

## ODONATOLOGICAL ABSTRACTS

### 1979

- (6302) ROGOZ, I., 1979. *Ecologia faunei acvatice din Cimpia Olteniei. - Die Ökologie der Aquafauna in der Ebene Olteniens.* Acad. Rep. Soc. România, Bucuresti. 178 pp. (Rom., with Germ. s.). — (Author's address not stated). The aquatic invertebrate fauna and ecology of the Oltenian Plain, Romania are described. The monograph contains various references to the Odon., of which *Platynemis pennipes*, *Calopteryx splendens*, *Gomphus vulgatissimus*, *Onychogomphus forcipatus* and *O. serpentinus* are brought on record.

### 1980

- (6303) RÜPPELL, G., 1980. *Vogelflug.* Rowohlt Taschenbuch Verlag, Reinbek bei Hamburg. 209 pp. ISBN 3-499-17364-6. — (Author: Zool. Inst., Techn. Univ. Braunschweig, Pockelsstr. 10a, D-3300 Braunschweig, FRG). The author is an outstanding student of odon. flight mechanics. This ornithological work is listed here, since it contains a good outline of his professional curriculum (born 1940 in Berlin, at present Professor of Ethology and Ecology at the Univ. of Braunschweig, FRG).
- (6304) WHALLEY, P.E.S., 1980. *Tupus diluculum* sp. nov. (Protodonata), a giant dragonfly from the Upper Carboniferous of Britain. *Bull. Br. Mus. nat. Hist. (Geol.)* 34(4): 285-287. — (Author retired, his current address unknown; — Journal issue available, at £ 11.- net, from: Sales Dept, Brit. Mus. Nat. Hist., Cromwell Rd, London, SW7 5BD, UK).

The genus-group name *Tupus* Sellards (*Am. J. Sci.* (IV) 22: 249-258), unjustly emended by Handlirsch (1919, *Denksch. Akad. Wiss. Wien* 96: 511-592), is restored (cf. also OA 3921, 3933), and *T. diluculum* sp. n. is described and figured from a hindwing, deposited in the BMNH, and recovered from Westphalian A, Bolsover Colliery, Derbyshire, Deep Hard (from roof of seam, 15-17 cm above coal, about 600 m deep). The new sp. is distinct from all other *Tupus* spp. by its large size (estimated wing span over 500 mm); it is the largest known insect from the Westphalian A, certainly the largest of the giant dragonflies, and it is 10-20 million years older than the famous fauna from Commentry, France. So far the genus was known from Russia and the USA only.

### 1981

- (6305) GOGALA, M., 1981. Znanstvenik: delavec brez delovnega časa. — [Scientist: a worker without working-time limits]. *Teleks, Ljubljana* 37(13): 14-16. (Slovene). — (Pot na Tičnico 6, Lukovica, YU-61351 Brezovica). Interview with Prof. M. Gogala, formerly Director of the Inst. of Biol. and Chairman of the Dept of Animal Physiol., Univ. of Ljubljana, Slovenia (Yugoslavia), at present Director of the Slovene Mus. of Natural History, insect physiologist, with odon. vision among his research interests. The text contains 2 passing references to the Odon.

### 1983

- (6306) BELTMAN, B., 1983. *Van de wal in de sloot:*

*een typologisch onderzoek aan makrofauna-coenosen.* — [A typology study on macrofauna coenoses]. PhD. diss., Agric. Univ. Wageningen, 435 pp. (Dutch, with Engl. s. but without Engl. title). — (Dept Plant Ecol., Univ. Utrecht, Lange Nieuwstraat 106, NL-3512 PN Utrecht).

The work deals with the structure of macroinvertebrate communities in the river-clay ditches nr Utrecht, and in the peat ditches nr. Tienhoven, the Netherlands. It contains a list of odon. spp. recorded, but without exact locality data. Only 3 spp. are dealt with in some detail.

- (6307) MacFARLANE, M.B., 1983. Structure of benthic macroinvertebrate communities in a Midwestern Plains stream. *Freshwat. Invertebr. Biol.* 2(3): 147-153. — (Dept Ent., fish. & Wildlife, Univ. Minnesota, St. Paul, Minn. 55108, USA).

Functional group structure of benthic macroinvertebrate communities was compared among 3 distinct reaches of the Redwood R., SW Minnesota, USA. The Odon. (Calopteryx, Argia, Libellula) are only briefly mentioned.

