (papers), authored by different members of the team. For the Odon. cf. *OA* 6545.

- (6545) MIZUNO, T., R.P. LIM & J.I. FURTADO, 1982. [Tasek Bera. The ecology of a freshwater swamp]: Secondary production. *In*: J.I. Furtado & S. Mori, [Eds], Tasek Bera, pp. 279-319. Junk, The Hague-Boston-London. ISBN 90-6193-100-2.

For description of the monograph cf. *OA* 6544. The Odon. were worked out by J.I. Furtado. 33 spp. are listed, and data are presented on their biomass and standing crop fluctuations. Larvae formed the third-most important component of the macrofauna. Their abundance during the dry season is probably due to their congregation in the favourable *Utricularia* habitat, to their higher reproduction rates during this period and to the abundance of food organisms. The adults rarely occur in the mats, possibly because they migrate closer to the shore and the emergent vegetation.

1984

- (6546) MARTINEZ, C., 1984. Notes sur l'alimentation du guépier (*Merops apiaster* L.) dans une colonie du centre de l'Espagne. *Alauda* 52(1): 45-50. (With Span. & Engl. s's). — (Unidad Zool. Aplic., Depto Ecol., C.R.I.D.A., 06 I.N.I.A., Carretera de la Coruna, Km. 7,

Madrid-35, Spain).

In the pellets of 100 individuals from central Spain, Odon. constituted 0.53% of the undigested food. 4 spp. and 1 genus are identified and listed.

1985

- (6547) BAUMANN, R.W., 1985. In memoriam Dirk Cornelis Geijskes (1907-1985). *Perla 7*: 3. — (Author's address not stated).

The obituary presents a good biographic outline, with emphasis on Dr Geijskes's Plecoptera work.

- (6548) KAISER, M., 1985. Natürliche Lebensräume im Kanton St. Gallen. In: S. Bucher, [Ed.], *Der Kanton St. Gallen: Landschaft, Gemeinschaft, Heimat*, pp. 62-112 (issued also as a reprint), Löpfe-Benz, Rorschach. ISBN 3-85819-084-5. — (Author: Wiesentalstr. 6c, CH-9000 St. Gallen).

On p. 93, there are col. photographs of 4 odon. spp., contributed by A. TREAGUST (Postfach 1015, CH-9202 Gossau-2). Locality data are not mentioned in the book, but could be obtained from the photographer.

1986

- (6549) GYAWALI, B.K., 1986 [published 1988]. Population dynamics of pea insects. *J. nat. Hist. Mus., Kathmandu* 10(1/4): 113-118. (With Nepali s.). — (Ent. Div., Dept Agric., Khumaltar, Lalitpur, Nepal).

On p. 116 reference is made to a "new sp." from Khumaltar, Kathmandu Valley, Nepal, given as "damselfly n.s. (Odonata: Zygoptera: Agridae)". [sic!]

- (6550) PAVLYUK, R.S., 1986. O predelakh gostal'noy specifichnosti lichinochnykh stadiy gel'mintov razvivayushchihsvya v organizme strekoz. — [On the host specificity of the helminth larval stages developing in dragonflies]. *Mater. Konf. ukrain. Obshch. Parazitol., Odessa 2*: 88. (Russ.; extensive abstract only). — (Dept Invert. Zool., Lvov Univ., 4 Shcherbakov St., USSR-290005 Lvov).

The host specificity of various trematode and

nematode spp. in the Ukrainian dragonflies is stated.

- (6551) PAVLYUK, R.S. & T.M. KURBANOVA, 1986. Parazitofauna strekoz yuzhnykh rayonov Turkmenii. — [Parasite fauna of dragonflies in the southern districts of Turkmenia]. *Mater. Konf. ukrain. Obshch. Parazitol., Odessa 2*: 89. (Russ.; extensive abstract only). — (Second Author: Srednaya Shkola No. 21, USSR-744008 Ashabad).

A review is given of the gregarine, trematode and the acarine parasites evidenced in larval and adult individuals of 16 odon. spp. from Turkmenia, USSR. — (For a list of the Odon. of Turkmenia cf. *OA* 5198).

1987

- (6552) AZUMA, S., [Ed.], 1987. *Field guide-book to the insects of Okinawa*, Vol. 4: *Odonata, Orthoptera, Phasmida et al.* Okinawa Shuppan, Urasoe, Okinawa. XIV+249 pp. (14x19 cm, hardcover). — Sold as a complete set of 4 vols only; price in Japan: Y 18,000.- net. (Jap., with Engl. title). — (Publishers: 708-11 Miyagi, Urasoe, JA).

The Odon. are dealt with on pp. 1-72. In all, 45 spp. are presented. For each of these 1 or more high quality col. phot. of the adult stage are presented (of both sexes, where appropriate) often also a phot. of the larval stage. Each sp. is briefly diagnosed and described. The infraspecific status of the local *Crocothemis servilia* is still uncertain. — (For another work on the insects/odon. of Okinawa cf. *OA* 4591).

- (6553) CALABRESE, E.J., C.C. CHAMBERLAIN, R. COLER & M. YOUNG, 1987. The effects of trichloroacetic acid, a widespread product of chlorine disinfection, on the dragonfly nymph respiration. *J. environ. Sci. Health (A)* 22(4): 343-355. — (Last Author: Dept Chem., Univ. Massachusetts, Amherst, Mass. 01002, USA).

The effects of trichloroacetic acid (TCAA), a newly recognized non-volatile product of chlorine disinfection, on *Aeshna* and *Basiaeschna* larvae are assessed. The TCAA range from 1-1000 ppb for a 96 hr period is utilized, using a

- flow-through exposure system. The results indicate a dose-dependent increase of oxygen utilization which achieves statistical significance from control values at 100 and 1000 ppb. While previously published efforts have emphasized possible public health effects of TCAA as a result of consumption of chlorinated drinking water, the present findings indicate that TCAA is capable of causing environmental physiological alterations in an aquatic model organism in a model flow-through system at environmentally relevant concentrations.
- (6554) CSORBA, G., 1987. Néhány hazánkban ritka szitakötőfaj előfordulása Magyarországon (Odonata, Anisoptera). — New faunistic data of some dragonfly species, rare in Hungary (Odonata, Anisoptera). *Fol. ent. hung.* 48: 291-292. (Hung., with Engl. title). — (Author's address not stated).
Records of 7 spp. are listed, *Aeshna viridis* and *Leucorrhinia caudalis* are discussed, and the terminalia of the former are figured.
- (6555) HAESLER, V., 1987. Insekten-Besiedlung der Insel Mellum. In: G. Gerdes, W.E. Krumbein & H.-E. Reineck, [Eds], Mellum, Portrait einer Insel, pp. 266-280, Kramer, Frankfurt/Main (Senckenberg-Buch 63; ISBN 3-7829-1107-5). — (Author's address not stated).
Only 3 odon. spp. were so far recorded in the literature from the Northsea island of Mellum, FRG (cf. B. Kiauta, 1968, *Biol. Jaarb. Dodonaea* 36: 88-114), while 28 spp. are known to occur there now. The list of these is not given, but it can be obtained from Dipl.-Zool. J. Lempert (Prinz-Albert-Str. 38, D-5300 Bonn-I, FRG). The odon. fauna of the island is briefly discussed, with emphasis on the well known migrations and a list is given of the 9 spp. whose breeding on the island was recently evidenced.
- (6556) HARITONOV, A.Yu., 1987. Redkie strekozy SSSR i ih ohrana. — [Rare dragonflies of the USSR and their conservation]. In: Problemy ohrany redkih zivotnyh. (Materialy k Krasnoy knige), pp. 153-158, Glavnoe upravlenie ohotnich'ego hozyaystva i zapovednikov, Sovet Ministrov RSFSR, Moscow. (Russ.). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).
Based on the recommendations of the First All-Union Symposium of Odonatology (cf. OA 5680), annotations are presented on 16 spp. to be included in a new edition of the USSR Red Data Book. (For the first edition cf. OA 5090).
- (6557) HIEKEL, I., 1987. Bedeutende Vorkommen gefährdeter Libellenarten an Fließgewässern im Kreis Cottbus-Land. *Natur Landsch. Bez. Cottbus* 9: 25-36. — (Anne-Frank-Str. 26, DDR-7513 Cottbus, GDR).
A systematic survey was conducted (1986) on the odon. fauna (11 spp.) of the stream system between Babow and Greifenhain, distr. Cottbus, GDR. The local status of *Calopteryx virgo*, *Gomphus vulgatissimus*, *Ophiogomphus serpentinus* and *Cordulegaster boltonii* is discussed in detail.
- (6558) JAESCHKE, G., 1987. Untersuchungen zur Artenzusammensetzung und Dominanz verkehrstoter Insekten — erste Ergebnisse. *NaturschutzArb. Berlin Brandenburg* 23(2/3): 70-83. — (Author's address not stated).
Out of some 7700 specimens, referable to 10 orders, only 7 odon. individuals were recorded victims of traffic.
- (6559) LAFOND, R., 1987. Nouvelle localité septentrionale pour *Calopteryx amata* Hagen et *Calopteryx maculata* Beauvois au Québec. *Fabries* 13(3/4): 49-50. — (Dép. Techn. Forestière, CEGEP de Rimouski, 60 ouest rue de l'Évêché, Rimouski, Que., G5L 4H6, CA).
With reference to the paper listed in OA 5748, the 2 spp. are recorded from the Accores R., nr Rimouski, Quebec, Canada.
- (6560) LEGAULT, J., 1987. Observation de l'accouplement et de la ponte de *Calopteryx maculata* Beauvois (odonates: Calopterygidae) au ruisseau Selby (d.r. de Missisquoi, Québec). *Fabries* 13(3/4): 45-46. — (62 place Leroy, Repentigny, Que., J6A 1PS, CA).
Field notes on mating behaviour and oviposition.

