

## ODONATOLOGICAL ABSTRACTS

### 1971

- (4124) MIELEWCZYK, S., 1971. [Przegląd piśmiennictwa — Bibliographie]. D. St.-Quentin, M. Beier, Odonata (Libellen) [...] Handbuch der Zoologie [...], 1968. *Pol. Pis. ent.* 41 (1): 232-233. (Polish). — (Abt. Agro- u. Forstbiol., Poln. Akad. Wiss., Swierczewskiego 19, PO-60-809 Poznan).  
Informative book review.

### 1975

- (4125) STROUHAL, H. & J. VORNATSCHER, 1975. Katalog der rezenten Höhlentiere Österreichs. *Annln naturh. Mus. Wien.* 79: 401-542. — (Second Author: Landstrasser Hauptstr. 95, A-1030 Wien-3).  
The organization of the catalogue follows that of B. Wolf's *Animalium cavernarum catalogus* (1934-1938, Junk, The Hague), but the taxonomic index is omitted. *Lestes viridis*, recorded from the Eggerloch nr Warmbad Villach (Carinthia), is the only odon. sp. listed (p. 533). The reference is based on F. Strouhal's papers in *Folia zool. hydrobiol.* 9 (1939): 247-290, and in *Arch. Naturg.* (N.F.) 9 (1940): 372-434.

### 1976

- (4126) GRIFFITHS, W.E., 1976. Food and feeding habits of European Perch in the Selwyn River, Canterbury, New Zealand. *J. Mar. Freshw. Res.* 10 (3): 417-428. — (Fish & Wildlife Div.,

Longman Bldg, 6909-116 Str., Edmonton, Alberta, T6H 4PN, CA).

Although fairly large numbers of Zygoptera were taken in summer, their nutritional value was minimal compared with that of bullies and smelt. Their presence in the summer diet would tend to support the premise that the exposure of the prey to the predator is the most important factor controlling food intake. *Xanthocnemis zealandica* may be more exposed to predation at this time, when they are moving up weed stalks and willow roots to emerge.

- (4127) STARMÜHLNER, F., 1976. Contribution to the knowledge of the freshwater-fauna of the Isle of Anjouan (Comores). *Cah. O.R.S.T.O.M.* (Hydrob.) 10 (4): 255-265. (With Fr. s.). — (I. Zool. Inst., Univ. Wien, Wien, Austria).  
The ecology and fauna of the torrents of the Anjouan Island (surface 424 km<sup>2</sup>), Comores Archipelago, western Indian Ocean were studied. The odon. spp. reported are: *Pseudagrion pontogenes*, *Orthetrum julia falsum*, *Trithemis arteriosa*, *T. kirbyi ardens*, and *Zygonyx torrida*.

- (4128) WINYASOPIT, J., 1976. *Studies on biology and the efficiency of dragonfly and damselfly naiads in the control of mosquito larvae (Culex pipiens quinquefasciatus Say)*. M. Sc. thesis, Fac. Agric., Kasetsart Univ., Bangkok. VI+66 pp. (Thai, with Engl. s.). — (Author's address unknown).  
The biology of *Crocotthemis servilia* and *Caconeura* sp. was studied in the laboratory.

In the former, the egg and larval development (12 molts) lasted resp. 18-45 and 70-78 days; in the latter, the required times were resp. 6-15 and 43-48 days (8 molts). The adult longevity of *C. servilia* was 11-17 days in the female, and 5-9 days in the male. In *Caconeura* sp. these values amounted to resp. 6-9 and 5-7 days. — The larva of *C. servilia* consumed  $2299 \pm 25.58$  mosquito larvae, and that of *Caconeura* sp.  $385 \pm 10.31$  midges. A 5th instar *Crocothemis* and a 3rd instar *Canoneura*, kept in the same jar for 21-27 days, consumed during this period  $927 \pm 19.95$  mosquito larvae. — It was also noticed that these 2 odon. spp. are tolerant to organic pollution of water. (Author).

## 1979

- (4129) CHANTHACHUME, K., 1979. *Survey of dragonfly [sic!] from certain parts of Thailand*. M. Sc. thesis, Fac. Trop. Med., Mahidol Univ., Bangkok. XII+180 pp., 26 col. pls incl. — (Dept Parasitol., Chulalongkorn Hospital Med. Sch., Bangkok, Thailand).  
A survey is given of 29 anisopteran spp., collected in 30 provinces (paddy fields and uncultivated habitats) of central and eastern Thailand (Gomphidae, Aeshnidae, Corduliidae, Libellulidae). All spp. (incl. the larval stage of 11 of them) are described in detail and keyed, their ecology is discussed, and special reference is made to their importance as intermediate trematode hosts and as vectors of mosquito control. For some spp., quantitative data on their predatory efficiency (*Culex quinquefasciatus*) are also presented.
- (4130) ŁAKOMIEC, L., 1979. Potencjalna rola ważek różnoskrzydłych (Anisoptera) w ogniskowo-kompleksowej metodzie ochrony lasu — Potentielle Rolle der Libellen aus der Unterordnung Anisoptera in der Herd-Komplex-Fortschutzmethode. *Pr. Inst. badaw. Lesń.* 554: 99-106. (Pol., with Russ. & Germ. s's.). — (Inst. Zool., Univ. Warszaw, PO).  
The role of the Anisoptera in the pinewood community is discussed.

- (4131) ROBB, J., 1979. Some distinctive native animals. In: P.J. Brook, [Ed.], *Natural history of Auckland: an introduction*, pp. 65-69, Handb. War Memorial Mus., Auckland. — (Zool. Dept Univ. Auckland, Auckland, NZ). The frog *Leiopelma hochstetteri* is noted as often found in the holes or tunnels made in wet clay by dragonfly larvae. — (*Abstracter's Note*: This refers to *Uropetala carovei*; cf. *OA* No. 2857).

## 1980

- (4132) PRASAD, M. & A. KUMAR, 1980. [published 1981]. Paścimī Himālaya ke vyādha-patamgaum kā niṛkśana. — [Survey of the Odonata of western Himalaya]. *Prāni Jagat* 1: 69-81. (Hindi). — (First Author: Zool. Surv. India, 14 Madan Str., Calcutta-700072, India).  
A brief review, listing 85 spp. — (*Abstracter's Note*: This is the first Hindi odonatology publication ever recorded by the SIO Abstracting Service. It is interesting that the taxonomic names are given in devanagari transliteration, and the same is true of the bibliographic references, where the original Latin script is transliterated into devanagari rather than the titles being translated into Hindi).

## 1981

- (4133) AKABANE, S., 1981. [Sympetrum flaveolum]. *Nature & Insects* 16 (7): frontispiece photograph. — (Author's address not stated).  
Photograph taken at Shiretoko-goko Lake, Hokkaido, Japan, August 1979.
- (4134) CHOWDHURY, S.H. & M. AKHTERUZ-ZAMAN, 1981. Dragonfly (Odonata: Anisoptera) larvae from Chittagong. *Bangladesh J. Zool.* 9 (2):131-144. — (First Author: Dept Zool., Univ. Chittagong, Chittagong, Bangladesh).  
Larvae of 13 spp. were collected and reared in the laboratory. A description of these is given and notes on their distribution and ecology are

added. A key based on morphological characters was constructed for field identification. The spp. concerned are: *Ictinogomphus rapax*, *Brachydiplax* sp., *Brachythemis contaminata*, *Diplacodes trivialis*, *Hydrobasileus* sp., *Orthetrum sabina*, *O. t. testaceum*, *Pantala flavescens*, *Rhodothemis rufa*, *Rhyothemis v. variegata*, *Tholymis tillarga*, *Urothemis s. signata*, and *Zyxomma petiolatum*.

- (4135) COOKSEY, L.M. & H.E. BARTON, 1981. Flying insect populations as sampled by malaise trap on Crowleys Ridge in northeast Arkansas. *Proc. Ark. Acad. Sci.* 35 (0): 29-32. — (Dept Biol. Sci., Arkansas St. Univ., State University, Ark. 72467, USA).  
10,830 insect spec. (9 orders) were collected during 12 weeks (May, July, Sept.). The odon. (all Coenagrionidae) amounted to 0.02, 0.03 and 0.19% of the total catches in the respective months. Specific names are not stated.
- (4136) DILLON, P.M., 1981. *Community dynamics in odonates: interactions within and between life stages*. PhD thesis Univ. Michigan, Ann Arbor. 177 pp. — (Last known author's address: Div. Biol. Sci., Univ. Michigan, Ann Arbor, Mich. 48109, USA). — Microfilm or xerox available at University Microfilms International, Dissertation Copies, P.O.B. 1764, Ann Arbor, Mich. 48106, USA; refer to Order No. DA 8204637).  
[Verbatim, from *Diss. Abstr.* 42,9 (1982): 3558-B]: Factors influencing the coexistence of ecologically similar dragonfly species were investigated including: (1) timing of emergence and adult flight season, (2) territorial interactions among males, and (3) potential interactions among larvae. — Because females did not oviposit in their mates' territories, territory quality in terms of oviposition site does not appear to be important in the libellulid dragonflies studied: *Leucorrhinia intacta* Say and *Sympetrum internum* Montg. Male aggressive behavior maximizes access to females by maintaining a clear flight path and minimizing interference from conspecific males. — *L. intacta* larvae showed a significant preference for large (10 mm) rather small (5 mm) chironomid larvae. Preference tests
- utilizing damselfly larvae, tadpoles, amphipods, and chironomid larvae as prey indicated that handling time may be most important in determining prey choice. Mechanical and/or chemical defenses are effective deterrents to larval predation as shown by larval avoidance of chironomid larvae with gelatinous cases. — Movement patterns describe one facet of the impact of larvae on the littoral community. Marked libellulid larvae (sit-and-wait predators) moved an average of 50 cm/da whereas aeshnid larvae (active stalkers) moved an average of 65 cm/da. — Patterns of emergence appear tied to fluctuations in local conditions. Three emergence groups of odonates can be distinguished: spring dragonfly, midsummer damselfly, and late summer dragonfly species. These groups may arise as the result of competition between larvae of dragonflies and damselflies for food such that overlap of competing size classes is minimized.
- (4137) EDA, S., 1981. [Three cases of triple connection in *Leucorrhinia dubia orientalis*]. *Nature & Insects* 16 (14): 16. (Jap.) — (3-4-25 Sawamura, Matsumoto, Nagano Pref., 390, JA).  
All 3 cases are referable to the A type (♂-♂-♀). They were noticed at the Ushidome-ike Pond, Nagano Pref. (July 26, 1981) and are here briefly described.
- (4138) EDA, S., 1981. [An excessive brown marking in the wing of *Sympetrum baccha matutinum*]. *Nature & Insects* 16 (14): 21. (Jap.) — (3-4-25 Sawamura, Matsumoto, Nagano Pref., 390, JA).  
A female, with an abnormal additional spot in the nodal region of the left hind wing is described and illustrated (Kiso-mura, Nagano Pref., Aug. 14, 1981).
- (4139) EDA, S., 1981. [Dragonflies on stamps in the world, fourth report]. *Nature & Insects* 16 (14): 21. (Jap.) — (3-4-25 Sawamura, Matsumoto, Nagano Pref., 390, JA).  
Two 1981 postage stamps from Botswana (*Anax imperator*) and Lesotho (Malachite Kingfisher, with *Nesciothemis farinosum*) are reproduced and described. (For the earlier pts

in this series cf. *OA* No. 3420).