- (6308) YOUNGER, J.G., 1983. Aegean seals of the Late Bronze Age: masters and workshops. II. The first-generation Minoan masters. *Kadmos* 22: 109-136. — (Author's address not stated). This series, published in the int. journal for the pre- and early historic epigraphics aims at dividing Aegean sealstones and rings of the Late Bronze Age, and the sealings they impressed, into stylistic groups, distinguishing their artists and workshops, and giving these data on the basis of examples from stratified deposits, thereby establishing a tighter overall chronology for Late Bronze Age glyptic. — The abbreviations used in this paper are standard, the others are given in the first paper of the series, viz. Betts, J.J. & J.G. Younger, 1982, *Kadmos* 21: 104-121. — The terms "Minoan" and "Mycenaean" are applied to the people of Crete and the Mainland Greece, resp. and by extension, to those artifacts that are proven to have been made by them. The seals are grouped according to shared stylistic traits, i.e. the technical ways in which anatomical and

other features are rendered, the composition of the figures and the shape and materials of the seals themselves. Assemblages of seals with many shared traits may be called the products of certain artists or workshops. — The present paper is a descriptive and commented catalogue of a.o. 3 early Minoan groups of artists, viz.: "The Line-Jawed Lions Group, L-J", "The Cretan Propular Group, CO", and of the "Lesser CP/L-J Artists of Birds and Butterflies". Under the latter group falls the "Master of the Theban Butterflies" (Knossos, Crete; ca. 1500 B.C.), of whom 2 seals are figured and described, showing a butterfly in combination with a dragonfly; No. 47 is from Rutsi, Nr. 51 from Knossos. The author considers the dragonfly figures "fairly realistic". However, fig. 47 represents a neuropteroid-like anisopteran, with long antennae (not unlike some modern pins often sold as "dragonflies!"), while fig. 51 indeed shows a very realistically patterned zygoteran sp. — For a dragonfly depiction of almost the same period in Egypt (XIIIth Dynasty, 1555-1350 B.C.) cf. W. Kruyt, 1969, *Vakbl. Biol.* 49: 82-86; for Sumerian and Akkadian dragonfly references on the Hammurabi cuneiform tablets (ca. 1792-1750 B.C.) cf. *OA* 476.

## 1984

- (6309) MUZLANOV, A.YU., 1984. Differencial'naya smertnost' chetyrehpyatnostoy strekozy v rezul'tate napadeniya beloy tryasoguzki. — [Differential mortality in *Libellula quadrimaculata* caused by the White Wagtail]. *Sbor. Tez. I vsesoyuz. Konf. Probl. Evol., Moskva*, pp. 116-117. (Russ.). — (Luzhkovskaya Shkola, Ryazanskaya Obl., p. Luzhki, USSR). 400 wings, gathered from the left-overs of the meals of *Motacilla alba* were compared with a series of 200 wings from specimens in the population. Measured were the length and width of the wings, and the pterostigma length, the ante- and postnodals were counted, and any aberrations in the venation were noted. As it appears, in the series killed by birds individuals prevailed with relatively small fore wings, with particularly small hind wings, with a small pterostigma, and a high number of crossveins.

Individuals with any aberrations in venation were also more common among the prey than in the control series. *Motacilla alba*, therefore, represents a vector of selection in natural populations of *L. quadrimaculata*.

## 1985

- (6310) ABDU, R.M. & N.F. SHAUMAR, 1985. A preliminary list of the insect fauna of Qatar. *Qatar Univ. Sci. Bull.* 5: 215-232. (With Arabic s.). — (First Author: Dept Zool., Fac. Sci., Univ. Qatar, Doha Qatar).  
*Ischnura evansi*, *Anax parthenope*, *Crocothemis erythraea*, *Diplacodes lefebvrei*, *Orthemis sabina*, *Pantala flavescens* and *Trithemis annulata* are listed from Qatar, Arabian Peninsula. The exact locality data and coll. dates are stated.
- (6311) RONAYNE, C., 1985. *Provisional distribution maps of Odonata in Ireland, May 1985*. Privately published and distributed by the author, Skerries, Dublin. 24 pp. — (33 Dublin Rd, Skerries, Co. Dublin, Eire).  
 This is a collection of distribution maps for 22 spp. known to occur in the Rep. of Ireland (Eire) and in (British) Northern Ireland. The records are plotted on a 10 km grid square and are updated to Apr. 1985. A distinction is made between pre- and post-1961 records. Due to the provisional character of the work, the author requests to get in touch with him before quoting any of the data presented. — (*Abstracter's Note*: Hitherto the Irish records were usually incorporated into the maps of the British Odonata Recording Scheme. For the 2 previously published Irish atlases reference is made to OA 2003 and 2230).