- (6561) LOTZING, K., 1987. Beiträge zur Faunakarrierung des Kreises Stassfurt. Teil 2: Die Segellibellen. *Abh. Ber. Naturk. Vorgesch., Magdeburg* 13: 85-93. — (Clara-Zetkin-Str. 4, DDR-3251 Unseburg, GDR).
The distribution of 7 libellulid spp. in the district of Stassfurt, GDR is mapped and their occurrence is discussed.
- (6562) MAUERSBERGER, R., 1987. Zur Libellenfauna von Berlin-Köpenick und Umgebung. *Naturschutz Arb. Berlin Brandenburg* 23(2/3): 60-69. — (Kölnische Str. 35a, DDR-1190 Berlin, GDR).
The fauna (43 spp.) is listed and discussed, and comments are given on some spp. of special interest. Figs of the exuviae of *Gomphus* (= *Stylurus*) *flavipes*, *Somatochlora metallica*, *S. flavomaculata*, *Libellula depressa*, *L. fulva*, *L. quadrimaculata* and *Orthetrum cancellatum* are also provided.
- (6563) MÉNARD, R., 1987. Captures d'odonates dans la Vallée de l'Outaouais et dans la Haute-Gatineau en 1987. *Fabriques* 13(3/4): 53-56. (With Engl. s.). — (58 rue Smith, Gatineau, Que., J8T 3A1, CA).
A list of 75 spp. collected in the Ottawa R. Valley is presented and briefly discussed. *Williamsonia fletcheri* (Alfred marsh) and *Libellula incesta* (Bell lake nr Masham) are among the noteworthy records.
- (6564) ORMACHEA-A., E., 1987. Nota sobre la entomofauna de la Laguna Huaype-Cusco. *Revta peru. Ent.* 29: 117-118. (With Engl. s.). — (Depto Cien. Biol., Univ. Nac. Cusco, Cusco, Peru).
8 odon. genera are reported from Laguna de Huaypo, nr Chaca, distr. Chincheros, prov. Urubamba, 40 km from Cusco, Peru, alt. 3507 m. The larvae are briefly described, but they are not identified to the sp. level.
- (6565) SAVARD, M., 1987. Présence hypothétique de *Tachopteryx thoreyi* au Québec et au Canada (Odonata: Petaluridae). *Fabriques* 13(3/4): 47-48. — (840 Bourgeois Ouest, Alma, Que., G8B 4J6, CA).
The provenance of L. Provancher's famous specimen is discussed and it is concluded that the occurrence of this sp. in Canada should be considered hypothetical until the 1877 record will have been confirmed.
- (6566) STEINMANN, E., 1987. Insektenvielfalt. In: P.E. Müller, [Ed.], *Tierwelt der Berge*, pp. 115-117. Terra Grischuna Verlag, Chur. ISBN 3-7298-1044-8. — (Montalinstr. 16, CH-7000 Chur).
A general article on insects, published in a book on the mountain animal world of canton Grisons, Switzerland. It includes a photograph of *Cordulegaster bidentatus* (without locality data) and a reference to the 44 regional odon. spp. as given in the paper listed in OA 2913. It is said that "many of these are rare or threatened".
- (6567) THOMAS, A., 1987. Auswirkungen anthropogener Veränderungen eines norddeutschen Tieflandbaches auf die Libellenfauna. *Limnologica* 18(2): 253-268, col. pls 1-2 excl. (With Engl. s.). — (In de Grund 5, D-2371 Bovenau, FRG).
Spatial distribution of the Odon. on the Untere Schierensee bach, SW of Kiel, FRG (26 spp., of which 14 autochthonous) is discussed in terms of habitat preferences and human impact, particularly with reference to anthropogenic alterations in vegetation.
- (6568) UEDA, T., 1987. Factors affecting the operational sex ratio of the damselfly, *Cercion calamorum* Ris (Odonata: Zygoptera): *Bull. Ishikawa agric. Coll.* 17: 41-51. (Jap., with Engl. s.). — (Lab. Nat. Sci., Ishikawa Agric. Coll., Suematsu, Nonoichi-machi, Ishikawa Pref., 921, JA).
Several population parameters affecting the operational sex ratio were investigated by mark-recapture method in Kyoto, Japan. — The sex ratios on emergence were even. There was no sexual difference in daily survival rate during the maturation period (0.837 for males, 0.833 for females). The length of the maturation period for most individuals was 10 days (males) and 12 days (females). The daily survival rate for mature females was slightly higher than that for mature males (0.861 vs. 0.839).

The sex ratio ($\text{♀}/\text{♂}$) of the total mature individuals which was obtained by calculating the above parameters was 0.79. — The arrival rate for mature males at the reproductive area depended on the ambient temperature and therefore usually reached up to 1.0 on hot days in the summer. The mature females arrived at the reproductive area to oviposit at intervals of two or three days, suggesting that the daily arrival rate of the mature females at the reproductive area was, on the average, 0.29. Thus the operational sex ratio on the basis of a day, assuming that the arrival rate of mature males is 1.0, is estimated as 0.22. It was very close to the observed sex ratio; i.e. 0.23 (July) and 0.18 (Aug.). — The sex ratio of the damselflies at the reproductive area on a census, that is, the sex ratio at a moment, was skewed still more toward males. This may reflect the sexual difference of the mean duration of staying at the reproductive area (414 min. for males and 126 min. for females). The expected sex ratio on a census added in the above parameter was also close to the observed one in August (0.066 vs. 0.065), but not the ones in the early season probably because of the lower arrival rate of males at the reproductive area due to low temperature.

- (6569) WALKER, D.H. & A.R. PITTAWAY, 1987. *Insects of eastern Arabia*. Macmillan, London-Basingstoke. XVI+175 pp. — (Available from SIO, at Hfl. 55.- approx.). The area covered is bounded in the N by Iraq, the Najad Plateau to the W, the Ar Rub Al Khal to the S and the Arabian Gulf to the E. It is the first field guide dealing with the Odon. of the Arabian peninsula. On pp. 3-13, 19 spp. are described, nice watercolour figs of all of them are provided and col. distribution maps are give. The information supplied includes notes on habitats, phenology, habits, migrations and on regional morphological variations, where appropriate.

1988

- (6570) (Anonymous), 1988. [Book review]. The dragonflies of Europe, by R.R. Askew. *Antenna* 12(4): 166.

An indicative text on the volume listed in OA 6357.

- (6571) ARNOLD, A., 1988. Zur Libellenfauna (Odonata) von zwei Thermalbädern bei Oradea, Rumänien. *Ent. Nachr. Ber.* 32(2): 91-92. — (Wildenfesler Str. 34, DDR-9513 Langenbach, GDR). 7 spp., collected 2/3-VIII-1984 and 11/12-IX-1985 at thermal springs Baile "Felix" and Baile "1. Mai" (formerly Baile Episcopesti), SE from Oradea, Romania are listed and annotated. *Orthetrum anceps* is discussed in some detail.
- (6572) ASAHINA, S., 1988. North Indian *Onychogomphus bistrigatus*, again. *Gekkan Mushi* 213: 26-27. (Jap., with Engl. s.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA). Checking the photographic material gathered during his 1976 visit to the MCZ, the author discovered the photograph of a broken female specimen, which very likely represents Hagen's type of this sp. This settles long-standing problems, as outlined also in the paper listed in OA 6356.
- (6573) ASAHINA, S., 1988. Notes on some Chinese Odonata in the collection of Cornell University. *Akitu* (N.S.) 101: 1-8. — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA). 11 spp. were rechecked. *Pseudagrion elongatum* Needham is synonymized with *P. pruinosum fraseri* Schmidt, *Orthetrum devium* Needham with *O. luzonicum* (Brauer), and *Sympetrum fatigans* Needham with *S. unifornae* (Selys).
- (6574) ASAHINA, S., 1988. A revised list of the Odonata of Hong Kong. Part II, Anisoptera. *Kontyu* 56(4): 689-705. — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA). The Zygoptera part was published in *Tombo* and it is listed in OA 6163. In the present paper 38 spp. are dealt with, incl. 4 previously unidentified spp. and 3 additions to the fauna. *Leptogomphus elegans hongkongensis* ssp. n. is proposed for "*Leptogomphus perforatus* subsp. (?)" Asahina, 1965 (*Kontyu* 33: 500). The male is described and figured (holotype: Lam Tsuen Valley, 30-V-1965); the female is unknown.