- (4140) FUJISAWA, S., 1981. [Eophthalmia elegans and Anisogomphus maacki new to the fauna of Shiga Heights]. *Nature & Insects* 16 (14): 13 (Jap.). — (1986, Iiyama, Iiyama, Nagano Pref., 389-22, JA).  
The 2 spp. were taken on resp. July 23 and 31, 1980 and Aug. 1, 1981. This brings the status of the Shiga Heights odon. fauna up to 37 spp. (For a book on the subject, by the same author, cf. *OA* No. 3087).
- (4141) ILLIES, J., 1981. *Adolf Portmann. Ein Biologe vor dem Geheimnis des Lebendigen*. Herderbücherei, Bd 873, 272 pp. Kindler München & Herder, Freiburg-Basel-Wien. (ISBN 3-451-07873-2). — Price: sFr 9.90. — (Author deceased).  
This is a biography of the great Swiss zoologist and philosopher (for biographic data and obituaries cf. *OA* No. 4071), by one of the most illustrious contemporary German zoologists. Background information on Portmann's famous Ph. D. work, "Die Odonaten der Umgebung von Basel. Beitrag zur biologischen Systematik der mitteleuropäischen Libellen" (1921) is given on pp. 50-54. This theme was Portmann's "second choice", worked out in consultation with F. Ris, and under the influence of C. Wesenberg-Lund. Its actual scope is the "comparative and phylogenetic ethology" of the Central European Odonata, as developed later by K. Lorenz (in ducks) and by W. Wickler (in fishes). It represents a milestone and one of the classical works in odonatology. Unfortunately, due to the rather obscure mode of publication and, above all, due to its being published in the German language, it largely remained unnoticed by both the contemporary and the modern Anglosaxon odonate behaviourists. — (*Abstracter's Note*: Copies of Portmann's dissertation are most likely still available from the University of Basel).
- (4142) KUWATA, K., 1981. On aquatic insects in Ehime Prefecture. *Nature & Insects* 16 (8): 13-14. (Jap., with Engl. title). — (579-1 Higashi-ishii-machi, Matsuyama, Ehime Pref., 790, JA).  
Among the different aquatic insect orders, the Odon. are considered a good indicator for the state of the habitat. While *Onychogomphus viridicostus*, *Libellula quadrimaculata* asahinai and *Sympetrum uniforme* are rather resistant, *Calopteryx atrata* and *Mnais p. pruinosa* are sensitive to environmental changes.
- (4143) NARAOKA, H., 1981. [Abdomen movement in coenagrionids]. *Nature & Insects* 16 (7): 34. (Jap.). — (36-71, Aza Motoizumi, Oaza Fukunoda, Itayanagi-cho, Kita-gun, Aomori Pref., 038-36, JA).  
Abdominal bobbing movements are recorded in *Cercion calamorum*, *S. sieboldii*, *C. hieroglyphicum*, *C. plagiosum* and *Lestes sponsa*. Abdominal movements of some other nature were also noticed, and the subject is briefly discussed.
- (4144) PRASAD, M. & R.K. THAKUR, 1981. Further additions to the odonate (Insecta) fauna of Rajasthan. *Jantu* 1: 26-28. — (First Author: Zool. Surv. India, 14 Madan Str., Calcutta-700072, India; — Second Author: Desert Reg. Stn, Zool. Surv. India, Jodhpur-342006, India).  
Annotated list of 16 spp., all new to the fauna of Rajasthan. *Diplacodes levebvrei* has not been previously reported from NW India.
- (4145) SHIRAIISHI, K., 1981. [Observations on two dragonfly species in Okinawa Pref.]. *Nature & Insects* 16 (14): 13. (Jap.). — (1-612 Ikebukuro, Toshima-ku, Tokyo, 170, JA).  
*Brachydiplax chalybea flavovittata* (Nago, Okinawa-honto, Aug. 29, 1981) and *Zyxomma obtusum* (Minami-daito-jima, Aug. 27-28, 1981).
- (4146) SUZUKI, Y., 1981. [Macromia daimoji taken at Noda, Chiba Pref.]. *Nature & Insects* 16 (10): 30-31. (Jap.). — (Noda-kita Senior High Sch., 713, Yatsu, Noda, Chiba Pref., 278, JA).  
2 females (June 24, 1979 and July 29, 1980) are brought on record. The sp. is new to Chiba Pref., Japan.

- (4147) TAKETO, A., 1981. ["Water-tapping" behaviour in *Pantala flavescens* on the car roofs]. *Nature & Insects* 16 (14): 18. (Jap.) — (3-22, Ishibiki 2-chome, Kanazawa, 920, JA).  
A detailed description of this peculiar female behaviour, based on an incidental observation.
- (4148) TAKITA, S., 1981. [Copulation of *Somatochlora arctica*]. *Nature & Insects* 16 (12): 33. (Jap.) — (8-311, Tsukuba Univ., Hirasuna Gakusei Shukusha, 2-1-1, Amakubo, Sakuramura, Niihari-gun, Ibaraki Pref., 300-31, JA).  
A note and a photograph (Akanuma Pond, Hokkaido, Aug. 11, 1979).
- (4149) TAKITA, S., 1981. [An interspecific tandem in *Aeshna*]. *Nature & Insects* 16 (13): 34. (Jap.) — (8-311, Tsukuba Univ., Hirasuna Gakusei Shukusha, 2-1-1, Amakubo, Sakuramura, Niihari-gun, Ibaraki Pref., 300-31, JA).  
A. subarctica ♂ / A. juncea ♀; the attempt at copulation was unsuccessful (Akanuma Pond, Hokkaido, July 25, 1978). The behaviour is described in detail.
- (4150) UDONO, K., 1981. [A new locality of *Mortonagrion hirosei* in Aichi Prefecture]. *Nature & Insects* 16 (9): 31-32. (Jap.) — (Author's new address: A-15, Hozo-shataku of Toho Gas, 2-26, Hozo-cho, Nakagawa-ku, Nagoya, 454, JA).  
A new habitat was discovered (June 10, 1978) at Tobishima-mura, Ama-gun. Since the only other locality of this sp. in the Aichi Prefecture was recently destroyed, this is at present the only habitat of this sp. known in the prefecture.
- 1982**
- (4151) *ADVANCES IN ODONATOLOGY*, Vol. 1. (VI+308 pp.) Dec. 31, 1982. Edited by R.M. Gambles; published by the Societas Internationalis Odonatologica (S.I.O.), Utrecht. — Price: Hfl. 100.- net. — (Orders to: Soc. Int. Odonatol., c/o Dept Anim. Cytogen. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL).  
This is a new series, scheduled to appear at 2-yr intervals. The first volume contains a selection of papers, presented at the Sixth Int. Symp. Odonatol., Chur (Switzerland), 1981 (cf. *OA* No. 3400), viz.: *Gambles, R.M.*: Preface (pp. III-IV); — *Askew, R.R.*: Roosting and resting site selection by coenagrionid damselflies (1-8); — *Cannings, R.A.*: The larvae of the *Tarnetrum* subgenus of *Sympetrum*, with a description of the larva of *Sympetrum nigrocreatum* Calvert (Odonata: Libellulidae) (9-14); — *Crowley, P.H. & D.M. Johnson*: Co-occurrence of Odonata in the eastern United States (15-37); — *De Marmels, J.*: The genus *Euthore Selys* in Venezuela, with special notes on *Euthore fasciata fasciata* (Hagen, 1853) (Zygoptera: Polythoridae) (39-41); — *Dufour, C.*: Odonates menacés en Suisse romande (43-54); — *Gonzalez Soriano, E., R. Novelo Gutierrez & M. Verdugo Garza*: Reproductive behavior of *Palaemema desiderata* Selys (Odonata: Platystictidae) (55-62); — *Herzog, H.-U.*: The effects of various external media on the haemolymph of larval *Aeshna cyanea* (63-68); — *Komnick, H.*: The rectum of larval dragonflies as jet-engine, respirator, fuel depot and ion pump (69-91); — *Komnick, H., J. Bongers & W. Fischer*: Lipid absorption in the midgut of larval *Aeshna cyanea* (93-104); — *Kukulies, J.*: Fine structure and tracer permeability of the cuticle and cell junctions of the rectal chloride epithelia of *Aeshna cyanea* larvae: a comparative freeze-fracture and thin-section study (105-115); — *Masseau, M.J. & J.-G. Pilon*: Action de la température sur le développement embryonnaire de *Enallagma hageni* (Walsh) (Odonata: Coenagrionidae) (117-127); — Etude de la variation intrastade au cours du développement postembryonnaire de *Enallagma hageni* (Walsh) (Zygoptera: Coenagrionidae): facteurs agissant sur la différenciation des types de développement (129-150); — *Mill, P.J.*: A decade of dragonfly neurobiology (151-173); — *Miller, P.L.*: Genital structure, sperm competition and reproduction behaviour in some African libellulid dragonflies (175-192); — *Miyakawa, K.*: Reproductive behaviour and life span of adult *Calopteryx atrata* Selys and *C. virgo japonica* Selys (Odonata: Zygoptera) (193-203); — *Moore, N.W.*: Conservation of Odonata — first steps towards a world