## 1986

- (6312) BORISOV, S.N., 1986. Fauna i ekologiya strekoz (Insecta, Odonata) zapovednika "Tigrovaya Balka". — [Dragonfly fauna and ecology (Odonata, Insecta) of the Nature Reserve "Tigrovaya Balka"]. *Dokl. Akad. Nauk. Tadzhik SSR* 29(9): 560-564. (Russ., with Tadzhik s.). — (E.N. Pavlovsky Inst. Zool. & Parasitol., Tadzhik Acad. Sci., USSR-

-734000 Dushanbe, Tadzhik SSR).

34 spp. are listed from this Nature Reserve in the Vachš Valley, SW Tadzhikistan. Data on larval habitats and on adult phenology are stated for each sp. It is suggested that some of the *Sympetrum fonscolombei* individuals may hibernate at the adult stage.

- (6313) CHINERY, M., 1986. *Collins guide to the insects of Great Britain and western Europe*. 319 pp., ca 1500 col. figs incl. — ISBN 0-00-219170-9 hardback. Collins, London - Glasgow - Sydney - Auckland - Toronto - Johannesburg. — Price: £ 10.95.  
 The aim and scope of the book are the same as those of the previous work by this author, listed in OA 738 and 171. All the col. illustrations (ca 1500) and the text, however are new and in most cases considerably improved. This applies particularly also to the odon. section. The Agriion-Coenagriion nomenclature makes nowadays of course a rather "atavistic" impression. So are some of the "vernacular" names. The introduction of these, and the way they are used in combination with the taxonomic names, do not contribute to the "legibility" of the work. The *Abstracter* is of the opinion that the recent trend of replacing the proper taxonomic names by artificially constructed "vernacular" nomenclature means a serious set-back and in no way facilitates the advancement of species recognition, or that of the reliability of communication of faunistic information. In the present case it is also incomprehensible why e.g. "Agrion virgo" (i.e. a taxonomic name) figures next to the "Banded Agrion" (intended as a "vernacular" name for *Calopteryx splendens*). And, is in Britain the "Gold-ringed dragonfly" (= *Cordulegaster boltonii*) really so much more popular than e.g. *Aeshna cyanea*, of which no "vernacular" name is given?

- (6314) CRUZ, L.F., 1986. Contribucion a los estudios taxonomicos de Odonata-Zygoptera de Colombia: Descripcion de una nueva especie de Cialnalgma (Odonata: Coenagriionidae). *Caldasia* 14(68/70): 743-747. — (Depto Biol., Univ. Javeriana, Aptdo Aéreo 26157, Bogotá, Colombia).

*Cyanallagma demarmelsi* sp. n. is described and figured (holotype ♂, allotype ♀: Sabana de Bogota, 3-IX-1985), and the known members of the genus are keyed. — (*Abstracter's Note*: The generic name, *Cyanallagma*, is erroneously spelled throughout. Further, *lindneri* is in *Argentagrion*, and is a junior synonym of *nepos*. Also *cheliferum* is an *Argentagrion* rather than a *Cyanallagma*. This is a poor paper, and the new sp. should be re-examined and redescribed, if appropriate).

- (6315) DAVIES, M. & J. KATHIRITHAMBY, 1986. *Greek insects*. Duckworth, London. XVIII+211 pp., frontispiece. [ISBN 0-7156-2086-X]. — Price in the UK: £ 24.- net. — (Publishers: The Old Piano Factory, 43 Gloucester Crescent, London, NW1 7DY, UK).

The main part is a comprehensive catalogue of insects mentioned by ancient Greek authors; one of the introductory chapters deals with insects in Greek art, where a selection of artifacts that depict insects is reproduced. On pp. 30-31, the 2 dragonfly seals, as mentioned in *OA* 6308 are reproduced and briefly discussed.

- (6316) GOLUBKOV, S.M., 1986. Sootnoshenie skorstey produktsii i energeticheskogo obmena u lichinok amfibioteskich nasekomyh. — [Relationship between growth and energy metabolism in larvae of aquatic insects]. *Tez. Dokl. V S'ezd. vsesoyuz. gidrobiol. Obschch., Tol'yatti*, pp. 138-140. (Russ.). — (Zool. Inst., USSR Acad. Sci., Universitetskaya nab. 1, USSR-199034 Leningrad).