- (6575) [BABECK-REINSCH, G.], 1988. Rheinfelden verfügt über eine Besonderheit: ein Naturschutzgebiet am Rhein? *Badische Ztg.* 43(171): R17 (issue of July 27). — (Ausserdorf 18, D-7841 Marzell, FRG).
The gravel pit "Weberalten" (surface 6 ha approx.), nr Rheinfelden, Baden-Württemberg, southern Germany represents a significant breeding habitat for a number of regionally important odon. spp. (incl. the 4 Central European Orthetrum spp.; for a review cf. the paper by R. Buchwald, listed in *OA* 5262). In this local daily's article the political situation relative to the conservation of the locality is briefly outlined, and some statements by the odonatologist, District Council Member and Scientific Officer of the Green Party in the Bundestag, H. Lohmann (Ziegelackerweg 1, D-7888 Rheinfelden, FRG), are quoted.
- (6576) [BABECK-REINISCH, G.], 1988. Der Sandgrubengraben [...]. Rare Libellenarten legen Eier in die Brunnenkresse. *Badische Ztg.* 43(171): R17 (issue of July 27). — (Ausserdorf 18, D-7841 Marzell, GFR).
The "Sandgrubengraben" is a ditch situated between the localities of Nollingen and Degerfelden, in the Rheinfelden area, Baden-Württemberg, southern Germany. The well-known odonatologist and Member of the District Council, H. Lohmann (Ziegelackerweg 1, D-7888 Rheinfelden, FRG), discovered in it a number of regionally important "Red List" odon. spp. (viz. *Coenagrion mercuriale*, *Onychogomphus forcipatus*, *Orthetrum brunneum*, *O. coerulescens*, *Sympetrum pedemontanum*) and advocated management measures aiming at conservation of this breeding site. This article, in a regional daily, is based on an interview with Mr Lohmann (whose portrait is also provided). According to an anonymous note in the same newspaper (43 [226]: R25; of Sept. 29, 1988), his arguments were accepted and the new management will be applied as from 1989 onwards.
- (6577) BENTON, E., 1988. *The dragonflies of Essex*. 136 pp., col. frontispiece, 1 col. pl., 1 map excl. Essex Field Club, London. — ISBN 0-905637-14-3. — Price £ 5.95 net. — (Author: Dept Sociol., Univ. Essex, Wivenhoe Park, Colchester, C04 3SQ, UK; — Publishers: Essex Field Club, Passmore Edwards Mus., Rumford Rd, London, E15 4LZ, UK).
The book is designed as a "handbook" on the dragonflies of Essex, UK, and is based on regional surveys commenced in 1980. Following a brief Introduction, pp. 5-45 are devoted to the natural history and habitats of the Essex Odon., most of the remaining part dealing with accounts of the 28 regional spp. (incl. brief diagnostic characters, detailed lists of all records, characterisation of habitats and distribution maps). Also provided is a well illustrated key. Unfortunately the latter has not been tried out; it includes only regional taxa, therefore its value is limited, though the key makes the booklet somewhat more "self-sufficient" to a strictly locally interested user. The regional bibliography is exhaustive and will certainly be most useful. — Among the ever increasing, commercially available books on the British regional odon. fauna (cf. *OA* 3734, 4715, 4935, 5334, 5383, 6265) this is certainly the most attractive, informative and luxuriously produced work.
- (6578) BLOIS-HEULIN, C. & A. CLOAREC, 1988. Diel variations of food intake in *Anax* imparator and *Aeshna cyanea* larvae. *Biol. Behav.* 13: 116-124. (With Fr. s.). — (Lab. Ethol., Univ. Rennes I, Avenue du Général Leclerc, F-35042 Rennes).
The daily rhythm of food intake in the 2 spp. appears biphasic, with peaks after sunset and before dawn. The rhythmicity varies with the instar, but no significant differences could be evidenced between the 2 spp.
- (6579) BRAUCKMANN, C., 1988. Zwei neue Insekten (Odonata, Megaseoptera) aus dem Namurium von Hagen-Vorhalle (West-Deutschland). *Dortmund. Beitr. Landesk. (Naturwiss.)* 22: 91-101. (With Engl. s.). — (Fuhlrott-Mus., Auer Schulstr. 20, D-5600 Wuppertal-I, FRG).
To the taxa described in the paper listed in *OA* 6467, *Zessinella siope* gen. n., sp. n., from the same locality, is added. Description, figs and

- discussion on the affinities of the new taxon (in the Erasipteridae) are provided.
- (6580) BRITISH DRAGONFLY SOCIETY, 1988. *Code of practice on collecting dragonflies in the United Kingdom*. Purley, 4 pp. — (c/o Mrs R.I. Silsby, 1 Haydn Ave, Purley, Surrey CR2 4AG, UK).
The Code is organised into 4 sections, viz. "Assumptions and background information", "The occasions when dragonflies can legitimately be collected", "Points to be observed when collecting" and "Collecting dragonflies and the Law". — *Anaciaeschna isosceles* is currently the only sp. totally protected under the Wildlife and Countryside Act 1981.
- (6581) BRITISH DRAGONFLY SOCIETY, 1988. *Pond construction for dragonflies*. Purley, II+9 pp. — (c/o Mrs R.I. Silsby, 1 Haydn Ave., Purley, Surrey CR2 4AG, UK).
Construction, development and maintenance are outlined, and a chapter is provided on the renovation and maintenance of existing ponds.
- (6582) BUCHWALD, R., 1988. Die Gestreifte Quelljunfer *Cordulegaster bidentatus* (Odonata) in Südwestdeutschland. *Carolinea* 46: 49-64. (With Engl. s.). — (Inst. Biol. II, Univ. Freiburg, Schänzlerstr. 1, D-7800 Freiburg/Br., FRG).
58 localities of *C. bidentatus* in SW Germany were investigated and analysed. In the area studied the sp. occurs in 2 types of habitats, viz. (1) springs and rivulets in the vicinity of woodlands, and (2) calcareous spring mires and marshes of the pre-alpine region, adjacent to woods with springs. The waters are slow-flowing, shallow and mostly narrow. Important is a high proportion of semi-natural deciduous and mixed forest, with a minimum of 50% of deciduous trees. The co-occurrence with *C. boltoni* is described and the modes of avoidance of interspecific competition are discussed. A hypothesis is presented on the factors governing habitat selection, and tentative measures relative to habitat conservation are suggested.
- (6583) BUCK, K., 1988. Libellen in Wald und Moor. *Steinburger Jb.* 33 [1989]: 70-83. — (Johann-Meyer-Str. 3A, D-2213 Wilster, FRG).
A general outline of dragonfly biology, directed at the general reader with the aim of promoting "ecological awareness" and habitat conservation. The paper is based on observations (May-Oct., 1988) in the district of Steinburg, West Holstein, FRG and includes (mostly col.) portraits of 10 spp., of which *Aeshna viridis* is of particular interest.
- (6584) CANNINGS, R., 1988. Wet week in Wells Gray Park. *Boreus* 8(2): 6-7. — (Ent. Div., Royal British Columbia Prov. Mus., 601 Belleville St., Victoria, B.C. V8V 1X4, CA).
The Park lies in east-central British Columbia, Canada, between the Cariboo Mts and the Fraser R., just N of the big, warm valleys. However, few of the southern spp. reach the alpine plateaus, and the fauna is almost entirely boreal in nature. A list is presented of the Odon. collected there during the 3rd week of Aug., incl. 9 *Aeshna* spp.
- (6585) DHILLON, S.S., R. SANDHU & I. MALHOTRA, 1988. Chromosomal studies of three species of dragonflies. *Abstr. Pap. Int. Symp. recent Adv. cytogen. Res., Kurukshetra*, p. 16. [Abstract only]. — (Dept Zool., Punjabi Univ., Patiala-147002, India). [Almost verbatim]: The male chromosomes of *Crocothemis* sp. [spelled "Crocothemus"], *Nepogomphus modestus* and *Sympetrum striolatum* were studied. The spermatogonial metaphase of the first sp. revealed $2n = 26$, with XY sex determination, while the diploid set of the latter 2 spp. is $2n = 25$, with an XO sex determining mode.
- (6586) DIESING, P., 1988. Beobachtungen und Zeitmessungen zum Verhalten der Gebänderten Prachtlibelle (*Calopteryx splendens* (Harr.)) *Beitr. Naturk. Niedersachs.* 41: 277-284. (With Engl. s.). — (Lupinenstr. 29, D-4590 Cloppenburg, FRG).
The duration of flight (mean 20 s) and perch (mean 40 s) was measured in a population on the Soeste R., Cloppenburg, Lower Saxony. The marked individuals were recovered up to 2 weeks after marking.