- strategy (205-211); — *Pinhey, E.*: *Platycypha caligata* (Selys) and a new lacustrine morph (Odonata: Chlorocyphidae) (213-225); — *Pritchard, G.*: Life-history strategies in dragonflies and the colonization of North America by the genus *Argia* (Odonata: Coenagrionidae) (227-241); — *Schneider, W.*: Man-induced changes in the dragonfly fauna of the Jordan Valley (243-249); — *Tennessen, K.J.*: Review of reproductive isolating barriers in Odonata (251-265); — *Thompson, D.J.*: Prey density and survival in damselfly larvae: field and laboratory studies (267-280); — *Ueda, T. & M. Iwasaki*: Changes in the survivorship, distribution and movement pattern during the adult life of a damselfly, *Lestes temporalis* (Zygoptera: Odonata) (281-291); — *Watson, J.A.L.*: Dragonflies in the Australian environment: taxonomy, biology and conservation (293-302); — *Winstanley, W.J.*: Observations on the Petaluridae (Odonata) (303-308).
- (4152) **ARNOLD, A.**, 1982. Ablichtung von Insektenflügeln. *Ent. Nachr. Ber.* 26 (6): 284. — (Wildenfelser Str. 34, DDR-9513 Langenbach/Erzg., GDR).  
A method is described for the preparation of contact "photographic" negative prints of insect wings, and *Lestes sponsa* is used as an example.
- (4153) **AŠMERA, J.**, 1982. Přspěvek k výskytu vážky podhorní — *Sympetrum pedemontanum* (Allioni) 1766 v ČSR. — Beitrag zum Hervorkommen der Gebänderten Heidelibellen — *Sympetrum pedemontanum* (Allioni) 1766 in der CSR. *Prirodov. Sb.* 26: 123-125. (Czech, with Germ. s.). — Krajská Hygienská Stanica, Partyzánske nám. 7, CZ-72892 Ostrava).  
The occurrence of *S. pedemontanum* in 5 areas of Moravia, Czechoslovakia is recorded. As evidenced by the 1950-1979 collections, the sp. is more common than supposed earlier.
- (4154) **BENKE, A.C., P.H. CROWLEY & D.M. JOHNSON**, 1982. Interactions among coexisting larval Odonata: an in situ experiment using small enclosures. *Hydrobiologia* 94: 121-130. — (First Author: Sch. Biol., Georgia Inst. Technol., Atlanta, Ga 30332, USA).  
Field experiments, using small replicated enclosures, focused on interactions between larval populations of *Epitheca cynosura* and *Ladona deplanata* — 2 spp. that emerge in early spring. The presence of *Epitheca* reduced the total biomass of *Ladona*, but the latter had no significant effect on the former. These early-emerging spp. reduced the biomass of small instars of late-emerging Anisoptera which colonized enclosures during the experiments, and the late-emerging Anisoptera seem to have inhibited colonization by Zygoptera larvae. Results are consistent with the importance of predatory (cannibalism or mutual predation) interactions in this community. (Authors).
- (4155) **BURMEISTER, E.-G.**, 1982. Die Libellenfauna des Murnauer Mooses in Oberbayern (Insecta, Odonata). *Entomofauna* (Suppl.) 1: 133-184. — (Zool. Staatssammlung, Maria-Ward-Str. 1b, D-8000 München-19, FRG).  
A serious treatment of the fauna of this Bavarian (F.R. Germany) locality, with emphasis on autecology and sociology.
- (4156) **COTTON, D.C.F.**, 1982. *Coenagrion lunulatum* (Charpentier) (Odonata: Coenagrionidae) new to the British Isles. *Ent. Gaz.* 33: 213-214. — (Sch. Sci., Regional Techn. Coll., Sligo, Ireland).  
A specimen from Sligo, Ireland (June 28, 1981; deposited in Brit. Mus.) is placed on record, and its structural features are figured. The habitat is described in detail but, for conservancy's sake, the name of the precise locality is not disclosed.
- (4157) **CROWLEY, P.H. & D.M. JOHNSON**, 1982. Habitat and seasonality as niche axes in an odonate community. *Ecology* 63 (4): 1064-1077. — (First Author: T.H. Morgan Sch. Biol. Sci., Univ. Kentucky, Lexington, Ky 40506, USA).  
This study focuses on the coexistence of the dominant populations among 46 odon. spp. found in Bays Mountain Park, Sullivan Co., Tennessee, USA. By monthly sampling of 6

- aquatic habitats the larval biomass distributions of the 12 dominant populations across habitats and seasons were established, and from these the estimates of distributions along corresponding niche axes were derived. The index proposed by S.H. Hurlbert (1978, *Ecology* 59: 67-77) was used. Three results support the resource-partitioning mechanism, viz. (1) Competition coefficients, obtained by dividing niche overlap values by the appropriate niche specialization values, are all less than one; this indicates that each population should inhibit its own access to a limited food supply more than it inhibits the access of the other populations; — (2) Though little or no complementarity between the habitat and seasonality axes is apparent when single-axis index values are examined, the two-dimensional competition coefficients are slightly smaller on average than the product of single-axis means, suggesting two-dimensional complementarity; — (3) There are about the same number of consistent 3-yr trends in specialization and overlap as would be expected by chance, suggesting a relatively persistent arrangement of odonate niches in niche space. — But the ecological shift mechanism may be operating within or between those populations that do exhibit consistent 3-yr trends in specialization or overlap; more of these values consistently decrease than would be expected by chance. The 6 populations that comprise the detritus-submersed macrophyte guild account for most of the larval biomass, and the dominant population within the guild (and the community as a whole) is the semivoltine anisopteran *Tetragoneura cynosura*. A particularly intense interaction, as indicated by the competition coefficients, is between the abundant zygopterans *Enallagma traviatum* and *E. signatum*: unusually high specializations and overlap were observed for the rush-dwelling zygopterans *Ischnura verticalis* and *I. posita*.
- (4158) DOUTHWAITE, R.J. & C.H. FRY, 1982. Food and feeding behaviour of the little bee-eater *Merops pusillus* in relation to tsetse fly (*Glossina morsitans*) control by insecticides. *Biol. Conserv.* 23 (1): 71-77. (First Author: Cent. Overseas Pest Res., Coll. House, Wrights Lane, London W8 5SJ, UK).
- M. pusillus* feeds close to the ground as a flycatcher, returning to a perch after each feeding attempt. Food remains from 9 localities in west, central and southern Africa showed that the diet in the breeding season consists of a wide variety of insects 4.5-35.0 mm long. A total of 57% were Hymenoptera (mainly Apoidea), and the remainder mostly Coleoptera, Diptera and Odon. Observations in an area sprayed for tsetse fly control suggest that the bird could be used as an indicator of the effects of pesticide applications on day-flying insects.
- (4159) GONZALEZ-SORIANO, E. & M. VERDUGO-GARZA, 1982. Studies on neotropical Odonata: the adult behavior of *Heteragrion alienum* Williamson (Odonata: Megapodagrionidae). *Fol. ent. mex.* 52: 3-15. (With Span. s.). — (Dep. Zool., Inst. Biol., Univ. Nac. Auton. México, Apdo P. 70-153, 04510 México, D.F., México).  
The diurnal activity pattern, movement to and from water, behaviour of single males, and the reproductive activities are described and discussed.
- (4160) HEATH, J.E. & M.S. HEATH, 1982. Energetics of locomotion in endothermic insects. *Ann. Rev. Physiol.* 44: 133-144. — (Dept Physiol. Biophys., Univ. Illinois, Urbana, Ill. 61801, USA).  
A review of the subject. Odon. are among the 7 orders considered.
- (4161) KUMAR, A., 1982. An annotated list of Odonata of Himachal Pradesh. *Indian J. phys. nat. Sci.* (A) 2: 55-59. — (High Altitude Zool. Flt Stn, Zool. Surv. India, Solan-173212, India).  
75 spp. are listed, and their districtwise ranges are stated.
- (4162) LÖSER, S., 1982. Die Landtierwelt des Naturlehrparkes unter besonderer Berücksichtigung der Kleintiere der Bodenoberfläche: eine faunistisch-ökologische Untersuchung (1973, übergearbeitet 1982). *In: Naturlehrpark*

Haus Wildenrath (Eds): Erforschung des Naturlehrparks Haus Wildenrath, pp. 49-106. Rheinland-Verlag, Köln. — (Schiefbahnerstr. 16, D-4051) Korschenbroich-2, FRG).

The paper gives the same odonatol. data as those listed in *OA* No. 4079.

- (4163) MICHAELIS, F.B., 1982. The lakes of Tongariro National Park. *Mauri Ora* 10: 49-65. — (16 Lanoma Str., Launceston, Tasmania-7250, AU).

The physical, chemical and biological features of 12 mountain lakes (alt. 710-2774 m) within the Tongariro National Park, North Island, New Zealand are reviewed. *Xanthocnemis zealandica*, *Hemicordulia australiae*, *Procordulia grayi*, and *Diplacodes bipunctata* were recorded by the author from Lake Rotopounamu. *Austrolestes colenisonis* (noted there in 1971, as given in the Appendix) was not recorded during this survey. The larvae of *X. zealandica* were also abundant in Lake Surprise.

- (4164) MULLA, M.S., H.A. DARWAZEH & L. EDE, 1982. Evaluation of new pyrethroids against immature mosquitoes and their effects on nontarget organisms. *Mosquito News* 42 (4): 583-590. — (Dept. Ent., California Univ., Riverside, Calif. 92521, USA).

Of 5 new pyrethroids tested in the laboratory against immature stages of *Culex quinquefasciatus*, 2 were highly active against larvae (causing 90% mortality at 0.07-0.46 p.p.b.) and 3 were highly active against pupae (90% mortality at 1-4 p.p.b.). Cypermethrin and fenprothrin were tested against larvae and pupae of *C. tarsalis* and *Psorophora columbiae* in the field in California. Against *C. tarsalis* cypermethrin at 3-5 g/ha and fenprothrin at 27-55 g/ha caused 90-100% mortality of larvae. Both compounds were also effective against pupae and against *P. columbiae*. Cypermethrin had no adverse effects on adult dytiscids and was relatively innocuous to ostracods and larvae of Odon. at effective rates for the control of mosquito larvae. However, it reduced larvae of Ephemeroptera to very low levels, and recovery was not noticeable 2 weeks later. Fenprothrin

adversely affected Odon. and Ephemeroptera but had no effects on ostracods except for a short period. The affected organisms recovered in 2 weeks.

- (4165) NICHOLLS, S.P., 1982. *Ion balance and excretion in Libellula quadrimaculata (Odonata: Libellulidae)*. PhD thesis, Univ. Bristol. 217 pp., 36 pls incl. — (Dept Physics, Univ. Bristol, Tyndall Ave., Bristol, BS8 1TL, UK). Ionic regulation of the larvae of *L. quadrimaculata* was investigated by adapting animals to media of differing composition. Although ionic regulation in this species is well developed, a large part of their ability to survive in diverse conditions resides in their tolerance to large changes in haemolymph ion concentrations. In saline media, haemolymph concentrations of sodium and chloride are kept below those of the external medium, whilst haemolymph osmotic pressure remains close to or above that of the external medium. This is achieved by active regulation of the non-ionic fraction of the haemolymph, and serves to reduce the need to drink the external medium. — The functioning of the Malpighian tubules in vitro from normal, salt-water and de-ionized water adapted animals was also investigated. The results are discussed both in terms of the phylogenetic position of the Odonata, and of the physiological requirements of an aquatic insect. — The morphology and fine structure of the Malpighian tubules and hindgut are described, and discussed in relation to possible mechanisms of solute/solvent coupling. — The structure of the gut and Malpighian tubules and the physiology of the Malpighian tubules are described during the metamorphosis of the aquatic larva to the terrestrial adult. The results are discussed in relation to this gross change in physiological requirements. (Author).
- (4166) NOVAK, I. & K. SPITZER, 1982. *Ohrožený svet hmyzu*. — [*The endangered insect world*]. Academia, Prague. 140 pp., 88 col. phot. excl. (Czech). — (Authors' addresses not stated). On pp. 113-115, *Calopteryx splendens* and *Libellula depressa* are dealt with (figs 76 and 77 resp.). Special reference is made to the

environmental vectors, threatening their populations.

- (4167) PETROV, N.B. & V.V. ALESHIN, 1982. Organization of DNA sequences in the dragonflies *Aeshna squamata* Müll. and *Calopteryx splendens* Harr. *Dokl. Biochem.* 262 (1/6): 30-33. — (Belozersky Lab. Mol. Biol. & Bioorg. Chem., Dept. Biol., Lomonosov St. Univ., Moscow, USSR).

For a study of the organization of DNA sequences, 3 different approaches were used, viz. (1) a comparison of the kinetics of the reassociation of DNA fragments of different lengths, (2) measurement of the value of the hyperchromism of reassociated repetitive DNA as a function of fragment length and (3) determination of the length of the reassociated repeats by gel filtration after treatment with nuclease  $S_1$ . The results show that no less than 30% of the genomes of the 2 spp. is organized according to the principle of alternation with a short period, characteristic of the *Xenopus* type of organization. The large size of the genomes is apparently generally characteristic for the primitive insect orders.