The relationship between oxygen uptake and development rate in 4 orders was studied. Essentially, this is a modified summary of the paper listed in *OA* 5983. Spp. with high development rate are characterized by high oxygen consumption. The consumption index is specified (for the larvae) as follows: Ephemeroptera 0.235, Odon. 0.159, Trichoptera 0.263, Plecoptera 0.227, with body masses (grams) 0.785, 0.904, 0.818 and 0.767, resp.

- (6317) KRYLOV, P.I., 1986. Kriticheskaya koncentraciya pishchi vodnykh zhivotnykh. — [Critical food concentration in aquatic insects]. *Tez.*

*Dokl. V S'ezd. vsesoyuz. gidrobiol. Obschch., Tol'yatti*, pp. 153-154. (Russ.). — (Author's address not stated).

This is only an abstract of a mathematical presentation, dealing mainly with various marine taxa. 40 "dragonfly larvae" were also considered. Their mean body mass was 42.2 mg, and the critical food concentration is stated as 258 mg/l.

- (6318) NEL, A., 1986. Révision du genre cénozoïque *Stenolestes* Scudder, 1895; description de deux espèces nouvelles (Insecta, Odonata, Lestidae). *Bull. Mus. natn. Hist. nat., Paris* (IV) 8 (C/4): 447-461, pl. 1 incl. (With Engl. s.). — (8. av. Gassion, F-13600 La Ciotat). The genus is revised and keyed, and *S. fischeri* sp. n. (Oligocene of Malvezzy nr Narbonne, France) and *S. camoinsii* sp. n. (Oligocene of Camoins-les-Bains, nr Marseille, France) are described and figured. Their holotypes are in MNHN, Paris. *Megazemum ronzonense* Manval, *Indophae falloti* Théobald, and *Heterophlebia jucunda* Hagen are redescribed and transferred into *Stenolestes*. A morphological novelty is the discovery of a new type of nodus in the Zygoptera. The genera *Oligolestes* and *Stenolestes* are compared.

## 1987

- (6319) AKRAMOWSKI, N.N., 1987. Osobennosti problemy ohrany redkih i ischezayushchih vidov bespozonochnykh zhivotnykh v gornyykh stranah (na primere Armenii). — Peculiarities of the problem of protection of rare and disappearing species of invertebrates in mountainous countries (on the example of Armenia). *Biol. Zh. Armen.* 40(9): 717-722. (Russ., with Armen. & Engl. s's). — (Ul. Marshala Bagratyana 50, kv. 12, USSR-375019 Yerevan, Armenia). The number of endemic, relic or otherwise interesting spp. is relatively higher in the mountainous regions than elsewhere. Usually only some of these are included in the local nature reserves, while some other protective measures are needed to insure the populations of the others. The author has personal experience with the Mollusca and Odon. in Armenia, of

which examples are listed.

- (6320) ALEKSEEV D.S., 1987. Fauna strekoz Srednego Urala. — [Dragonfly fauna of the Central Ural Mts]. In: Fauna i ekologiya nasekomykh Urala, pp. 26-32, Sverdlovsk. (Russ.). — (Author's address given as: Sverdlovsk Inst., Sverdlovsk, USSR).

43 spp. are listed and the fauna is discussed with special reference to human impact on the habitats, incl. thermal pollution by thermal and nuclear power plants.

- (6321) ANSELIN, A., 1987. Sterren en nimfen langs onze beken. — [Calopteryx virgo and C. splendens on our streams]. *Natuur Reservaten* 87(120): 120-121. (Flemish). — (Dienst Recente Vertebr., Kon. Belg. Inst. Natuurwetenschappen, Vautierstraat 29, B-1040 Brussel).  
A note on the distribution of the 2 spp. in Belgium.

- (6322) ASAHINA, S., 1987. A revised description of Schmidtiphaea schmidi Odonata: Euphaeidae. *Proc. Japn. Soc. syst. Zool.* 36: 34-37. — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA).  
Description and figs of the male, based on 4 specimens from northern Thailand.

- (6323) BAKER, R.L. & B.W. FELTMATE, 1987. Development of Ischnura verticalis (Coenagrionidae: Odonata): effects of temperature and prey abundance. *Can. J. Fish. aquat. Sci.* 44(9): 1658-1661. (With Fr. s.). (Dept Zool., Univ. Toronto, Erindale Coll., Mississauga, Ont., L5L 1C6, CA).