- (6587) EDELAAR, P. & N. BOLT, 1988. De libellen van Terschelling. — [Dragonflies from Terschelling]. *Amoeba, Amst.* 62(7): 10-11. (Dutch). — (First Author: Fazantlaan 44, NL-2211 KV Noordwijkerhout).
With reference to the note listed in *OA* 6248, the general occurrence of 17 spp. on the Northsea island of Terschelling, the Netherlands is briefly stated, without exact locality data and collection dates.
- (6588) *FRASERIA*. Newsletter of the S.I.O. South Asia Regional Office, Jodhpur, Nos 14/15 (Dec. 1, 1988). — (c/o Dr B.K. Tyagi, G-193, Shastri Nagar, Jodhpur-342003, India).
With the present issue, Prof. S.H. Chowdhury (Chittagong, Bangladesh) joined the Editorial Board. — Contents: *Tyagi, B.K.*: Ninth International Symposium of Odonatology: a report (pp. 57-60); — *Tyagi, A.*: SIO Chairman and the SIO Treasurer-General visited the home of Dr Tyagi (p. 60); — *Editors* [= *B. Kiauita*]: Mr M. Mahato in the United States (pp. 60-61; with his 1984-1988 bibliography on the Odon. of Nepal); — *Thomas, M., M. Gladstone & A. Mohan Daniel*: A note on inter-species predation among odonates (p. 62); — *Srivastava, V.K.*: South-East Asian Symposium of Odonatology — a suggestion (p. 62); — *Tyagi, B.K.*: The dragonfly project (pp. 62-63; Nepal expedition, as reported in *OA* 6517); — Some new dragonfly publications (pp. 63-64; book reviews of the titles listed in *OA* 6393, 6472); — *Thomas, M. & A. Mohan Daniel*: Studies on the feeding behaviour of odonates (p. 64); — *Srivastava, V.K.*: Felicitations to Professor B.K. Srivastava (pp. 64-65); — *Tyagi, B.K.*: Dr Mathavan moved to France (p. 65); — *Callicnemis miniata doonensis* Sangal & Tyagi, 1984 (p. 65); — Editorial news (p. 65).
- (6589) FUKUI, M., 1988. Ecological observations of *Libellula angelina* Selys (Libellulidae, Odonata) on Okegayanuma, Iwata-city, Shizuoka Pref. *Gekkan Mushi* 212: 5-11. (Jap., with Engl. title). — (Kamo 60-1, Kikugawa-cho, Ogasa-gun, Shizuoka, 439, JA).
[Abstract not available].
- (6590) GEIGER, W., 1988. Bibliographie concernant la faune entomologique suisse, 1986. *Bull. romand Ent.* 6(2): 105-114. — (Inst. Zool., Univ. Neuchâtel, CH-2000 Neuchâtel).
Contains 8 papers on Odon.
- (6591) GONZALEZ-SORIANO, E. & C. COOK, 1988. Una nueva especie de *Epigomphus* Selys 1854 (Odonata, Gomphidae) del Estado de Veracruz, Mexico. *Fol. ent. mex.* 74: 5-12. (With Engl. s.). — (Second Author: Box 16, Hwy 218, Center, Kentucky 42214, USA).
E. donnellyi sp. n. (holotype ♂: Mexico, Veracruz: Arroyo en Ejido La Palma, ca 25 km N of Catemaco, 7-VII-1986) is described from a large series of adults of both sexes. Its structural features are figured, habitat and habits outlined, and its systematic affinities are pointed out. It belongs to the group of spp. that have a complete second antehumeral stripe. The holotype, allotype and 5 paratypes are in IBUNAM, some paratypes are with the second author and with Dr T.W. Donnelly (Binghamton).
- (6592) GÜNTHER, K.K., 1988. [Buchbesprechung]. Bellmann H., Libellen: beobachten — bestimmen. *Dt. ent. Z. (NF)* 35(4/5): 264. — (Mus. Naturk., Humboldt Univ., Invalidenstr. 43, DDR-1040 Berlin, GDR).
Book review of the volume listed in *OA* 6111.
- (6593) HEUSINGER, G., A. KOETTER, H. PLACHTER & M. REICH, [Eds], 1988. *Beiträge zum Artenschutz. 4. Libellen*. 150 pp. Bayerisches Landesamt für Umweltschutz, München (*SchrReihe bayer. Landsamt Nat-Schutz* 79). — ISSN 0723-0028. Price in FRG: DM 19.- net. Also available from the SIO.
The book (A4 size) is a collection of 14 papers on the Odon. of Bavaria, FRG, viz. *Kuhn, K., P. Beck & M. Reich*: Vorschlag für eine Neufassung der Roten Liste der in Bayern gefährdeten Libellen (Odonata) (Stand 31.12.1986) (pp. 7-12); — *Burmeister, E.-G.*: Unsere heimischen Libellen — Aufgaben für die Faunistik und Vorschläge für Hilfsprogramme (pp. 13-26); — *Reich, M. & K. Kuhn*: Stand der Libellenerfassung in Bayern und Anwendbarkeit der Ergebnisse in Arten- und Biotopschutzprogrammen (pp. 27-65; 73 spp., with

- distribution maps for 26 spp.); — *Mandery, K.*: Erfassung von Libellenbeständen mit dem Ziel der Bewertung von Feuchtlebensräumen und Libellenschutz im Landkreis Hassberge (pp. 67-74); — *Kognitzki, S.*: Die Libellenfauna des Landkreises Erlangen-Höchstadt: Biotope — Gefährdung — Förderungsmassnahmen (pp. 75-82). — *Beck, P.*: Libellenkartierung im nordwestlichen Oberfranken (pp. 83-86); — *Grimmer, F.*: Libellenkartierung im Raum Nürnberg (pp. 87-93); *Weiskopf, G.*: Libellenkartierung im Landkreis Fürth (pp. 95-100); — *Kuhn, K.*: Die naturräumliche Gliederung der Libellenfauna des Landkreises Aichach-Friedberg (pp. 101-111); — *Dirnfelder, L.*: Beitrag zur Libellenfauna der niederbayerischen Donauebene (Stand 1987) (pp. 113-118); — *Fischer, R.*: Qualitative und quantitative Erfassung der Odonatenfauna zur Festlegung von Dauerbeobachtungsflächen im Sulztal und Ottmaringer Tal (pp. 119-125); — *Beyer, S.*: Gebänderte Heidelibelle (*Symptetrum pedemontanum*) und Südlicher Blaupfeil (*Orthetrum brunneum*) an Wiesenrändern im Coburger Land (pp. 125-129); — *Steiger, S.*: Untersuchungen zur Populationsentwicklung von *Coenagrion puella* L. (pp. 130-136); — *Kognitzki, S.*: Untersuchungen zur Libellenfauna von neugeschaffenen Sekundärgewässern in Nürnberg und Umgebung (pp. 137-141).
- (6594) **HIRATSUKA, K.**, 1988. Some dragonfly from Hokkaido. *Nature & Insects* 23(12): 17-19. (Jap., with Engl. title).
[Abstract and the transliteration of author's address not available].
- (6595) **HOUSTON, W.W.K. & J.A.L. WATSON**, 1988. Odonata: *Zool. Catal. Aust.* 6: 33-132, 283 (taxonomic decisions), 289-299 (taxonomic index). — (Second & principal Author: Div. Ent., C.S.I.R.O., P.O. Box 1700, Canberra, A.C.T. 2601, AU).
J.C. Fabricius (1773) described the first Australian odon. sp., *Neurothemis stigmatizans* (under the names *Libellula stigmatizans* and *L. oculata*), from specimens in the Banks collection, gathered at the Endeavour River during Captain Cook's enforced sojourn there in 1770. Some 100 genera and slightly more than 300 spp. are now known to occur in Australia; those described prior to 1 May 1987, are dealt with in the present catalogue. For each genus and sp. the usual nomenclatural, taxonomic and bibliographic information is presented along with brief statements on type, distribution and ecology (where appropriate). All new taxonomic decisions were made by J.A.L. Watson, viz. 1 replacement name: *Libellula haematodes* Burmeister, 1859 for *L. sanguinea* Macleay, 1827 nec Müller, 1764; — 4 new status assignments: *Austropetalia* Tillyard, 1916 resurrected from synonymy; — *Isosticta simplex* not congeneric with *I. spinipes* Selys, 1885; — *Libellula sanguinea* Macleay, 1827 junior primary homonym of *L. sanguinea* Müller, 1764; — *Synthemis guttata punctata* Martin, 1906 is a nomen nudum; — and 6 new synonyms: *Agrion brisbanense* Tillyard, 1917 = *Coenagrion lyelli* Tillyard, 1913; — *Antipodogomphus acolytus* Fraser, 1951 = *A. acolythus* Martin, 1901; — *A. prosoletus* Fraser, 1951 = *A. prosoletus* Martin, 1901; — *Austrocoenagrion* Kennedy, 1920 = *Coenagrion* Kirby, 1890; — *Libellula haematodes* Burmeister, 1839 = *Diplacodes haematodes* (Burm., 1839); — and *Trithemis rubra* Kirby, 1884 = *Diplacodes haematodes* (Burm., 1839).
- (6596) **INDIAN ODONATOLOGY**. Journal of the South Asian Regional Office of the International Odonatological Society (S.I.O.), Jodhpur, Vol. 1 (Dec. 1, 1988). Edited by Dr B.K. Tyagi. — Annual subscription: US \$ 30.- (institutions & libraries), US \$ 20.- (individual subscribers). Available from the S.I.O. Central Office (P.O. Box 256, NL-3720 AG Bilthoven, Holland, or from the S.I.O. South Regional Office, G-193 Shastri Nagar, Jodhpur-342003, India, or from any of the S.I.O. National Offices, or from the S.I.O. International Odonata Research Institute, P.O. Box 1269, Gainesville, FL 32602-1269, USA. — Special fee in India, and 25% discount for S.I.O. members resident in Southern Asia. — Single issues 35% surcharge on subscription price. This is a fully fledged international periodical, published annually on Dec. 1, and edited by an international Editorial Board. All papers are