- (4168) PIRČOVÁ, E., 1982. Ekomorfologické štúdiu zložených očí druhov *Libellula depressa* L. (Insecta, Odonata) a *Pieris brassicae* L. (Insecta, Lepidoptera) — Ecomorphological study of the compound eyes of the species *Libellula depressa* L. (Insecta, Odonata) and *Pieris brassicae* L. (Insecta, Lepidoptera). *Biológia, Bratislava* 37 (6): 537-545. (Czech, with Engl. & Russ. s's). — (Katedra Špec. Biol., Prir. Fak., Univ. P.J. Šafárika, Mánesova 23, CZ-040 01-Košice).

The effect was studied, on the histological level, of ecologic conditions upon the construction of the compound eyes in 2 diurnal insects. While in *L. depressa* the fast and tenacious flight as well as the predatory mode of feeding have enforced particular changes in the anatomic construction of photoreceptors (extraordinary dimensions of basic parts of the ommatidium, specific construction of cornea, pigmented and unpigmented visual sensory cells, postretinal zone), this is not the case in the butterfly studied. The histology of the 2

systems is described and discussed in detail.

- (4169) PRASAD, M. & S.K. GHOSH, 1982. Studies on the estuarine Odonata from 24 Parganas District of West Bengal, with a note on the re-productive behaviour in *Urothemis signata signata* (Rambur) (Odonata: Insecta). *J. Bombay nat. Hist. Soc.* 79 (2): 290-295. — (Zool. Surv. India, 14 Madan Str., Calcutta-700072, India).

Annotated list of 23 spp., with an account of field observations (permanent freshwater pond at Paikpara, Calcutta) on the reproductive behaviour of *U.s. signata*.

- (4170) RAM, R., V.D. SRIVASTAVA & M. PRASAD, 1982. Odonata (Insecta) fauna of Calcutta and surroundings. *Rec. zool. Surv. India* 80: 169-196. — (Zool. Surv. India, 14 Madan Str., Calcutta-700072, India).

Annotated checklist (50 spp.), with detailed locality data and bibliographic references. *Ictinogomphus pertinax* is new to India, and all the spp. are keyed. (Cf. also *OA* No. 4205).

- (4171) RAO, K.R. & A.R. LAHIRI, 1982. First records of odonates (Arthropoda: Insecta) from the Silent Valley and New Amarambalam Reserved Forests. *J. Bombay nat. Hist. Soc.* 79 (3): 557-562. — (First Author: South. Reg. Stn. Zool. Surv. India, Madras-28, India).

The Silent Valley and the New Amarambalam Reserved Forests constitute the thickest evergreen tropical forests of Western Ghats, on the SW slopes of the Nilgiri Plateau. 23 spp. are reported in this paper, along with collection data and ecological notes.

- (4172) REE, Han-il, 1982. Studies on sampling techniques of mosquito larvae and other aquatic invertebrates in the rice field. *Korean J. Ent.* 12 (1): 37-44. (With Korean s.). — (Div. Med. Ent., Natn. Inst. Health, Seoul-122, Korea).

Studies on sampling techniques both by dipper and by static quadrat devices were carried out for quantitative and qualitative measurement of mosquito larvae and of other invertebrates in the rice field. Dipping can be effectively applied for absolute density estimates of the

mosquito larval populations as well as for relative density measurement. Estimates of relative population densities of other aquatic invertebrates using the static quadrat were more effective than dipping, showing 15-fold catches in Odon., 7.46-fold in Ephemeroptera, 4.49-fold in Chironomidae and 4.21-fold in Planaria.

- (4173) SCHMIDT, E., 1982. Rote Liste der Pflanzen und Tiere Schleswig-Holsteins. Libellen-Odonata. *SchrReihe Landesamt. Natursch. Landschaftspf. Schleswig-Holstein* 5: 101-104. — (Biol. Didaktik, Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG).

A classified list is given of the 61 spp. known to occur in Schleswig-Holstein, Fed. Rep. Germany. All but 5 immigrants are considered to various degrees endangered within the territory of the state. — (*Abstracter's Note*: According to a pers. comm. from the Author, he has not been informed on the intention to publish this text, has neither seen the proofs, nor received the reprints, and the published text does not reflect his actual opinion).

- (4174) STEBAEV, I.V., 1982. Opyt sopryazhennogo izucheniya ekologii i povedeniya nasekomyh v prirode i v laboratorii. II — An attempt of parallel studies of the ecology and behaviour of insects in the field and laboratory. II *Ent. Obozr.* 61 (1): 53-66. (Russ., with Engl. s.). — Unabridged Engl. transl. in: *Ent. Rev.* 61 (1): 58-72 (1982). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).

This is the second part of the paper listed in *OA* No. 3461. It is concerned with nutritional studies and biocybernetics, and includes a brief section on the Odon. (pp. 57-59).

## 1983

- (4175) (Anonymous), 1983. How about dragonflies? *Johnson City Press Chronicle* (Johnson City, Tenn., USA), issue of June 29.

The possibility of mosquito control by imported and released dragonflies, in Johnson City, Tennessee, USA, is discussed.

- (4176) *ABSTRACTS OF PAPERS submitted to the Seventh International Symposium of Odonatology, Calgary, 1983.* Edited by G. Pritchard. Issued by the Societas Internationalis Odonatologica (S.I.O.), Calgary, IV+60 pp. — Price: Hfl. 35.- (incl. the Field Trip Handbook; cf. *OA* No. 4184). — (c/o Editors of Odonatologica, Dept. Anim. Cytogen. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL).  
 Feature and Submitted papers and slide presentations: *Asahina, S.* (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA): Some biological puzzles regarding Aka-Tombo (*Sympetrum frequens*) of Japan (1-3); — *Cannings, S.G.* (Dept. Zool., Univ. Brit. Columbia, Vancouver, B.C., V6T 2A9, CA): The Beringian dragonfly *Somatochlora sahlbergi* Trybom in the Yukon Territory, Canada (4); — *Chockalingam, S., M. Krishnan & M. Johnson* (Zool. Res. Lab., Thiagarajar Coll., Madurai-625009, India): Relative toxicity of some insecticides to the final instar larva of the dragon-fly, *Brachythemis contaminata* Fabr. (4-6); — *Corbet, P.S.* (Dept Biol., Univ. Dundee, Dundee DD1 4HN, UK): Questions of current interest in dragonfly biology (6); — *Corbet, P.S. & G. Pritchard* (Second Author: Dept Biol., Univ. Calgary, Calgary, Alberta, T2N 1N4, CA): Edmund Murton Walker, 1877-1969 (7); — *Deacon, K.J.* (Biol. Dept, Lakehead Univ., Thunder Bay, Ont., P7B 5E1, CA): Seasonal emergence patterns of anisoptera in northwestern Ontario (8); — *Fincke, O.M.* (Dept Zool., Univ. Iowa, Iowa City, Iowa 52242, USA): Apparent sexual selection in the giant damselfly, *Megaloprepus coeruleatus* (9-10); — *Gonzales Soriano, E. & R.W. Garrison* (Second Author: 1030 Fondale St, Azusa, Calif. 91702, USA): The population structure of two sibling species of neotropical damselflies, *Palaemnema desiderata* Selys and *Palaemnema paulitoyaca* Calvert (Zygoptera: Platystictidae) (10-11); — *Higashi, K. & S. Nomakuchi* (Second Author: Dept Biol., Fac. Sci., Kyushu Univ., Fukuoka-812, JA): Coexistence of females and territorial males at water in Japanese calopterygid species (11-12); — *Hilton, D.F.J.* (Dept Biol. Sci., Bishop's Univ., Lennoxville, Que., J1M 1Z7, CA): Reproductive behavior of *Leucorrhinia hudsonica* (12-

- 13); — *Johnson, D.M., R.E. Bohanan, C.N. Watson & T.H. Martin* (Biol. Sci. Dept, East Tennessee St. Univ., Johnson City, TN 37614 USA): Coexistence of *Enallagma divagans* and *Enallagma triviatum* (Zygoptera: Coenagrionidae) in Bays Mountain Lake: an in situ enclosure experiment (14-15); — *Kaiser, H.* (Lehrst. Biol. V, RWTH Aachen, Kopernikusstr. 16, D-5100 Aachen, FRG): Mating strategies in dragonflies (15-16); — *Leggott, M.* (Dept Biol., Univ. Calgary, Calgary, Alberta, T2N 1N4, CA): Effect of temperature on the embryonic development of *Argia vivida* (Coenagrionidae), with reference to other aquatic insect groups (17); — *Lutz, P.E.* (Dept Biol., Univ. North Carolina, Greensboro, N.C. 27412 USA): Dragonflies and cosmology: regulation of life histories by celestial events (18-19); — *May, M.L.* (Dept Ent. & Econ. Zool., Rutgers Univ., New Brunswick, NJ 08903, USA): Energy requirements of adult Anisoptera (19-21); — *Moens, J.* (Dept S.B.M., L.U.C., Universitaire Campus, B-3610 Diepenbeek): Morphology and ultrastructure of the excretory organs in larvae of *Ischnura elegans* (Vand.) (Odonata, Zygoptera) (21-22); — *Nimz, C.* (Dept Biol., Univ. Calgary, Calgary, Alberta, T2N 1N4, CA): The emergence and adult habitats of the Anisoptera of a southern Alberta pond (23-24); — *Nomakuchi, S. & K. Higashi* (Second Author: Dept Biol., Fac. Lib. Arts, Saga Univ., Saga-840, JA): Process of territory establishment in *Mnais pruinosa pruinosa* Selys (Zygoptera: Calopterygidae) (24-26); — *Norling, U.* (Dept Zool., Univ. Lund, Helgonavägen 3, S-223 62 Lund): Life-history patterns in the northern expansion of dragonflies (26-27); — *Pickup, J. & D.J. Thompson* (Dept Zool., Univ. Liverpool, Brownlow Str., P.O. Box 147, Liverpool, L69 3BX, UK): The effects of prey density and temperature on survival and development of larvae of the damselfly, *Lestes sponsa* (Hans.) (27-28); — *Pilon, J.-G. & M.J. Masseau* (Dép. Sci. Biol., Univ. Montréal, C.P. 6128, Montréal, Que. H3C 3J7, CA): Weather and Odonata: effect of temperature on egg development (28-29); — *Prasad, M.* (Zool. Surv. India, 14 Madan Str., Calcutta-700072, India): Perching behaviour of Odonata around a perennial pond at Calcutta, India (29-30); — *Pritchard, G.* (address above): The strike mechanism in larval dragonflies (30-31); — *Schmidt, E.* (Biologie/Didaktik, Univ. Bonn., Roemerstr. 164, D-5300 Bonn-1, FRG): Habitat characterization by representative Odonata species spectrum (Ross) (31-33); — *Schneider, W.* (Inst. Zool., Univ. Mainz, Postfach 3980, Saarstr. 21, D-6500 Mainz, FRG): Taxonomy and distribution of the East Mediterranean members of the genus *Platycnemis* Charpentier, 1840 (33-34); — *Siva-Jothy, M. & P.L. Miller* (Dept Zool., Univ. Oxford, South Parks Rd, Oxford, OX1 3PS UK): Sperm competition in dragonflies (34-35); — *Srivastava, V.K.* (Dept Zool., C.M.P. Coll., George Town, Allahabad-211002, India): The male reproductive system of *Ischnura senegalensis* (Rambur) (35-36); — *Tinkham, E.R.* (81-441 Date Palm Ave., Indio, Calif. 92201, USA): Pictorial survey of the remarkable agrionine damselfly fauna of the mountain streams of South China and Formosa (36-37); — Notes on the zoogeography of Loh Fau Shan (Tiger Mountain), central Kwantung, South China, with especial reference to the odonatan fauna of South China (37-38); — New species and records of gomphine dragonflies from South China (38); — Hunting dragonflies in southern Baja California, Mexico (38-39); — *Tyagi, B.K.* (Malaria Res. Cent., Ukai-394680, India): Review of the *m*-chromosomes in Indian Odonata: their significance for taxonomy and geographical distribution (39-40); — Fifty years of karyological studies in Indian Odonata: some highlights of achievements and discussion of lacunae (40-41); — *Utzeri, C.* (Ist. Zool., Univ. Roma, Viale dell'Università 32, I-00100 Roma): Adaptive aspects of male and female drives in the reproductive behaviour of Odonata (42-43); — *Utzeri, C., E. Falchetti, G. Gianandrea, C. Lorenzi, R. Raffi & G. Sorce* (address above): Behaviour of *Crocotthemis erythraea* (Brullé) (Anisoptera: Libellulidae) (43-44); — *Waage, J.K.* (Dept Biol. & Med., Brown Univ., Box G, Providence, RI 02912, USA): The dynamics of territorial disputes in *Calopteryx maculata* (45); — Male-female