Increased food availability increased rate of development within an instar, head width ratio (ratio of headwidth of later instar over head width in previous instar), and weight per unit head width of newly molted larvae, reared in the laboratory. Temperature affected rate of development but not weight per unit head width or head width ratio. Mortality was not affected by any treatment. Rate of development was negatively correlated with both weight per unit head width and head width ratio. Results that the development process has evolved to

reduce risks associated with small size at the expense of a more rapid development.

- (6324) BORISOV, S.N., 1987. Fauna i ekologiya strekoz Tadzhikistana. — [Fauna and ecology of the Tadzhikistan dragonflies]. Autoreferate Kand. Biol. Nauk thesis, Biol. Inst., Siber. Sect., Akad. Nauk SSSR, Novosibirsk. II+24 pp. (Russ.). — (Author: E.N. Pavlovsky Inst. Zool. & Parasitol., Tadzhik Acad. Sci., USSR-734000 Dushanbe, Tadzhik SSR).

This is a (published) summary of the (unpublished) Kand. Biol. Nauk thesis (275 pp., 22 tabs, 53 figs). Most sections are informative, but some are indicative only, while a considerable amount of the presented information has been published previously in the author's papers listed in OA 3438, 4508, 5189, 5495, 5496, 5497, 5508, 5543, 5715. — The history of the odonatol. research in Tadzhikistan is traced from A.P. Fedtschenko's 1868-1871 Turkestan mission (F. Brauer, 1877, in: A. Fedtschenko, Reise in Turkestan 2(5): 4-11) to the present. — The work is based on more than 15,000 specimens and on about 25,000 individuals examined and released. — A list is presented of 59 spp. (incl. an unnamed Calopteryx sp.), of which Sympetrum haritonovi is endemic (cf. OA 4508), while Diplacodes lefebvrei and Trithemis festiva appear, within the USSR, restricted to the Tadzhik territory (cf. OA 3438, 5508). — The vertical distribution is outlined in detail, and 4 altitudinal zones are discerned (300-800, 800-1500, 1500-3000, and above 3000 m). The number of spp. decreases from 1300 m upwards, only 9 spp. still occur at 2800 m. Above 3000 m, Enallagma cyathigerum, Ischnura pumilio, Orthetrum brunneum and Sympetrum haritonovi still breed in thermal waters, while Sympetrum fonscolombei and Pantala flavesens appear there as migrants. — In the original work (but not in the published summary!) the larvae are described of "Calopteryx sp.", Platynemis dealbata, Ophiogomphus obscurus, O. reductus (not in the checklist, therefore perhaps extralimital?), and of Sympetrum haritonovi. — The genus Sympecma is briefly reviewed and 3 spp. (fusca, gobica, paedisca) are recognized. The latter shows pronounced clinal variation,

though only *braueri* is named as a distinct infraspecific taxon. — An attempt is made to tentatively group the spp. in accordance with their larval habitats, life history modes are analysed, and the adult phenology is outlined. The latter is conditioned by the altitude; the flying season lasts all the year round in the valleys, while it is restricted to 2.5 months at the highest elevations. The phenomenon is defined in terms of the prevailing local (mean) temperature. Consequently, *Ischnura pumilio* and *Orthetrum brunneum* are on the wings from March to Nov. in the valleys, from the end of Apr. to the middle of Sept. in the hills, and from July to the middle of Sept. in the alpine zone. — *Crocothemis erythraea* and *C. servilia* are common and they can co-occur. However, they show distinct larval habitat preferences (*erythraea* is more or less stagnicolous, *servilia* prevails in slowly running water), distinct adult phenology (their abundance is similar in Aug., whereafter the numbers of *servilia* increase and those of *erythraea* decrease, until, in certain periods, only 1 sp. is on the wings), and distinct reproductive sites (open waters in *servilia*, dense aquatic and bank vegetation in *erythraea*). It is assumed that the 2 spp. are significantly peculiar in their microclimatic requirements, particularly so with reference to local temperature and air humidity, which circumstance probably facilitates their sympatric distribution. — The autecology of the 6 regional *Ischnura* spp. is dealt with, and data on the absolute abundance of some spp. of both suborders are presented. — In the original work all the Central Asiatic spp. are keyed and the bibliography contains 140 titles, in the published summary, however, only the author's personal odonatol. bibliography is appended. — (*Abstracter's Note*: The work represents an important and welcome addition to the meager literature on the Odon. of the Pamir. It is strongly recommended, however, that the author should depart from the "traditional" nomenclature, which violates the int. Code of Zool. Nomenclature, and that he also should replace the 19th-century system hitherto used in the USSR by one of the available and well documented modern phylogenetic classifications).