- refereed. — Contents: *Tyagi, B.K.*: Preface (pp. i-ii); — *Srivastava, V.K. & B.K. Srivastava*: Structure and musculature of the secondary copulatory apparatus in male Zygoptera (Odonata), with special reference to its role in excretion and sperm transfer (pp. 1-15); — *Tembhare, D.B. & M.W. Khan*, Effect of external salinity on the rectal epithelial ionic transport in the larvae of *Pantala flavescens* (Fabricius) (Anisoptera: Libellulidae) (pp. 17-24); — *Vidvasagar, P.S.P.V. & M.A. Qayyum*: Studies on the neurosecretory system of *Coenagrion dyeri* (Fraser) (Odonata: Coenagrionidae) (pp. 25-34); — *Kumar, A.*: Studies on the life history of *Neurothemis tullia* (Drury) from Dehra Dun, India (Odonata: Libellulidae) (pp. 35-44); — *Prasad, M.*: Introduction to the external morphology of the odonate male accessory genitalia, with descriptions of sixty-three cases in Northwest Indian species (pp. 45-88); — *Tembhare, D.B.*: Endocrinology of Odonata, with special reference to Orthetrum chrysis Selys from India (pp. 89-125); — *Va-radaraj, G.*: Changes in carbohydrate concentrations of the haemolymph during development in *Anax immaculifrons* Rambur (Odonata: Aeshnidae) (pp. 127-133); — *Donnelly, T.W.*: On the male of *Idionyx nadganiensis* Fraser from Nilgiri Hills (Odonata: Corduliidae) (pp. 135-137); — *Pajni, H.R. & P.K. Tewari*: Some notes on the Odonata of Chandigarh and other areas in North-West India (pp. 139-141).
- (6597) *ISHIDA, S. & K. ISHIDA*, 1988. Odonata. In: T. Kawai, [Ed.], An illustrated book of aquatic insects of Japan, pp. 33-124. Tokai Univ. Press, Tokyo. — ISBN 4-486-00884-7. (Jap., with Engl. title). — (Second Author: 3-201, Aoiyama-danchi, 1-148 Hisakata, Tempaku-ku, Nagoya, 468, JA).
Reprint edition of the work listed in OA 5396 where the authorship should correctly read as above! It is an excellent handbook, but it is unfortunate that the nomenclature was not brought in agreement with the Code and modern usage, e.g. "Agrionidae", "Aeshnidae", "Cordulegasteridae".
- (6598) IUCH Conservation Monitoring Centre, 1988. 1988 IUCN Red List of threatened animals. IUCN, Gland/CH-Cambridge/UK. XVIII+154 pp. — ISBN 2-88032-935-3. — (Available from the SIO).
As far as the Odon. are concerned (pp. 109-113), the 1986 list (cf. OA 5736) is revised and corrected. It now includes 123 spp. and sspp. — (*Abstracter's Note*: The clarity of the list could be enhanced if trinomial nomenclature was used in cases where the populations of the nominate ssp. are considered threatened rather than those of the other sspp. It is not clear, therefore, whether e.g. *Coenagrion mercuriale*/Europe" covers also *C. m. castellani* in Italy, though it certainly does not cover the African *C. m. hermeticum*).
- (6599) *JAKOBS, W.*, 1988. Weitere Fundorte des Kleinen Granatauges (*Erythromma viridulum* Charp.) (Odonata). *Ent. Nachr. Ber.* 32(4): 183. — (Thomas-Müntzer-Str. 2, DDR-4600 Wittenberg, GDR).
Additions to the paper listed in OA 6252.
- (6600) *JENTZSCH, M. & T. NORGALL*, 1988. Drei seltene Libellenarten in der Goldenen Aue südlich von Sangerhausen. *Naturschutz Arb. Bez. Halle Magdeburg* 25(2): iv-vi. — (First Author: Kirchstr. 16, DDR-4701 Oberröblingen, GDR).
Calopteryx splendens, *Coenagrion mercuriale* and *Sympetrum pedemontanum* are recorded from the area of Sangerhausen, GDR. The habitats are described in detail and management measures are suggested.
- (6601) *JOURNAL OF THE BRITISH DRAGONFLY SOCIETY*, Vol. 4, No. 2 (Nov., 1988). — (c/o Mrs R.I. Silsby, 1 Haydn Ave., Purley, Surrey, CR2 4AG, UK).
Dawson, N.: Forty years on: a comparison of the dragonfly fauna of Bedfordshire in the 1940s with the situation today (pp. 25-28); — *Winsland, D.*: The formation of a regional group (New Forest) (pp. 28-30); — *Silsby, J.D. & R.I. Silsby*: Dragonflies of Jersey (pp. 31-36); — *Prendergast, N.H.D.*: The distribution and abundance of *Calopteryx splendens* (Harris), *C. virgo* (L.) and *Platycnemis pennipes* (Pallas) on the Wey river system (Hampshire and

- Surrey) (pp. 37-44); — Book reviews of the works listed in *OA* 6577 (by *S. Brooks*), 6357 (by *S. Brooks*) and 6265 (by *N. & T. Welstead*).
- (6602) KETELAAR, R., 1988. Entomofauna Hemelvaartskamp Ooypolder '88. — [Insect fauna of the May-Workshop in the Ooypolder, 1988]. *Siridula* 12(2): 17-24 (Dutch). — (Melis-Stokelaan 14, NL-1911 SL Uitgeest).
Contains a list of 10 odon. spp., collected May 11-15, 1988 in the area of the city of Nijmegen, The Netherlands. *Leucorrhinia rubicunda* from the Overasseltse and Hatertse Vennen is of some interest.
- (6603) KLEJNOTOWSKI, Z. & S. SIKORA, 1988. Liczebność i skład pożywienia dziuplaków w drzewostanie mieszanym Nadleśnictwa Zielonka podczas gradacji brudnicy mniszki (*Lymantria monacha* L.). — The number and food composition of hole-nesters inhabiting mixed tree stands in Zielonka forest inspectorate during the invasion of *Lymantria monacha* L. *Przegl. zool.* 32(1): 83-89. (Pol., with Engl. s.). — (Katedra Zoologii Akademii Rolniczej, Ul. Wojska Polskiego 71c PO-60-625 Poznań).
In order to estimate the influence of birds on an *L. monacha* invasion, the food composition of some bird spp. was studied. *Sturnus vulgaris* appears the main destroyer of the pest; it is also the only bird sp. in whose diet 1-3 odon. individuals were recorded.
- (6604) LOOS, G.H., 1988. Der Südliche Blaupfeil (*Orthetrum brunneum* Fonscolombe 1935 [sic!] in den Beckumer Bergen. *Natur & Heimat, Münster* 48(3): 69-70. — (Robert-Koch-Str. 74, D-4708 Kamen-Methler, FRG).
2 sightings of *O. brunneum* are reported from the surroundings of Münster, FRG. — (*Abstracter's Note*: The correct name of the sp. of course is "*O. brunneum* (Fonsc., 1835)". One of the results of the attempts to replace taxonomic names by artificial "vernacular names" is the fact that whenever the taxonomic name is added in parentheses, the name of the sp. author is not put in parentheses (even when necessary), whereby the Code is continuously violated).
- (6605) MARTINIA. Bulletin de liaison des Odonatologues de France, No. 10 (Dec., 1988). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois d'Arcy).
Dommanget, J.-L.: Editorial (pp. 85-86); — *Balanca, G. & M.-N. de Visscher*: Données récentes sur les odonates du sud de la Seine-et-Marne (77) (pp. 87-89); — *Dommanget, J.-L.*: [Communiqué]: Premières rencontres odonatalogiques de France (p. 90); — *Papazian, M.*: Contribution à l'inventaire de la faune odonatalogique de Provence (pp. 91-96); — *Grand, D.*: Confirmation de la présence dans le Gard (30) et l'Hérault (34) de *Macromia splendens* (Pictet, 1843) (Odonata, Anisoptera: Corduliidae) (pp. 97-101); — *Kérautret, L.*: [Annonce]: Mise en chantier d'un atlas odonatalogique de la région Nord-Pas-de-Calais (p. 101); — *Dommanget, J.-L.*: [Communiqué]: Inventaire cartographique des odonates de France (suite) (p. 102); — *Duval, B. & J.-L. Pratz*: Note relative à la présence d'*Epithea bimaculata* (Charpentier, 1825) en Forêt d'Orléans (Loiret) (Odonata, Anisoptera: Corduliidae) (pp. 103-105); — *Les Amis Naturalistes des Côteaux d'Avron*: [Annonce]: On recherche des odonatalogues en Seine-Saint-Denis (p. 106); — *Anselin A.*: [Annonce]: Observations d'odonates en Belgique (p. 106); — *Chaussadas, J.-C. & J.-L. Dommanget*: *Macromia splendens* (Pictet, 1843) en Lozère (48)? (Odonata, Anisoptera: Corduliidae) (p. 107); — *Dommanget, J.-L.*: Rubrique bibliographique (p. 108); — *Heidemann, H. & J.-L. Dommanget*: *Analyses d'ouvrages* (pp. 109-112, book reviews of volumes listed in *OA* 6181, 6282). — The issue also contains various minor announcements.
- (6606) MAUERSBERGER, G., 1988. [Buchbesprechung]. d'Aguiar, J. [et al.], Guide des Libellules d'Europe et d'Afrique du Nord. *Dr. ent. Z. (NF)* 35(1/3): 205-206. — (Kölnische Str. 35a, DDR-1190 Berlin, GDR).
Critical book review of the volume listed in *OA* 5041.
- (6607) MAUERSBERGER, R., 1988. Erstnachweis der Siberischen Winterlibelle, *Sympetma*