- interactions during courtship in *Calopteryx maculata* and *C. dimidiata*: the influence of submerged oviposition (46-47). — Poster presentations and Exhibits: *Caron, E. & J.-G. Pilon* (cf. address Pilon): Courbe d'émergence de *Cordulia shurtleffi* Scudder (Odonata: Anisoptera: Corduliidae) (48-49); — *Franchini, J. & J.-G. Pilon* (cf. address Pilon): Action de la température sur le développement embryonnaire d'*Ischnura verticalis* (Say) Odonata: Coenagrionidae) (50-51); — *Henderson, J.B. & T.B. Herman* (Biol. Dept, Acadia Univ., Wolfville, Nova Scotia, B0P 1X0, CA): Population ecology of *Calopteryx aequabilis* in Nova Scotia (51-52); — *Lavoie-Dornik, J. & J.-G. Pilon* (cf. address Pilon): Cone cristallin chez la larve d'*E[nallagma] cyathigerum* (Zygoptera: Coenagrionidae) (52-53); — Turnover des membranes rhabdoméennes chez la larve et l'adulte d'*E[nallagma] cyathigerum* (Zygoptera: Coenagrionidae) (53); — *Marullo, C., J.-G. Pilon & M. Mouze* (Third Author: Inst. Biol. Anim., Univ. Sci. & Techn. Lille-1, B.P. 36, F-59650 Villeneuve d'Ascq): Position du massif d'accroissement externe sur la lamina au cours de l'avant-dernier stade larvaire chez *Lestes eurinus* Say (Odonata: Zygoptera) (54); — Développement morphologique post-embryonnaire des ganglions optiques chez *Lestes eurinus* Say (Odonata: Zygoptera) (55); — *Pilon, J.-G. & J. Franchini* (address above): Etude de la différenciation des types de développement et de la variation intra-stade au cours du développement larvaire chez *Ischnura verticalis* (Say) (Zygoptera: Coenagrionidae) (56); — Etude morphologique des larves de *Ischnura verticalis* (Say) (Odonata: Coenagrionidae), élevées en laboratoire (57); — *Utzeri, C., R. Raffi & G. Sorce* (address above): Copulation behaviour of *Coenagrion scitulum* (Rambur) (Zygoptera: Coenagrionidae) (58); — *Wighton, D.* (Lab. Vert. Paleont., Dept Geol. & Zool., Univ. Alberta, Edmonton, Alberta T6G 2E9, CA): Paleocene fossil Odonata from South-Central Alberta, Canada (59). — For other Symposium publications cf. *OA* Nos 4184, 4215.
- (4177) **ADISOEMARTO, S., Y.R. SUHARDJONO & W.A. NOERDJITO**, 1983. Changes in the composition of insect communities of Ladang in Tanah Merah, East Kalimantan. *Treubia* 29 (1): 47-61. (With Malay s.). — (Mus. Zool. Bogoriense, Bogor, Java, Indonesia).  
The paper is based on 2 surveys, conducted in a shifting-cultivated rice field in eastern Borneo, Indonesia, during late March-early April and in the mid of July, 1978. 4 odon. spp. were encountered, but *Pantala flavescens* is the only one identified.
- (4178) **AGUDELO-SILVA, F.**, 1983. El hongo entomógeno *Paecilomyces fumosoroseus* esporulado sobre un adulto vivo de *Argia oculata* (Odonata: Coenagrionidae [sic]). — [The entomogenic fungus, *Paecilomyces fumosoroseus*, sporulating in a live *Argia oculata* adult (Odonata: Coenagrionidae)]. *Bol. Ent. venez.* (NS) 2 (17): 130-131. (Span.). — (Inst. Zool. Agric., Fac. Agron., Univ. Central Venezuela, Aptdo 4579, Maracay-2101-A, Venezuela).  
The sporulation of entomogenous fungi usually takes place after the death of the insect. The exceptions are *Aspergillus*, *Sorospora*, *Ceolomomyces*, *Massospora cicadina*, *M. levispora*, *Entomophthora erupta* and *Strongwellsea castrans*. In *P. fumosoroseus* this phenomenon has not been known previously. The dragonfly was taken at Rio Periquitos, Aragua, Venezuela.
- (4179) **ALTMÜLLER, R.**, 1983. *Libellen. Beitrag zum Artenschutzprogramm. Rote Liste der in Niedersachsen gefährdeten Libellen*. Niedersächsisches Landesverwaltungsamt, Hannover. 28 pp. — (Copies free from: Niedersächsisches Landesverwaltungsamt, Postfach 107, D-3000 Hannover-1, FRG).  
A brief general outline of dragonfly biology is followed by considerations on conservation. Of particular interest is a classified list of the spp. known to occur in Lower Saxony, F.R. Germany, showing the status, larval ecological requirements, and the causes of threat for each sp.
- (4180) **AMATEUR ENTOMOLOGISTS' SOCIETY, THE**, 1983. *Membership list*. 39 pp. — (355 Hounslow Rd, Hanworth, Middx, TW13 5JH, UK).

The list contains the addresses of some 1700 members, about 90 of whom stated their interest in Odon. On the Society's Advisory Panel, D. Keen (4 Bramber Close, Banbury, Oxon OX16 OXF, UK) is responsible for the Order. — (*Abstracter's Note*: In resp. 1976 and 1978 (cf. *OA* Nos 1605, 2344), there were resp. about 40 and 60 odonatologists among the Society's membership (resp. 1200 and 1400 approx.).

- (4181) ARBELÁEZ, M.T., 1983. Un grupo fue al Amazonas y vino lleno de nuevos conocimientos para la bibliografía mundial. Descubrir a Venezuela es todavía una expedición. *El Diario*, Caracas, issue of June 19, p. 56 (Span.). — (Author's address not stated).  
A daily's account on a research expedition to El Marahuaka, Venezuela. Without stating the taxonomic name, reference is made to the capture of a ♂ of *Lauiromacromia dubitalis*. This is the second known specimen of this sp. (♀ is unknown) and the sp. is new for Venezuela. — (*Abstracter's Note*: This information is based on a personal communication from Lic. J. De Marmels, Inst. Zool. Agric., Maracay, Venezuela).
- (4182) ARMETT-KIBEL, C. & I.A. MEINERTZ-HAGEN, 1983. Structural organization of the ommatidium in the ventral compound eye of the dragonfly *Sympetrum*. *J. comp. Physiol.* (A) 151 (3): 285-294. — (First Author: Dept Biol., Univ. Massachusetts, Boston, Mass. 02125, USA).  
In *S. rubicundulum*, the circumferential sequence of retinular cells \*R5\*R4, R3\*R2, R1\*R8, R7, R6 (in which R5 & 8, R2 & 3, R1 & 4 comprise three receptor pairs, R7 and R6 an unmatched pair with long visual fibres, and asterisks denote the position of cone cell processes) is homologized to the general pattern of odonate retinulae. This sequence runs in an anticlockwise direction for ommatidia of the right ventral retina viewed from outside inwards, that in the left retina runs clockwise. The proximodistal sequence of contributions of these cells to the retinula (presence of nucleus, contribution to the tiered rhabdom, Fig. 1) has R1 & 4 in the basal third (Fig. 10) beneath R5 & 8, and R2 & 3 (Fig. 6); R7 has a large distal rhabdomere beneath which R6 contributes a few microvilli for most of the rhabdom's length. There is no twist to the rhabdom, and neighbouring ommatidia have consistent orientations. R1 is dorsal and R2 & 3 anterior. Rhabdom diameters are shown in Table 1; individual rhabdomere volumes are as follows: R7, 320  $\mu\text{m}^3$ ; R5 & 8, 650  $\mu\text{m}^3$  each; R2 & 3, 430  $\mu\text{m}^3$  each; R1 & 4, 230  $\mu\text{m}^3$  each.
- (4183) BELLE, J., 1983. Some interesting Odonata Anisoptera from the Tarn, France. *Ent. Ber., Amst.* 43 (6): 93-95. — (Onder de Beumkes 35, 6883, HC Velp, NL).  
*Gomphus grasslini*, *G. pulchellus*, *G. simillimus*, *G. vulgatissimus*, *Onychogomphus forcipatus unguiculatus*, *Boyeria irene* (♀ f. *brachycerca*), *Cordulegaster bidentatus*, *C. boltoni*, and *Marcromia splendens* are recorded from the Tarn River, and the crepuscular activity of ♀ *Anax imperator* is mentioned.
- (4184) CANNINGS, R.A., 1983. *Field trips handbook [of] the Seventh International Symposium of Odonatology, Calgary*. IV+24 pp. Societas Internationalis Odonatologica (S.I.O.), Calgary. — Price: Hfl. 35.- (incl. the Abstracts of Papers booklet; cf. *OA* No. 4176). — (c/o Editors of *Odonatologica*, Dept Anim. Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL).  
Contents: "Collecting during field trips", "Natural and human history of the region", "Short field trips: Fish Creek — Sibbald Flats, Spy Hill — Kananaskis Valley, Banff sightseeing", "Post-Symposium Tour: Rocky Mountains/Columbia Valley", "The Odonata of the Symposium region: Zoogeographic overview, Species list, References".
- (4185) CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS [Newsletter of the Dutch Dragonfly Workers], No. 5 (May, 1983). Issued by the Werkgroep Nederlandse Libellenonderzoekers — [Association of the Dutch Dragonfly Workers], Bussum. (Dutch). — Subscription for 1983: Hfl. 11.-. — (c/o M. Verdonk, Floralialaan 47, 1402 NJ Bussum,