- (6325) BORISOV, S.N., 1987. K faune strekoz (Insecta, Odonata) Sary-Chelekskogo zapovednika. — [On the dragonfly fauna of the Sara-Chelek Nature Reserve]. — *Mater. nauchno-teor. Konf. molodyh Uchenykh tadjzhik. SSR* (Biol. & Med.), Dushanbe, pp. 27-29. (Russ.) — (Inst. Zool. & Parasitol., Tadjzhik Acad. Sci., USSR-734000 Dushanbe, Tadjzhik SSR).  
Annotated list of 15 spp., collected in July 1985, in the area of the Sary Chelek Lake (alt. 2000 m) and on the Hodzha-Ata R. (alt. 1300-2000 m), western Tien Shan, USSR.
- (6326) BORISOV, S.N., 1987. Ob ekologii dvuh blizkikh vidov strekoz v Tadjzhikistane. — [On the ecology of two allied dragonfly species in Tadjzhikistan]. *Ekologiya* 1987 (1): 85-87. (Russ.) — (Inst. zool. & Parasitol., Tadjzhik Acad. Sci., USSR-734000 Dushanbe, Tadjzhik SSR).  
The environmental requirements of *Crocothemis erythraea* and *C. servilia* were studied (1978-1982) in SW Tadjzhikistan. These are significantly different in the 2 spp., particularly so with reference to air temperature and humidity. Consequently, their phenology and daily activity patterns are completely different. Detailed data on these are presented.
- (6327) [COUPERUS, B.], 1987. Gekleurde helikopters. 't *Vogelaartje* 1987 (Aug./Sept.): 21-23. (Dutch). — (Parkstraat 7, NL-3581 PA Utrecht).  
A general note on dragonflies, with a good col. phot. of *Enallagma cyathigerum* captured by *Drosera*.
- (6328) DAY, R., 1987. Population dynamics of damselflies at Bookham Common. *Lond. Nat.* 66: 167-184. — (18 Zenoria St., East Dulwich, London, SE22 8HP, UK).  
The populations of 3 ponds were estimated using mark-recapture of adults, 1985-1986. *Coenagrion puella* was found to be twice as abundant as any other zygopt. sp. Data are presented on the lifespan of *C. puella* males, and fluctuations in the observed populations of adult Odon. are discussed. — (For earlier work at this locality, England, UK cf. *OA* 5088).