- paedisca Brauer, für die brandenburgischen Bezirke der DDR. *Ent. Nachr. Ber.* 32(3): 121. — (Sekt. Biowissenschaften, Karl-Marx-Universität, Talstr. 33, DDR-7010 Leipzig, GDR). On the Rarangsee/Schorfheide, district Frankfurt/Oder, *S. paedisca* co-occurs with *S. fusca*. During May-Aug., 1987 numerous individuals of both spp. were recorded. The habitat selection of the former is briefly outlined and discussed.
- (6608) MENDEL, H., 1988. Suffolk dragonflies, 1980-87. *Trans. Suffolk Nat. Soc.* 24: 27-32. — The Mus., High St. Suffolk, IP1 3QH, UK). Annotated list (31 spp.), showing the post-1980 status.
- (6609) MITRA, T.R., 1988. Note on the Odonata fauna of central India. *Rec. zool. Surv. India* 83(3/4 1986: 69-81. — (60 Shyan Nagar Rd, Calcutta-700055, India). 21 spp. are reported for the Mahadeo Hills (Oct. 21-Dec. 7, 1971), of which 11 are new to central India. For each sp. a detailed statement is made on its general distribution, and a note is given on the morphological peculiarities of the material. Incidental field observations are also mentioned, where available, and the biogeographic composition of the regional fauna is briefly analysed.
- (6610) MONTGOMERY, B.E., 1988. Odonatological bibliography of Frederick Charles Fraser. *Occ. Publs SIO natn. Office India* 3: i-v, 24 pp. — (c/o Dr B.K. Tyagi, G-193, Shastri Nagar, Jodhpur-342003, India). A revised and enlarged (Indian) edition of the publication listed in *OA* 6176, with a brief biography and a portrait. (Cf. also *OA* 6625).
- (6611) *NEWSLETTER OF THE BRITISH DRAGONFLY SOCIETY*, No. 14 (Winter, 1988). — (c/o Mrs R.I. Silsby, 1 Haydn Ave., Purley, Surrey, CR2 4AG, UK). The issue contains 18 news sections, plus the Summary Report of the BDS Committee Meeting No. 4. As from 7 Oct. 1988 the Society became (under the British Law) a "Registered Charity", and its Committee are now known as "Trustees". Due to the herewith changed legal status, the former mode of affiliation with the SIO had to be modified, though the close links between the 2 societies continue as heretofore and are to be further intensified by a joint serial publication project. As from the same date, the BDS membership stood at 2 Honorary Members, 49 Life Members and 490 Ordinary Members, the credit balance in Current & Deposit Accounts exceeding £ 4000.-. The status of the BDS members in the SIO remains unchanged, subject to confirmation by the next SIO Plenary Business Meeting.
- (6612) NOMAKUCHI, S., K. HIGASHI & M. MAEDA, 1988. Synchronization of reproductive period among the two male forms and female of the damselfly *Mnais pruinosa* Selys (Zygoptera: Calopterygidae) *Ecol. Res.* 3(2): 75-87. — (Dept Biol., Fac. Sci., Kyushu Univ., Fukuoka, 812, JA). Ecological parameters in a population of *M. pruinosa* were investigated in a mountain stream. In the study area there were 2 forms of male with regard to wing color, the orange-winged male (*esakii*) and the hyaline-winged (*strigata*), and only 1 female form with hyaline wings. Emergence of adults began in late April, and the flying season ended in late June. The time after emergence was spent in maturation, and the insects began to mate when they reached maturity. Longevity of adults was 17.6 days for *esakii* males, 18.4 days for *strigata* males and 21.9 days for females. There was little difference in emergence time, maturation period, survivorship curve and longevity among the 2 male forms and the female. In other words, the period for reproductive activities was perfectly coincident among them. The factors influencing the synchronization of emergence are discussed.
- (6613) PETERS, G., 1988. Bionomische Beobachtungen und taxonomische Untersuchungen an Anisoptera von Cuba und dem östlichen Mexico. (Insecta: Odonata). *Dr. ent. Z. (N.F.)* 35(4/5): 221-247, pls 2-6 excl. (With Engl. s.). — (Mus. Naturk., Humboldt-Universität, Invalidenstr. 43, DDR-1040 Berlin, GDR). During the period Oct-Feb. (1967/68) 20 spp. were recorded from Mexico and 33 from

- Cuba. *Anax concolor* and *Macrothemis inequinguis* are new to the fauna of Cuba. The influence of storm on migrating odon. and the crepuscular flight of large swarms were studied in some detail. The infraspecific variability gives clear evidence of phenetic separation, different from species to species, of Cuban *Erythrothemis umbrata*, *Leptthemis vesiculosa* and *Orthemis ferruginea* whereas equivalent signs of insular isolation are lacking in *Anax junius* and *Pantala flavescens*. The West Indian population of *Anax concolor* likewise expressed a few metrical and morphological differences compared with South American specimens. The degree of detectable phenetic peculiarity of Cuban or Antillean dragonfly populations seems to be correlated with the measure of vagility of the species concerned.
- (6614) PUNZO, F., 1988. Effects of low environmental pH and temperature on hatching and metabolic rates in embryos of *Anax junius* Drury (Odonata: Aeshnidae) and the role of hypoxia in the hatching process. *Comp. Biochem. Physiol. (C)* 91(2): 333-336. — (Dept Biol., Div. Sci. & Math., Univ. Tampa, Tampa, Fla 33606, USA).
Studies were conducted in order to determine the combined effects of low environmental pH and temperature on embryonic survival capacity and metabolic rates in the dragonfly, *Anax junius* Drury. Studies were also conducted to assess the effects of hypoxia on hatching success as well as to investigate the role of hypoxia as a possible physiological triggering mechanism for hatching. — At water temperatures of 10-30° C, an environmental pH value of 3.0 was extremely limiting and significantly reduced hatching success. — Over a pH of 3.0-5.0, a water temperature of 30° C was found to be severely limiting. Over a pH range of 6.0-7.0, hatching success was greater than 80% at test temperatures ranging from 10 to 25° C. — Embryos of *A. junius* exhibited a greater tolerance to markedly low environmental pH (3.0) than that previously reported for fish and amphibians, although survival capacity was less than 10%. — An environmental pH value of 3.0 has a significant detrimental effect on embryonic development. Survivorship and developmental rate increase significantly over a pH range of 4.0-5.0. — Oxygen consumption rates were lowest for fertilized eggs exposed to a pH of 3.0 at all test temperatures (10-30° C). Metabolic rates increased significantly at pH 4.0. — Embryos hatch successfully under hypoxic conditions in both aqueous and nonaqueous media. Results suggest that hypoxia acts as triggering mechanism for hatching in this aquatic insect.
- (6615) REEVES, D.M., 1988. Dragonflies (Odonata). In: G. Scott, [Ed.], *Lake Broadwater: the natural history of an inland lake and its environs*, pp. 170-179, 3 pls incl. Darling Downs Institute Press, Toowoomba. — (G.P.O. Box 1220, Brisbane, Qld 4001, AU).
A general account directed at the general reader, describing the fauna (18 spp.) of the lake, southeastern Queensland, Australia. It is considered depauperate, and all spp. recorded are common E of the Great Dividing Range. Because of the periodical drying up of the lake, its odon. fauna is not autochthonous. The tentative breeding sites are described.
- (6616) RIEDEL, W., 1988. Zum Vorkommen einiger Wirbelloser im Bannwald Eisenbachhain (Schönbuch). *Jh. Ges. Naturk. Württ.* 143: 211-215. — (Rehstr. 6, D-7032 Sindelfingen, FRG).
4 odon. spp., incl. *Calopteryx virgo*, are reported from Eisenbachhain, SW of Stuttgart, FRG.
- (6617) RINNE, J.N., 1988. Effects of livestock grazing enclosure on aquatic macroinvertebrates in a montane stream, New Mexico. *Great Lakes Naturalist* 48(2) 146-153. — (USDA Forest Serv., Rocky Mountain Forest & Range Exp. Stn, Forestry Sci. Lab., Arizona St. Univ., Tempe, Arizona 85287-1304, USA).
Aquatic macroinvertebrate populations inhabiting reaches of a stream (Rio de Las Vacas, San Pedro Parks Wilderness Area, Santa Fe Natn Forest, Sandoval Co., New Mexico, USA; alt. 2600 m) within areas excluded from livestock grazing for a decade were markedly different from those in grazed areas when density, biomass, biotic condition indices, and

mean chi square indices of the 2 populations were compared. Increased densities and biomasses of more tolerant forms of macroinvertebrates were observed in grazed reaches. Because pretreatment data were not available, differences in macroinvertebrate populations and relative tolerances of taxa in grazed and ungrazed areas could be as easily attributed to linear changes in stream habitat as to removal of domestic livestock. Results of this study have implications for the design of future research on the effects of livestock grazing on stream environments and biota: (1) baseline/pretreatment information is prerequisite, and (2) the study should take a watershed (ecosystem) approach. — As far as the odon. are concerned, in the present study *Ophiogomphus* sp. was considered only. Its biomass in the ungrazed area was 2.4-4.3 times lower than in the grazed reaches.