- NL; — for order conditions cf. *OA* No. 3214). The issue contains news communications related to the European Invertebrate Survey, Societas Internationalis Odonatologica (both *anonymous*), and to the odonatological groups of the Netherlands Youth Federations, ACJN and NJN (*L. Beukeboom* and *N. Michiels*). Also included is a report on the Eighth Colloquium of Dutch Dragonfly Workers, Nat. Hist. Mus., Tilburg, March 19, 1983 (*M. Wasscher*). Of interest are 2 technical notes, viz.: *Wasscher, M.* (I.B. Bakkerlaan 117-II, 3583 XP Utrecht, NL): Aanvulling op de Nederlandse naamlijst [Additions to the list of Dutch vernacular names] (10), and *Beukeboom, L. & M. Wasscher* (First Author: Van Royenlaan 23 b, 9721 EK Groningen, NL): Het voorkomen van de maanwaterjuffer (Coenagrion lunulatum) 1982 [The 1982 records of Coenagrion lunulatum] (11). In addition to various appeals for collaboration, there is an *anonymous* list of interesting national records in 1982 and 1983 (15-16). A number of *anonymous* book reviews and mutations of the membership/ mailing list conclude the issue.
- (4186) COOPER, S.D., 1983. Selective predation on cladocerans by common pond insects. *Can. J. Zool.* 61: 879-886. (With Fr. s.) — (Dept Biol. Sci., Univ. California, Santa Barbara, Cal. 93106, USA).  
A variety of common pond insects was presented with a mixture of different size classes of various cladocerans. Most instars of *Anax junius* fed at the highest rates on the largest available prey.
- (4187) CORREA, M. & R. COLER, 1983. Enhanced oxygen uptake rates in dragonfly nymphs (*Somatochlora cingulata*) as an indication of stress from naphthalene. *Bull. environ. Contam. Toxicol.* 30: 269-276. — (Dept Environ. Sci., Univ. Massachusetts, Amherst, Mass. 01003, USA).  
The feasibility of interpreting variations in the respiration rates of *S. cingulata* as short-term indicators of stress incurred by exposure to aromatic hydrocarbons is determined and discussed.
- (4188) COWIE, B., 1983. Macroinvertebrate taxa from a southern New Zealand montane stream continuum. *N.Z. Ent.* 7 (4): 439-447. — (Canterbury Mus., Rolleston Ave., Christchurch, NZ).  
The macroinvertebrate communities in 2 forested and 2 open sites along a relatively unmodified beech forest stream continuum in the Devil Creek, western coast, South Island, New Zealand, were investigated by intensive benthic sampling. There were no Odon. in the aquatic samples. *Xanthocnemis zealandica* and *Uropetala c. carovei* were collected by hand.
- (4189) FERGUS, C., 1983. Thornapples. *Pennsylvania Game News* 54 (6): 49-54. — (c/o Dr C. Shiffer, 254 Gill Str., State College, Pa 16801, USA).  
This is a longer version of the "dragonfly interview" given by Dr Clark Shiffer. An earlier published abridged text is listed in *OA* No. 3766.
- (4190) FERRERAS ROMERO, M., 1983. Nueva cita para España de *Macromia splendens* (Pictet, 1843) (Odon., Corduliidae). *Bol. Asoc. esp. Ent.* 6 (2): 395. — (Dep. Zool., Fac. Cien., Univ. Córdoba, Avda Medina Azahara S/N, Córdoba, Spain).  
2 larvae from the Tavizna River (El Bosque y Ubrique, Cádiz prov., Spain) are placed on record and briefly described.
- (4191) FRASERIA. Newsletter of the S.I.O. National Office in India, Ukai, No. 4 (June 1, 1983) — For order conditions cf. *OA* No. 3423. — (c/o Dr B.K. Tyagi, Malaria Res. Cent., I.C.M.R., Ukai-394680, Distr. Surat, Gujarat, India).  
(*Anonymous*): Prof. Dr Elwood Montgomery passed away (13); — Reannouncement of First All-India Conference on Odonatology (13); — Dragonfly dance [a note on the folk-dances of the Goans] (14); — Indian Bibliography Scheme: Odonatological bibliography of Dr A. Kumar (14-15); — *Kumar, A.* (Northern Reg. Stn, Zool. Surv. India, 13 Subhash Rd, Dehra Dun-248001, U.P., India): An annotated list of Odonata from the Jammu region

- (Western Himalaya, Jammu & Kashmir, India) (15-16); — (*Anonymous*): [Book Review]: Carchini, G., A key to the Italian odonate larvae (16).
- (4192) GENT, C.J., 1983. [Records]. Odonata — dragonflies and damselflies. *Vasculum* 68 (1): 5. — (c/o Editor, T.C. Dunn, The Poplars, Chester-le-Street, Co. Durham, UK). *Aeshna juncea* is reported from Big Waters, Seaton Burn, UK, June 7, 1982. The early season for this sp. is emphasized.
- (4193) HALVERSON, T.G., 1983. *The evolution of dragonfly life histories in heterogenous environments*. PhD thesis Univ. Maryland, College Park, Maryland. XVI+134 pp. — (Dept Zool., Univ. Maryland, College Park, Maryland 20742, USA). — Microfilm or xerox available at University Microfilms International, Dissertation Copies, P.O.B. 1764, Ann Arbor, Mich. 48106, USA: Order No. not yet published). [Verbatim author's abstract]: *Aeshna tuberculifera* Walker and *A. umbrosa* Walker were studied in the Shenandoah Mountains, Rockingham County, Virginia over a 5-year period. Both spp. had a 2-year life cycle. The first winter was passed in an embryonic diapause and the second in a larval diapause. Although *A. umbrosa* was a slightly smaller sp. and developed earlier in the year, growth patterns of the 2 spp. were similar. Adults emerged from mid-summer to mid-fall with a slight tendency for males to emerge earlier than females. Sex ratio at emergence was equal in *A. tuberculifera* but biased somewhat toward males in *A. umbrosa*. Individuals which emerged later in the season tended to be smaller than those that emerged earlier regardless of sex, and the decline in size was linear over time. Poor recovery of marked teneral and breeding adults indicated either high mortality or high dispersal. Observations of movements among ponds by marked breeding adults suggest the latter. The teneral period was between 4 and 6 weeks. Breeding males of both species defended entire ponds for short periods of time. Both males and females were present more frequently in the afternoon than during the morning or at mid-day. Females often oviposited in the late afternoon or early evening when males were usually absent from the ponds. Oviposition preference of the 2 spp. differed markedly with *A. tuberculifera* using stems of *Juncus effusus* L. almost exclusively while *A. umbrosa* rarely used *J. effusus* stems but used a wide variety of dead plant or other material.
- (4194) HERMANS, J., 1983. Libellentabel voor België. *Natuurh. Maandbl.* 72 (4): 84. (Dutch). — (Hertestr. 21, 6067 ER Linne, NL). Indicative book review of the work listed in *OA* No. 3960.
- (4195) KESSEL, R.G., 1983. Fibrogranular bodies, annulate lamellae, and polyribosomes in the dragonfly oocyte. *J. Morph.* 176 (2): 171-180. — Dept Zool., Univ. Iowa, Iowa City, Iowa 52242, USA). Discrete and multiple cytoplasmic regions become apparent during oogenesis in *Libellula pulchella* oocyte that are thought to arise from the nucleus (nucleolus) earlier in development, and on the basis of previous cytochemical tests, they are believed to contain ribonucleoprotein. These distinct cytoplasmic regions have been called fibrogranular bodies since they are composed of (1) a multitude of small granules (~ 6-16 nm) and (2) interconnected fibrillar elements (~ 2-4 nm wide). Since the fibrogranular bodies have not been isolated, they have not been biochemically characterized and their composition is unknown. However, it has been suggested that this material, in part based on other studies, may represent stored developmental information, perhaps including mRNA, rRNA, and protein. Prior to vitellogenesis, but continuing throughout the process, annulate lamellae progressively differentiate within the fibrogranular bodies. After annulate lamellae have differentiated inside the fibrogranular bodies, many of the lamellae extend into the surrounding cytoplasm as elements of rough-surfaced endoplasmic reticulum (rER). There appears to be a gradual dispersal of material as more and more annulate lamellae form within the fibrogranular bodies such that very late in

oogenesis, it is difficult to observe the fibrogranular material. However, extensive numbers of polyribosomes and many parallel lamellae of rER are present. The variations noted with respect to the polyribosomes, fibrogranular bodies, and pores of the annulate lamellae suggest that pores of annulate lamellae are important in the processing or activation of "stored information" for subsequent development, perhaps including, a role in polyribosomal assembly. (Author).

- (4196) KESSLER, E., 1983. Allgemeine Tätigkeit und Vollzug des Reusstalgesetzes. *Jber. Stift. Reusstal*, Bremgarten 1982: 7-13. — (Busslingerstrasse 10, CH-5452 Oberrohrdorf).  
In the paragraph, "Reussebene — Lebensraum gefährdeter Libellenarten" (p. 12), a reference is made to the paper listed in *OA* No. 4202, and the Stille Reuss is mentioned as the sole locality of *Leucorrhinia caudalis* known at present in Switzerland.
- (4197) KNIGHTS, R., 1983. Coenagrion mercuriale on the East Devon Pebblebed Commons. *Bull. Br. ecol. Soc.* 14 (2): 40-42. — (c/o D.T.N.C., 35 New Bridge Str., Exeter, Devon, UK).  
The ecology of *C. mercuriale* populations at Colaton Raleigh, Devon, UK, was studied in 1982. It is summarised that in Devon, populations of this sp. are associated with (1) boggy heathland with relatively open flushes and gently flowing seeps, (2) the occurrence of *Schoenus nigricans* and *Drosera* sp., and (3) with a chemical environment that is low in nitrate, but comparatively base-rich.
- (4198) KÜNAST, C., 1983. Jagdwunder Libelle: 30.000 augen suchen ein Opfer. *Tier* 1983 (7): 66-69. — (Abt. Weihenstephan, Univ. München, D-8000 München, FRG).  
A general article; both the text and the figs are of a very moderate quality.
- (4199) KUNG, Hsüeh-Ju [= GONG, Xue-ru], 1983. [Observation tour to the Wuyi Shan Nature Reserve. Part II. The insect world]. [*People's China*] 1983 (1): 103-109. (Jap.). — (Author's address not stated).
- The Wuyi Mts (= Wu-i Shan-mo), or the Bohea Hills, as known in western literature, are a range in the borderland between the provinces of Fujian (= Fukien) and Kiangsi, P.R. China. The area has been recently proclaimed a Nature Reserve. It has been explored for the first time by Father David, in 1873, and includes such famous gomphide type localities as Kua-tun and Ta-chu-lan. The main credit for the biol. research in the Reserve goes to Prof. Dr Hsiu-fu Chao (= Xiu-fu Zhao), the well known doyen of Chinese odonatologists (for his address cf. e.g. *OA* No. 3953), who is also serving as Chief Editor of the Wuyi Science Journal, which commenced publication in 1981. — This article is directed at a general (Japanese) reader. One of the 4 chapters is devoted to Dr Chao ("The entomologist Professor Hsiu-fu Chao and the Wuyi Shan", pp. 105-106); it contains some references to Odon., and a photograph of Dr Chao (p. 106, to the right).
- (4200) LEHMANN, G., 1983. Die Geburt einer Libelle. Der Schlüpfprozess bei der Kleinen Binsenjungfer — *Lestes sponsa* (Charp.). *Jber. Bundesygm. Kufstein* 76: 15-18. — (Stimmerfeldstr. 17, A-6330 Kufstein).  
An annotated photographic record (6 figs) of the ecdysis of *Lestes sponsa* (Haslach-Moor, Häring, Bez. Kufstein, Austria; July 14 and Sept. 14, 1982).
- (4201) MAIBACH, A., 1983. Odonates de rivières en Suisse romande: répartition et menaces de disparition. *Bull. romand Ent.* 1 (3): 155-166. (With Engl. s.). — (Mus. Zool., Place Riponne, CH-1005 Lausanne).  
The status and distribution of the Calopterygidae and Cordulegastridae in western Switzerland are presented, and the causes of their regression are discussed.
- (4202) MEIER, C., 1983. Die Libellen des Reusstals zwischen Rottenschwil und Rickenbach. *Jber. Stift. Reusstal*, Bremgarten 1982: 21-28. — (Zool. Mus., Univ. Zürich, Winterthurerstr. 190, CH-8057 Zürich).  
A preliminary discussion of the odon. fauna of the Upper Reusstal, canton Aargau, Switzer-

land (37 spp.) is presented along with biogeographic considerations and with reference to the habitat management measures. *Erythromma viridulum* and *Leucorrhinia caudalis* are among the noteworthy breeding spp. recorded. (Cf. also *OA* No. 4196).