- (6329) FAIRCHILD, W.L., M.C.A. O'NEILL & D.M. ROSENBERG, 1987. Quantitative evaluation of the behavioral extraction of aquatic invertebrates from samples of sphagnum moss. *Jl N. Am. benthol. Soc.* 6(4): 281-287. — (First Author: Canadian Forestry Service-Maritimes, P.O. Box 4000, Fredericton, New Brunswick, E3B 5P7, CA).  
The difficulty of hand-sorting aquatic invertebrates from sphagnum moss led to the development of a behavioral extraction procedure. The method involves vertical temperature and dissolved oxygen gradients in a column of water with a sphagnum sample immersed at the top. When sphagnum was used as an artificial substrate in Southern Indian Lake, Manitoba, overall extraction efficiency was 85% (SD  $\pm$  1.5%, n=4). Invertebrates in samples from the edge of the floating sphagnum mat surrounding bog ponds in New Brunswick were extracted with an overall efficiency of 75% (SD  $\pm$  15%, n=17). Taxa not extracted by the procedure were represented by an average of fewer than two organisms in samples containing 289 (SD  $\pm$  153) organisms. Efficiencies for the more abundant groups of aquatic invertebrates ranged from 73 to 96% (Odon. 73  $\pm$  19%). Mean sorting time was reduced from > 16 h to < 2 h per sample. The method's high efficiency allows both quantitative and qualitative assessment of aquatic invertebrate populations in sphagnum and other substrates.
- (6330) FELDMANN, R., 1987. *Industriebedingte sekundäre Lebensräume als sicherheitswissenschaftliches Problem. Ein Beitrag zu ihrer Ökologie unter Berücksichtigung hochschuldidaktischer Überlegungen*. Habilitationsschrift Univ. Wuppertal. 259 pp. — (Sole distributor: F. Flück-Wirth, Intern. Buchhandlung, CH-9053 Teufen/AR).  
Considerations on the odon. fauna of gravel-pits in Central Europe (Germany, Switzerland) are given on pp. 158-159, 180-181.
- (6331) FRASERIA. Newsletter of the S.I.O. National Office in India, Pondicherry, No. 13 (Dec. 1, 1987). — (c/o Dr B.K. Tyagi, G-193, Shastri Nagar, Jodhpur-342003, India).  
Due to the change of the address of the SIO Office in India, from Pondicherry to Jodhpur (Rajasthan), the appearance of this issue was delayed and the organisational changes of the Office, as provided for during the 9th Int. Symp. Odonatol. (cf. OA 6180) were not yet implemented. However, as from this issue onwards, Mr M. Mahato (Kathmandu, Nepal) and Mrs A. Tyagi (address as above) have joined the Editorial Board of the Newsletter. — In addition to various administrative communications, the following scientific notes are included: *Kulshrestha, A.K. & B.A. Khan*: Records of certain damselflies from the District Mainpuri, Uttar Pradesh, India (pp. 53-54); — *Tyagi, B.K.*: "Calicnemia doonensis" problem solved [by Dr M. Hämäläinen, Helsinki] (54); — *Prasad, M. & S.K. Ghosh*: On a collection of Odonata from Orissa State (India) (54-55). — Preliminary notifications are given of 2 meetings scheduled, viz. (1) The Southeast Asian Meeting of Odonatology, to be organized by the SIO National Office in Thailand, in conjunction with the SIO Asian Regional Office in India (the data still unfixed); — and (2) The Third Indian Symposium of Odonatology, Erode, Dec. 1989, or Jan. 1990.
- (6332) GATES, T.E., D.J. BAIRD, F.J. WRONA & R.W. DAVIES, 1987. A device for sampling macroinvertebrates in weedy ponds. *Jl N. Am. benthol. soc.* 6(2): 133-139. — (Last Author: Div. Ecol., Dept Biol. Sci., Univ. Calgary, Calgary, Alberta, T2N 1N4, CA).  
A sampler designed to provide simultaneous density estimates of benthic invertebrates found in soft sediments and invertebrates on aquatic macrophytes is described. The sampler consists of a bottom-mounted detachable grab, connected to a box sampler with levered, spring-loaded jaws for cutting macrophytes. The sampler is triggered from above the water, and it simultaneously compartmentalizes mud in the grab and phytomacrofauna in the water column above. Even active aquatic invertebrates are captured by the rapid deployment and triggering of the sampler. Comparison with SCUBA diver clipping of macrophytes indicates that the box sampler component is at

least as precise and, for many species, more accurate. The grab component of the sampler differs little in construction from a normal Ekman grab and has similar accuracy.