- (6618) ROCKWOOD, J.P., R.A. COLER & C.-M. YIN, 1988. The effect of aluminum in soft water at low pH on osmoregulation and ionic balance in the dragonfly *Libellula julia* Uhler. *Comp. Biochem. Physiol. (C)* 91(2): 499-502. — Dept Environ. Sci., Univ. Massachusetts, Amherst, MA 01003, USA).

To determine the physiological impact of Al on an organism stressed by low pH, the acid tolerant *L. julia* was exposed to 30 mg/l Al at a pH of 2.3, 0.3 of a pH unit above its 96 hr LC₅₀. — Aluminum at low pH, in comparison to low pH alone, caused highly significant losses of wet and ash weight and of body burdens of Na⁺ and Ca²⁺. — Since at the test pH Al exists as the ion, it would seem that a biological impact can be exerted not only by the ionized and unionized hydroxides, but also by Al³⁺.

- (6619) SAMWAYS, M.J. & P. CALDWELL, 1988. Glistening wings. *Quagga* 23: 20-21. — (Dept Zool. & Ent., Univ. Natal, P.O. Box 375, Pietermaritzburg-3200, RSA). This is the first paper recorded by the OA that was published on the African Continent (journal of the Endangered Wildlife Trust, Johannesburg), dealing exclusively with conservation of African dragonflies. It is based on the experience gained during the work on a

Univ. of Natal research project in the Drakensberg area. This is essentially a farming land, and it is emphasised that there is no clash of interests between farming activities and local dragonfly conservation. Particularly at middle altitudes (800-1200 m) farm dams represent important "dragonfly reserves"; 78% of all spp. were recorded from these only. Extrapolating from the evidence on butterfly population genetics, the policy of dotting the landscape with these small ponds is advocated. The fragmentation of habitats allows at least some populations to survive when others are crashed due to inclement (usually climatic) conditions.

- (6620) SANT, G.J. & T.R. NEW, 1988. The biology and conservation of *Hemiphlebia mirabilis* Selys (Odonata, Hemiphlebiidae) in southern Victoria. *Techn. Rep. Arthur Rylah Inst. environ. Res.* 82: V+35 pp. — ISSN 0810-5774. — (Dept Zool., La Trobe Univ., Bundoora, Victoria 3083, AU).

The rare and taxonomically-isolated Australian *H. mirabilis* is known to exist only at several small sites in Wilsons Promontory National Park, southern Victoria. This report is a preliminary account of its biology, life history and habitats, and includes information used to assess measures needed for the conservation of this vulnerable spp. Known habitats (seasonally flooding heathland swamps) are characterised; they are vulnerable both to bushfires and to cattle grazing. — *H. mirabilis* is univoltine, with the adults flying in mid to late summer. Aspects of the unique adult display, which involves abdominal movements and extension of apical abdominal appendages, are described. Figures to aid recognition of adults, and measurements, figures, and diagnostic notes on later instar larvae, are given. Larval behaviour is briefly described. — Recommendations are made to aid conservation of *Hemiphlebia*, and include measures to exclude cattle, reduce the risk of fire in the habitat, habitat improvement, and further investigation to determine whether or not it occurs elsewhere on Wilsons Promontory.

- (6621) SILSBY, R.S., 1988. The British Dragonfly

Society. *Bull. amat. Ent. Soc.* 47(361): 221-222. — (1 Haydn Ave., Purley, Surrey, CR2 4AG, UK).

Informative note on the Society, its objectives, membership status (over 500) and on its semi-annual journal.

- (6622) SIOJA. [Information Bulletin of the SIO National Office in Japan], Osaka, 1988, No. 2 (Dec. 4). (Jap.). — (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA). A small issue, opening the discussion on the possibility that the 13th Int. Symp. Odonatol. (1995) would be convened in Japan.
- (6623) [STREHL, J.M.L.], 1988. Lohmann fordert besseren Biotop-Schutz: Städtischer Schutzschild für Libellen-Kolonie. *Südkurier* 44(171): 15, 19 (issue of July 27). — (Hilariusstr. 8, D-7880 Bad Säckingen, FRG). Regional daily's interview with the odonatologist and local District Council Member, H. Lohman (Ziegelackerweg 1, D-788 Rheinfelden, FRG), relative to the conservation measures and management needed for the gravel pit "Weberalten" (cf. *OA* 6575) and the ditch "Sandgrubengraben" (cf. *OA* 6576), both of which harbour appreciable standing populations of a number of locally important "Red list" odon. spp. Lohmann's portrait is also included.
- (6624) *TOMBO. ACTA ODONATOLOGICA*. Published by the Society of Odonatology, Tokyo. Vol. 31, Nos 1/4 (Dec. 25, 1988). (c/o Dr S. Asahina, Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
Eda, S.: A male of *Leucorrhinia dubia* orientalis carrying four parasitic midges, *Pterobosca nipponica* on the wings (frontispiece phot.); — *Asahina, S.*: Notes on some Asiatic dragonflies in the collection of MCZ, Harvard University (pp. 2-8; contains description of *Indocypha silvergliedi* sp. n. from Laos); — A list of the Odonata from Thailand. Part XIX, Libellulidae-I (pp. 9-26); — A problematical race of *Planaeschna ishigakiana* from Amami-Oshima, Middle Ryukyus (pp. 27-34; description of *P. i. nagaminei* ssp. n.); *Lien, J. C. & K. Matsuki*: Description of the larva of *Cratilla lineata assidua* Lieftinck from Taiwan (Libellulidae; Odonata) (pp. 35-36); — *Matsuki, K.*: Description of the larva of *Tetracanthagyna waterhousei* (McLachlan) from Hongkong and Thailand (Aeshnidae; Odonata) (pp. 37-40); — *Matsuki, K. & J. C. Lien*: On a collection of the protonurid damselfly from Taiwan (p. 40); — *Inoue, K. & T. Murakami*: On a dark striped male of *Sympetrum e. eroticum* (pp. 41-42); — *Inoue, K.*: A faunistical record of dragonflies of Ohshima, Ehime prefecture (pp. 42-44); — *Inoue, K. & M. Aiura*: Distribution records of dragonflies of Tsushima Island, Nagasaki Prefecture. Part I (pp. 44-46); — *Inoue, K.*: A small observation record on dragonflies in crepuscular hours (pp. 46-47); — *Sonehara, I.*: *Aeschna mixta* soneharai visiting my garden pond (p. 48); — *Matsumoto, M.*: A revised record of *Aeschna nigroflava* Martin from Saitama Prefecture (p. 48); — *Watanabe, K.*: Mesepisternal colour pattern in male *Coelicia ryukyuensis* (Platycnemididae) (p. 49-52); — Capture of *Stylogomphus ryukyuensis* in Tokonoshima Island (p. 52); — *Arai, K.*: Observations on the larval life of *Planaeschna milnei* (Selys) (pp. 53-56); — *Suzuki, K.*: Invasion of dragonflies into reclaimed land Koshino-kata, Shiniminato City, Toyama Prefecture (pp. 57-58); — *Sugimura, M. & H. Sugimura*: Some individual variation among Japanese dragonflies (pp. 59-60); — *Sugimura, M., N. Yamazaki & H. Sugimura*: Distributional records of some dragonflies in Shikoku and Kyushu (pp. 60-61); — *Eda, S.*: Number of ommatidia of a compound eye of *Anotogaster sieboldii* Selys (pp. 62-63); Annual meeting of the Society of Odonatology Tokyo, 1988 (p. 64); — *Inoue, K.*: Informations on the International Odonatological Society, S.I.O. (p. 65); — Tenth International Symposium of Odonatology (p. 65).
- (6625) TYAGI, B.L., 1988. Biography [of F.C. Fraser]. *Occ. Publs SIO natn. Office India* 3, pp. iii-v, with portrait. — (G-193, Shastri Nagar, Jodhpur-342003, India).
 The text is partly based on the biography by S.C.S. Brown (1963, *Ent. mon. Mag.* 99: 96, pl. 3 excl.), while some information is derived from the author's conversations and/or corres-

pondence with various odonatologists (notably Drs R.M. Gambles and E. Pinhey), who knew the late Dr Fraser in person. — Cf. *OA* 6610.

- (6626) UEDA, T., 1988. Diversity in the life history of the dragonfly *Sympetrum frequens* (Odonata: Insecta). *Bull. Ishikawa agric. Coll.* 18: 98-110. (Jap., with Engl. s.). — (Lab. Nat. Sci., Ishikawa Agric. Coll., Suematsu, Nonoichi-machi, Ishikawa Pref., 921, JA).
S. frequens has 3 different types of life history pattern: (1) In Hokkaido populations, highland type individuals, and the autumn emerging individuals of lowland populations, neither reproductive diapause nor the migration to highlands occur; — (2) A part of the mid-summer emerging individuals of lowland populations usually migrate to highlands, but do not enter reproductive diapause; in unusually cool summers they remain in the lowlands and breed there in mid-summer; — (3) In early summer emerging individuals of lowland populations both reproductive diapause and migration to highlands occur. — The life history pattern in which reproductive diapause takes place but no migration to highlands (known in *Lestes sponsa* in southern Japan) has not been found in *S. frequens*.
- (6627) WATANABE, M. & N. OHSAWA, 1988. Diurnal behaviour of a white-legged damselfly, *Platycnemis ochigoana*. *Insectarium* 25(9): 296-300. (Jap., with Engl. title & fig. captions). — (Dept. Biol., Fac. Educ., Mie Univ., Kamihama, Tsu-shi, Mie 514, JA).
 [Abstract not available].