- (4203) MEINERTZHAGEN, I.A., R. MENZEL & G. KAHLE, 1983. The identification of spectral receptor types in the retina and lamina of the dragonfly *Sympetrum rubicundulum*. *J. comp. Physiol. (A)* 151 (3): 295-310. — (First Author: Dept Psychol., Life Sci. Centre, Dalhousie Univ., Halifax, Nova Scotia B3H 4J1, CA).  
Photoreceptors and monopolar cells in the ventral eye of *S. rubicundulum* have been recorded from intracellularly and stained with Lucifer yellow. Units with four types of spectral sensitivity were found having  $\lambda_{\max}$  at 340, 410, 490-540 and 620 nm. On the basis of a significant difference in half bandwidth of  $S(\lambda)$ , the green receptors are separable into two subgroups with  $\lambda_{\max}$  at 490 and 540 nm. The fluorescence marking reveals that R5/8 and R2/3 are the green receptors; R1/4 is either a UV or an orange cell. Discrimination between the members of the three matched pairs R2 & 3, R5 & 8, and R1 & 4 has not been possible. R7 is the violet receptor, and R6 is probably an additional green receptor; these are the receptors with long visual fibres. No receptors in the ventral eye besides the orange (620 nm) are sensitive to polarized light, whereas UV receptors in the dorsal eye are highly sensitive to polarized light. The polarized light sensitivity of the orange receptors is interpreted as an adaptation to increase the contrast between a conspecific animal and shorter wavelength light with a predominantly horizontal E-vector, such as is provided by reflections on the water's surface. — Cell identification is complicated by the fact that in most cases more than one cell is dyemarked. We present evidence in favour of dye-coupling being functional and against it being any simple artifact. Most importantly, the cellular pattern of dye-coupling is related to the spectral sensitivity of the recorded unit. — Recordings from monopolar cells are interpretable in the light of the results of both receptor markings and the anatomical pattern of their synaptic connectivities. The significance of a previously described asymmetry of the synaptic connections of the lamina terminals from R1 and R4 is now most easily understood as the counterpart of a duality in the spectral properties of this receptor pair; whether UV-or orange-sensitive types coexist within a single ommatidium or are segregated between different ommatidia is, however, not known. (Authors).
- (4204) [MERRITT, R.], 1983. The British Dragonfly Society. *Quart. J. Derby. ent. Soc.* 72: 7. — (48 Somersby Av., Walton, Chesterfield, Derby. S42 7LY UK).  
A note on the formation of the Society, by the Hon. Secretary. (Cf. also *OA* No. 4108).
- (4205) MITRA, T.R., 1983. A list of the Odonata of Calcutta, India. *Ent. mon. Mag.* 119 (March): 29-31. — (60 Shyam Nagar Rd, Calcutta-700055, India).  
A checklist (44 spp.), with nomenclatural and other taxonomic notes on some taxa. (Cf. also *OA* No. 4170).
- (4206) MOORE, K.F., 1983. Dragonfly recording in Derbyshire. *Quart. J. Derby. ent. Soc.* 72: 7. — (451 Nottingham Rd, Chaddesden, Derby., UK).  
During the summer of 1983 a determined effort is to be made to accurately record the odon. distribution in Derbyshire, United Kingdom. The author should be contacted for further details.
- (4207) MOORE, K.F., 1983. How many dragonflies are there in Derbyshire? *Quart. J. Derby. ent. Soc.* 72: 7-8. — (451 Nottingham Rd, Chaddesden, Derby., UK).  
A list of 12 spp. recorded so far in South Derbyshire, United Kingdom.
- (4208) NEL, A. & M. PAPAIZIAN, 1983. Description d'une nouvelle espèce d'Odonate fossile du Stampien d'Aix-en-Provence (Odonata Aeschnidae). *Entomologiste* 39 (3): 119-122. — (First Author: 8 av. Gassion, F-13600 La

- Ciotat; — Second Author: 23 blvd Roux-Prolongé, F-13004 Marseille).
- Jagoria oligocena* sp. n., from the famous Oligocene deposits (Stampien) of Aix-en-Provence (Bouches-du-Rhône), France, is described and illustrated. In addition, a tabular comparison is given of the venational characters in the aeshnid genera *Anax*, *Hemianax*, *Anaciaeschna*, *Aeshna*, *Jagoria*, *Linaeschna*, *Gomphaeschna*, *Oplonaeschna*, *Allopetalia*, *Basiaeschna* and *Boyeria*. The holotype is the only spec. known; it is deposited in the collection of the first Author.
- (4209) NEVILLE, A.C., 1983. Daily cuticular growth layers and the teneral stage in adult insects: a review. *J. Insect Physiol.* 29 (3): 211-219. — (Dept Zool., Univ. Bristol, Woodland Rd, Bristol, BS8 1UG, UK).
- The paper reviews the first 20 yrs of progress on the occurrence and applications of daily growth layers in cuticle and daily growth bands on muscle apodemes. The methods can be used for finding the age of an insect in the teneral stage of the adult instar, in either laboratory or field material. Existing as well as potential applications are summarized with reference to teneral development and biochemistry, physiology and behaviour, and ecology (incl. pest ecology). In the list of spp., pertaining to 8 orders, the adults of which are shown to have daily growth layers in the cuticle, there are also 2 Odon. (*Aeshna grandis* and *A. juncea*).
- (4210) NICHOLLS, S.P., 1983. Ionic and osmotic regulation of the haemolymph of the dragonfly, *Libellula quadrimaculata* (Odonata: Libellulidae). *J. Insect Physiol.* 29 (6): 541-546. — (H.H. Wills Physics Lab., Univ. Bristol, Royal Fort, Tyndall Ave., Bristol, BS8 1TL, UK).
- Larvae of the widespread *L. quadrimaculata*, were adapted to a series of salt solutions, and the osmotic pressure, and sodium, potassium and chloride concentrations in the haemolymph measured. The regulation of potassium is extremely efficient over the range 0-50 mmole/l external concentration. Above this, larvae die. Sodium and chloride are regulated to a lesser extent, the larvae being able to withstand considerable changes in the concentration of these ions in the haemolymph. However, at higher external concentrations, the haemolymph concentration of these ions is maintained below that of the external medium. The osmotic pressure is regulated in parallel with sodium concentration over most of the range tested. However, in higher salinities, the osmotic pressure of the haemolymph does not fall below that of the external medium. This is seen as a strategy to limit the amount of drinking in saline media. Overall, the osmoregulatory system of *L. quadrimaculata* resembles that of brackish-water insects, rather than that of the more strictly freshwater dragonflies that have been studied. (Author).
- (4211) *NOTULAE ODONATOLOGICAE*. Semianual bulletin of the International Odonatological Society. Published by the Societas Internationalis Odonatologica (S.I.O.), Utrecht. Vol. 2, No. 1 June 1, 1983). — Annual subscription Hfl. 25.- net. — (c/o Dept Anim. Cytogen. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL).
- Francez, A.J. & J. Brunhes* (Lab. Ecol. terrestre, Univ. Clermont-Ferrand II, B.P. 45, F-63170 Aubière): Odonates des tourbières d'Auvergne (Massif Central français) et répartition en France des odonates d'altitude (1-8); — *Aguiar, C. & S. Aguiar* (Rua Alfredo Cuna 225-2ºE, PT-4450 Matosinhos): *Brachythemis leucosticta* (Burm.) and *Trithemis annulata* (P. de Beauv.) in Portugal (Anisoptera: Libellulidae) (8-9); — *Donath, H.* (Jahnstr. 6, DDR-7960 Luckau, GDR): Veränderungen in der Libellenfauna des Oberspree-waldes, Deutsche Demokratische Republik (9-10); — *Dumont, H.J.* (Inst. Zool., Univ. Gent, Ledeganckstr. 35, B-9000 Gent): On the dragonflies of the Ethiopian plateau and Lake Tana (10-11); — *Ferreras Romero, M.* (Dep. Zool., Fac. Cien., Univ. Córdoba, Avda. Medina Azahara S/N, Córdoba, Spain): Notas sobre la fauna odonologica de la Laguna de Zofar, Andalucía, España (11-12); — *Gloyd, L.K.* (Mus. Zool., Univ. Michigan, Ann Arbor, Mich. 48109, USA): The type species of the genus *Paragomphus* Cowley, 1934 (Anisoptera: Gomphidae) (12-