1989

- (6628) BAUERFEIND, R. & H. KOMNICK, 1989. Intestinal absorption of defined lipids by the larval dragonfly *Aeshna cyanea* (Insecta: Odonata): free and esterified saturated fatty acids. *J. Insect Physiol.* 35(2): 155-164. — Inst. Cytol., Univ. Bonn, Ulrich-Haberland-Str. 61a, D-5300 Bonn-1, FRG).
 A total of 37 free and esterified fatty acids comprising 17 even- and odd-numbered saturates with chain lengths of C4-C22 were tested for their intestinal absorption by larval *A. cyanea*, using the accumulation of lipid droplets in the midgut epithelium as a criterion for absorption. — (1) Short-chain saturates (C < 8) were more or less destructive to the midgut epithelium and did not lead to the formation and accumulation of lipid droplets. However, biochemical examinations after tricaproin ingestion revealed a time-dependent increase in the free fatty acid content of the midgut epithelium indicating that short-chain triglycerides were absorbed in the form of free fatty acids but did not lead to marked triglyceride synthesis in the absorptive cells. — (2) Individually and locally variable accumulations of lipid droplets were observed with even- and odd-numbered medium-chain C8 to C15 saturates regardless of whether they were administered as free or esterified fatty acids and regardless of their fluid or solid states. Examinations with thin-layer chromatography of experiments using esterified lauric acid revealed that glyceryl and ethyl esters were slowly hydrolysed in the midgut lumen and suggested that free fatty acid was the main absorbate, whereas the lipid droplets in the midgut epithelium predominantly consisted of triglyceride synthesized by the enterocytes from the absorbate. — (3) Absorption of long-chain saturates (C > 15) including palmitic acid which is the predominant saturated fatty acid of the natural diet remains questionable, because the epithelial lipid droplets, if present at all, were not markedly different from those also observed in starving controls. The results suggested that the absorption of saturates as assessed by the appearance of lipid droplets in the enterocytes is markedly inferior to the ready absorption of mono- and polyunsaturates previously demonstrated. They further suggest that *A. cyanea* has a preference and two varied mechanisms for the absorption of short- and medium-chain saturates which, according to the literature, are only minor food and body constituents of insectivorous aquatic insects.
- (6629) DIDION, A. & K. HANDKE, 1989. Zum Einfluss der Nutzung und Grösse von Weihern und Teichen im Saarbrücker Raum auf die Artenvielfalt der Libellen. *Natur Landsch.*

- 64(1): 14-17. — (First Author: Marienstr. 23, D-6650 Homburg-6, FRG). 130 ponds, classed into 5 ecological types, were analysed from the point of view of the odon. fauna (37 spp.) they harbour. The number of spp. increases with increasing pond surface and with decreasing human interference.
- (6630) LINDENIA. Notiziario dell'Ufficio Nazionale Italiano della Società Odonatologica Internazionale, Roma. No. 11 (Jan. 1, 1989). — (c/o Prof. Dr. C. Utzeri, Dipt. Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma). In addition to a few administrative items, the issue contains an article on a Japanese dragonfly tying by *C.Utzeri* (Libellule armate pp. 47-48; cf. also *OA* 6462), abstracts of the current Italian faunistic literature, and book reviews of the titles listed in *OA* 6357, 6459.
- (6631) SCHWALLER, T., 1989. Beobachtungen an einer vorübergehenden Population von *Lestes barbarus* (Fabricius) bei Derendingen, Bezirk Wasseramt, Kanton Solothurn, Schweiz (Odonata: Lestidae). *Opusc. zool. flumin.* 38: 1. — (With Engl. s.). — (Zool. Inst. Bern, Baltzerstr. 3, CH-3012 Bern). This Mediterranean sp. occurs in Switzerland as a migrant or a temporary breeding guest only. During 25-30 Sept. 1985, a single, old, worn-winged, apparently immigrant ♀ was regularly seen ovipositing in a locality at a Nature Reserve near Derendingen. In 1986, the adult offspring of this individual consisted of at least 8 ♀ and 3 ♂, but in 1987 only 2 ♂ could be marked, while the population had completely disappeared in 1988. The development of the population and habits of some of its individuals are described with emphasis on reproductive activities and the oviposition substrate selection. The decline and the extinction of the population are tentatively ascribed to chalcid egg infestation, desiccation of eggs and to the probability of eggs remaining unfertilized.
- (6632) SELYSIA. Newsletter of the Societas Internationalis Odonatologica and the U.S. National Office, Vol. 18, No. 1 (March 1, 1989). — (c/o D.M. Johnson, Dept Biol. Sci., East Tennessee St. Univ., Box 23580 A, Johnson City, TN 37614-0002, USA). *Johnson, D.M.*: X International Symposium of Odonatology (p. 1); — *Corbet, P.S.*: Plenary Seminar: X International Symposium of Odonatology (p. 1); — *Dunkle, S.W.*: Spurs on Odonata legs (p. 1); — *Kiauta, B.*: Locations for future Symposia announced (p. 2); — *Corbet, P.S.*: Reprints of recent works requested (p. 2); — *Hare, L.*: Breakout", a poem with larval emphasis (p. 2); — *Dunkle, S.W.*: Neotropical odonatologist's meeting (p. 3); — *Bick, G. & J. Bick*: Cora study (p. 3); — *Inoue, K.*: Dr Obana, Mnais scholar, dies (p. 3); — [*Johnson, D.M.*]: Other recent deaths (p. 3); — *May, M.L., P.S. Corbet & J.-G. Pilon*: Report to S.I.O. membership [of the Working Group to define the responsibilities of the Secretary of the S.I.O.] (p. 4); — *Calabrese, D.M.*: Women in entomology (p. 4).
- (6633) SIVA-JOTHY, M.T. & Y. TSUBAKI, 1989. Variation in copulation duration in *Mnais pruinosa* Selys (Odonata: Calopterygidae). 1. Alternative mate-securing tactics and sperm precedence. *Behav. Ecol. Sociobiol.* 24(1): 39-45. — (First Author: Dept Biol., Medawar Bldg, Univ. Coll., Gower St., London, WC1E 6BT, UK). Males of *M. p. pruinosa* were observed to use 3 different tactics to secure mates. The mean duration of copulation differed between the 3 observed tactics and resulted in varying degrees of sperm removal and insemination. It is shown that the last male to mate had almost 100% sperm precedence immediately after copulation regardless of the duration of copulation and therefore the quantity of sperm removed. In situations where less than 100% of rivals sperm was removed the sperm from different males mixed within the female sperm storage organs over a period of about 6 days: sperm mixing produced variation in last male sperm precedence. The significance of sperm mixing in *M. p. pruinosa* is discussed in the context of the observed mate-securing tactics and the frequent female habit (37% of observations) of ovipositing without remating during an oviposition bout.

- (6634) UTZERI, C., 1989. Tactile communication through the tandem link in the Odonata and the problem of tandem oviposition in *Sympetrum* (Libellulidae). *Opusc. zool. flumin.* 35: 1-6. — (Dipt. Biol. Anim. & dell'Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
 Reports of *Sympetrum* males making oviposition movements with dead females suggest autonomous oviposition behaviour of the male sex. Nevertheless, on the basis of literature reports and unpublished observations it is stressed that a female-to-male communication occurs in dragonflies, which probably releases the tandem male swaying during oviposition.
- (6635) UTZERI, C. & G. GIANANDREA, 1989. Perching in the shade: a thermoregulatory behaviour in some aeshnid dragonflies? (Odonata: Aeshnidae). *Opusc. zool. flumin.* 35: 7-8. — (Dipt. Biol. Anim. & dell'Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
 On the completely barren and waterless islet of Il Catalano, 11 km W of Sardinia, Italy, *Aeshna mixta* Latr., *Anax imperator* Leach and *A. parthenope* Sel. were seen during the noon hrs of 2 exceptionally hot days to persistently perch in the shade of the rocky walls. While in the breeding habitat thermoregulatory shade-seeking is unlikely to occur in dragonflies, it is hypothesised that under the exceptional environmental conditions prevailing on that rocky island, the incidental
- strugglers may adopt perching in the shade as thermoregulatory strategy.
- (6636) WOLF, L.L., E.C. WALTZ, K. WAKÉLEY & D. KLOCKOWSKI, 1989. Copulation duration and sperm competition in white-faced dragonflies (*Leucorrhinia intacta*; Odonata: Libellulidae). *Behav. Ecol. Sociobiol.* 24: 63-68. — (Dept Biol., Syracuse Univ., Syracuse, NY 13244-1270, USA).
 In many odon., females mate with more than 1 male while laying a single clutch of eggs. The paternity of eggs laid by remated females of *L. intacta* was studied at a pond nr Syracuse, NY, USA. The probability of a female remating is a function of male density on the pond. The length of copulations differs considerably among males active on the study pond at the same time. Much of this variation was correlated with differences in mating tactics of the males: copulations by males that stayed on their territories during copulation were shorter than those by other males. Eggs collected from females mated to irradiated, sterile males and to free-living, fertile males indicated that the average paternity expectation was higher for long than for short copulations, and that the variance in paternity expectation was lower for long than for short copulations. Some possible causes of the high variation in paternity at low copulation durations and possible reasons for differences in copulation duration between male mating tactics are discussed.