- 13; — *Hilton, D.F.J.* (Dept Biol. Sci., Bishop's Univ., Lennoxville, Que. J1M 1Z7, CA): Severed male abdomens in tandem with female *Nehalennia gracilis* Morse (Zygoptera: Coenagrionidae) (13-14); — *Kiauta, B. & M. Kiauta* (Dept Anim. Cytogen. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL): Further notes on Philippine odonate karyotypes (14-15); — *Ram, R., V.D. Srivastava & M. Prasad* (Zool. Surv. India, 14 Madan Str. Calcutta-700072, India): A note on a collection of Odonata from eastern Uttar Pradesh, India (15-16); — *Jurzitza, G.* (Bot. Inst. Univ. Karlsruhe, Kaiserstr. 12, D-7500 Karlsruhe, FRG); [Book review]: the wing vein homologues and phylogeny of the Odonata, by F.L. Carle (16).
- (4212) PITTAWAY, A.R., 1983. The dragons of al-Hasa. *Aramco World Mag.* 34(2): 2-3. — (Author's address not stated: — Editor: Laan van Meedervoort 55, 2517 AG The Hague, NL).  
A general description of the dragonfly world of Saudi Arabia, with special reference to the al-Hasa Oasis, Eastern Prov. The spp. mentioned are *Enallagma vansomereni* and *Crocothemis chaldaeorum* (both central Saudi Arabia), *Anax imperator* (northern Oman), and *Anax parthenope*, *Crocothemis servilia* and *Trithemis annulata* (all without localities). *A. parthenope* and *Selysiothemis nigra* are said to undertake long northward migrations, mostly during the night, in March and Apr. In Arabic, 'yasib' (the dragonfly) is known as 'Abu-bashir' (= 'the bearer of good news'). — (*Abstracter's Note*: One of the 3 col. photogr., said to show *S. nigra*, is probably wrongly identified).
- (4213) POND, W., 1983. Solving a linguistic murder with the aid of entomology. *Weta* 6 (1): 1-10. — (47 Makora Ave., Blackpool, Waiheke Island, NZ).  
Linguists are of the opinion that the cultural division between East and West Polynesia is not reflected linguistically, and they divide the Polynesian languages into 2 major groups, viz. Tongic (Tonga, Niue), and Nuclear Polynesia (the Samoic languages: Samoa, Tokelau, 'Uvea, Futuna, Tuvalu, etc.; the Outlier languages in Melanesia: Renell, Nukuoro, Kapingamarangi, etc.; and East Polynesian languages: Maori, Rarotonga, Tuamotu, Hawai'i, etc.). — 'In the present paper a review is given of expressions for various insects, in various Polynesian languages; the Odon. are dealt with on pp. 2-3, covering 6 languages, viz. Tonga (old): *lakia* ("dragonfly"), *kisikisivai* ("horsefly"), — (modern): *kisikisi* ("dragonfly"), *kisikisivai* ("horsefly: large iridescent blue dragonfly"); — Niuaotupapu: *manukisikisi*, *kisikisi*, *kisi* ("dragonfly, damselfly"); — Futuna: *kisikisi* ("sp. spider which clings to leaves"), *mumu* ("dragonfly"); — Samoa: *sēmū* ("dragonfly"), *mātanga* ("k. dragonfly"); — Tuvalu (Nunumea): *fakamū* ("dragonfly"); — (Tokelau): *hēhēmū* ("dragonfly"); — Maori: *kēkēwai* (blue bodied), *kihitarā* (red bodied), *kapokapowai*, *tiemiemi*, *uruururora*, etc. (For the Maori terms cf. also *OA* Nos 2867, 3693). B. Biggs (1981, A complete English-Maori dictionary, Auckland Univ. Press) has suggested that *kiitikiwai* is a Tongic form, Tongan influence extended to Futuna in the 17th Century. Niuaotupapu usage accords with Tongan.
- (4214) PORTIN, P., 1983. Tarvo Oksala in memoriam. *Luonnon Tutkija* 87 (1): 32-33. (Finnish). — (Dept Genet., Univ. Turku, SF-20500 Turku).  
Obituary for Prof. T.A. Oksala; with a portrait. (Cf. also *OA* No. 3935).
- (4215) PROGRAM AND GENERALITIES of the Seventh International Symposium of Odonatology, Calgary, 1983. Edited by G. Pritchard. Issued by the Societas Internationalis Odonatologica (S.I.O.), Calgary, IV+32 pp. — While stocks last: available free to those ordering the Symposium Abstracts and the Symposium Field Trip Handbook (cf. *OA* Nos 4176, 4184). — (c/o Editors of Odonatologica, Dept Anim. Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL).  
Aka Tombo (1); — Symposium Officers (2); — Acknowledgements (3); — Maps of the city of Calgary and of the University Campus of Calgary (4-5); — Symposium location (6); — Telephone numbers and mailing addresses (7);

- Arrival and reception (7); — Registration (8); — Accommodation and meals (8); — Symposium Barbeque and Dinner (8-9); — Conference Sessions (9); — Field Trips (9-10); — Post-Symposium Tour to the Rocky Mountains and Columbia Valley (10); — Physical Education Building (11); — The City of Calgary (12-14); — Agenda [of the Plenary] Business Meeting of SIO (15-16); — Conference Program (17-22); — Titles of Poster Papers (23); — List and addresses of participants (24-32). — For the other Symposium publications cf. *OA* Nos 4176, 4184.
- (4216) RETTIG, K., 1983. Neues aus der Insektenwelt Ostfrieslands. *Ber. Beitr. Vogel - Insektenwelt nordw. Ostfriesland* 14: 31-32. — (Danziger Str. 11, D-2970 Emden, FRG). Records for 4 spp.
- (4217) RÜPPELL, G., 1983. *Aeschna cyanea* (*Aeschnidae*) - *Flugverhalten*. Flying behaviour. Dragon fly. Inst. Wiss. Film, Göttingen; Order No. E-2712 (v). — (Orders to: Inst. für den wissenschaftlichen Film, Nonnenstieg 72, D-3400 Göttingen, FRG).  
A technical film (duration 3½ min), also available in a video tape version.
- (4218) SCHALLER, F. & M. CHARLET, 1983. Cephalic neurohemal organs in Odonata. In: A.P. Gupta. [Ed.], Neurohemal organs of arthropods: their development, evolution, structures and functions, pp. 319-335. Thomas, Springfield. — (Lab. Biol. gén., Univ. Louis Pasteur, 12 rue de l'Université, F-67 Strasbourg).  
The corpora cardiaca (CC) of the Odon., situated behind the brain, form an annular thickening around the anterior part of the aorta and are innervated by a pair of nerves (NCC), originating in the neurosecretory (NS) cells of the pars intercerebralis (PI). The existence of a second pair of cardiacal nerves, at least in the form of nerves having an independent course outside the brain, has not been proved. The presence within these organs of two intermingled types of cellular constituents, namely the endings of the NS axons (extrinsic) issuing from the NCC and the intrinsic cells of glandular nature, centers on these organs simultaneously the structure of a neurohemal organ and that of a glandular organ. The intermingling of the extrinsic and intrinsic cells is a primitive feature from the standpoint of the evolution of the CC and brings the Odonata closer to the Ephemeroptera, the most primitive order of the Paleoptera, and separates them from the Neoptera, in which a progressive separation of the nervous (extrinsic) elements and the glandular (intrinsic) elements has occurred. The CC represent the site of transit and release into the hemolymph of the cerebral prothoracotropic hormone secreted in the PI. Stimulation of the prothoracic glands results in the synthesis of the molting hormone, which assures the regularity of the molting cycle and permits the resumption of development after an interruption due to the nymphal diapause. Nymphs in which the PI has been destroyed no longer molt, and they exhibit CC that are devoid of NS products. Implantation of a single PI-CC complex with its nervous connections intact is sufficient to provoke a rapid resumption of their development. The presence of the CC in such implants has the effect of promoting the secretory activity of the PI and the rapid diffusion of the cerebral hormone via these organs. The neuroendocrine control of vitellogenesis has been demonstrated by the injection of extracts of brain and CC into adult females. Such injections have the effect of hastening the synthesis of the vitellogenic proteins found in the hemolymph. (Authors).
- (4219) SOCIETAS ENTOMOLOGICA FENNICA, 1983. Yhteinen jäsenluettelo. — Gemensam medlemskatalog — Joint list of members. 31.12.1982. *Notul. entomol.* 63: 17-36. Including the addresses of close to a dozen of Finnish odon. workers.
- (4220) TRAUTNER, J., K. GEIGENMÜLLER & B. DIEHL, 1983. Federsee — Sommerlager '82. Libellen. *Naturk. Beitr. DJN* 10: 46-51. — (Third Author: Sicherstr. 12, D-7031 Neuweiler, FRG).  
The odon. fauna (22 spp.) is briefly discussed.

- The exact geographic location of the locality (in Baden Württemberg, F.R. Germ.) is not specified.
- (4221) VAN DEN BRAND, S.H., M. VERDONK & M. WASSCHER, 1983. Libellen-varia. — [Dragonfly miscellanea]. *Natura*, Netherlands 80 (65): 3 pp. (no pagination). (Dutch). — (Second Author: Florialiaaan 47, 1402 NJ Bussum, NL).  
Notes on the Netherlands section of the European Invertebrate Survey, and on various current odonatol. publications published in the Netherlands, or of importance for the work on the Dutch odon. fauna.
- (4222) VOGT, F.D. & B. HEINRICH, 1983. Thoracic temperature variations in the onset of flight in dragonflies (Odonata: Anisoptera). *Physiol. Zool.* 56 (2): 236-241. — (Zool. Dept, Univ. Vermont, Burlington, Vermont 05405, USA).  
Thoracic temperatures ( $T_{th}$ ) of "flier" and "percher" dragonflies were monitored at the onset of flight. Rate of  $T_{th}$  warm-up during shivering in fliers was positively correlated with ambient temperature ( $T_a$ ) with no clear correlation with body size. In these animals,  $T_{th}$  at takeoff ranged from 27 C to 39 C and was positively correlated with body mass. Spontaneous takeoff by perchers in shade was dependent on  $T_a$  and usually occurred at approximately 7 C above the minimum  $T_{th}$  required for flight. Small perchers (100-200 mg) remained perched until  $T_{th} = 16$  C or more, while larger perchers (300-400 mg) did not fly until  $T_{th}$  increased to at least 19 C. Perchers flew earlier in the day and had higher  $T_{th}$  at takeoff when in sun versus shade. Takeoff by fliers appears to be less dependent on  $T_a$  than it is for perchers. The data also indicate that these perchers from a temperate climate are able to fly at  $T_{th}$ 's lower than those reported for perchers from warmer climates. (Authors).
- (4223) WAAGE, J.K., 1983. Sexual selection, ESS theory and insect behaviour: some examples from damselflies (Odonata). *Fla Ent.* 66 (1): 19-31. — (Div. Biol. & Med., Box G, Brown Univ., Providence, RI 02912, USA).  
The relevance of sexual selection (sperm competition) and ESS (Evolutionary Stable Strategy) to zygopteran behaviour is illustrated with examples of male/female interactions and territorial contests in *Calopteryx maculata*.
- (4224) WELLS, S.M., R.M. PYLE & N.M. COLLINS, [Eds], 1983. *The IUCN invertebrate red data book*. IUCN, Gland, Switzerland. L + 632 pp. [ISBN No. 2-88032-602-X]. — (Orders to: Conservation Monitoring Centre, 219 c Huntingdon Rd, Cambridge CB3 0DL, UK).  
The odon. sp. dealt with (pp. 333-346) in the categories "Endangered" (E), "Vulnerable" (V), and "Rare" (R) are the following: *Hemiphlebia mirabilis* Sel. (E), *Coenagrion freyi* Bilek (E), *Ischnura gemina* (Kenn.) (E), *Epiophlebia laidlawi* (Till.) (V), *Cordulegaster sayi* Sel. (V), *Macromia splendens* Pictet (R), and *Somatochlora hineana* Wlmsn (E). The treatment of each sp. contains the following chapters, "Summary", "Description", "Distribution", "Population", "Habitat and ecology", "Scientific interest and potential value", "Threats to survival", "Conservation measures taken", "Conservation measures proposed", and "References". The list was prepared by the Odon. Specialist Group of the Species Survival Commission, International Union for Conservation of Nature and Natural Resources, and the data and comments on single taxa were furnished by S. Asahina, G.H. Bick, H.J. Dumont, N.W. Moore, D.R. Paulson, and J.A.L. Watson. — (*Abstracter's Note*: it is unfortunate that due to the delay in the preparation of the reports on the Ethiopian and south American faunas, these could not be considered in the present work. For the African fauna cf. *OA* No. 3682, but any evidence on the conservation problematics of the South American fauna is still completely lacking).
- (4225) WYSS, M., 1983. Das seltsame Liebesleben der Libellen. *Vögel d. Heimat*, Einsiedeln 53 (9): 216-217. — (Grauholzstr. 66, CH-3063 Ittigen).  
A general note on mating behaviour, with 3 photographs.