- (6333) HARTMAN, M. & U. SCHNEIDT, 1987. Bibliographie zur Fauna des Bezirkes Erfurt. Veröffentlichungen der Jahre 1985/1986, Nachträge 1983/1984. *Erfurt. faun. Inform.* 1987(3): 79-94. — (Naturkundemus., Hospitalplatz 15, DDR-5020 Erfurt, GDR). Contains 6 odonatol. titles.
- (6334) HOESS, R., 1987. Die Libellen der Schweiz. *Mitt. schweiz. ent. Ges.* 60(3/4): 433. [Title only]. — (Normannenstr. 35, CH-3018 Bern). Only the title is recorded of the oral presentation (May 20, 1986) in the meeting of the Ent. Soc. Bern, Switzerland.
- (6335) KOSTERIN, O.E., 1987. Naseleniye strekoz Manzherokskogo ozera. — [Dragonfly population of the Manzherok Lake]. — In: A.N. Tambovcev et al., [Eds], Problemy formirovaniya zhivotnogo naseleniya nazemnykh i vodnykh biocenozov, pp. 76-92, *Znak Pocheta*, Omsk. (Russ.). — (Inst. Biol., Novosibirsk St. Univ., USSR-630000 Novosibirsk). The odon. fauna of the Manzherok Lake (alt. 423 m), on the Katun R., Altai, USSR is described (34 spp.), its biogeographic composition is analysed, and the ecology and population dynamics of some taxa are discussed in considerable detail. (Cf. also OA 6025).
- (6336) ŁABEDZKI, A., 1987. Ważki (Odonata) Świątokrzyskiego Parku Narodowego. — Dragon-flies (Odonata) of the Świątokrzyski National Park. *Fragm. faun.* 31(8): 111-133. (Pol., with Engl. & Russ. s's). — (Katedra Entomologii Leśnej, Wojska Polskiego 71c, PO-60-625 Poznań). 36 spp. were recorded (1975-1981) in the said National Park, representing 51.4% of the Polish odon. fauna and incl. *Ischnura pumilio*, *Epithea bimaculata*, *Sympetrum pedemontanum* and *S. sanguineum* (all are in Poland). The paper is based on 516 larval and 817 adult specimens, gathered at 31 localities. Of particular interest is the description of a *Libellula* quadrimaculata migration (30-V-1981; 42,000 individuals were estimated, flying singly or in small groups at ca 10 m intervals, 1-8 m above the ground). The fauna of different habitats is analyzed, and that of this National Park is compared with those of 4 other major national parks in Poland.
- (6337) LANGE-EICHHOLZ, J., 1987. Vergleichende Untersuchungen zur Libellenfauna einiger Kastentäler im südlichen Pfälzerwald. *Pollichia* 12: 207-220, 1 col. pl. excl. — (Mühlgasse 11, D-7952 Alleshhausen, FRG). The odon. fauna of various streams and running water habitats in the southern Pfälzerwald, FRG is listed and discussed.
- (6338) LÖBNER, K., 1987. Das Naturschutzgebiet "Heissbachgrund von Michelau" — ökologische Bewertung und Pflegevorschläge. *Beitr. Naturk. Wetterau* 7(2): 121-194. — (Sebastianstr. 31, D-5483 Bad Neuenahr, FRG). Contains a list of 10 odon. spp. from a pond in this Nature Reserve, Wetterau distr., Hessen, FRG.
- (6339) MARDEN, J.H., 1987. Maximum lift production during takeoff in flying animals. *J. exp. Biol.* 130: 235-258. — (Dept Zool., Univ. Vermont, Burlington, VT 05405, USA). Maximum lift production during takeoff in still air was determined for a wide variety of insects, incl. several Odon. (*Argia chelata*, *Mecistogaster* sp., *Aeshna canadensis*, *Anax junius*, *Libellula pulchella*, *Sympetrum* sp.). It turns out that clap-and-throw fliers, like Zygoptera, generate much more lift per muscle mass than regular fliers. — (*Abstracter's Note: "Megaloptera"*, listed in the Zygoptera, is not a genus in the Odonata).
- (6340) McPEEK, M.A. & P.H. CROWLEY, 1987. The effects of density and relative size on the aggressive behaviour, movement and feeding of damselfly larvae (Odonata: Coenagrionidae). *Anim. Behav.* 35: 1051-1061. — (First Author: Kellogg Biol. Stn & Dept zool., Michigan St. Univ., Hickory Corners, Mich. 49060, USA). How the aggressive behaviour of the larvae of



*Ischnura verticalis* changed when density and size combinations were manipulated, and whether changes in feeding and movement patterns accompanied changes in aggressive behaviour were investigated in the laboratory. During aggressive encounters larvae struck with their mouthparts at larvae of the same size as themselves more frequently as density increased. However, proportionately fewer encounters occurred between larvae of the same size as density increased and as the size of individuals present, but not involved in the encounter, increased within the highest density. Density did not affect the behaviour used to initiate encounters by larger or smaller larvae, but both larger and smaller larvae initiated proportionately fewer encounters as density increased. All decreased their movement and responsiveness toward prey as larval density was increased and when paired with successively larger instars within each density. However, only the 2 larger instars decreased the amount of prey they consumed in response to the manipulations. Larvae appeared to reduce their involvement in aggressive encounters by increasing their vigilance of other larvae. The potential population consequences of these alterations in individual behaviour are discussed.

- (6341) MICHIELS, N., 1987. De libellenfauna van Den Driel te Mol: uitzonderlijk, maar bedreigd. — [Dragonfly fauna of Den Driel in Mol: exceptional, but threatened]. *Wielewaal* 53: 149-160. (Dutch). — (Dept Biol., Univ. Antwerpen, Universiteitsplein 1, B-2610 Wilrijk). Den Driel is a rich wetland area in Flandres Belgium. The aquatic habitats are threatened by planned corrections of the Schelde-Maas canal, which is the reason for the publication of the present paper. The odon. fauna consists of 37 spp., incl. breeding populations of some spp. that elsewhere in Belgium are rare or threatened (*Gomphus vulgatissimus*, *Cordulegaster boltoni*, *Orthetrum coerulescens*, *Symptetrum pedemontanum*). The spp. are listed, and their records and occurrence are discussed in detail.

- (6342) MILDNER, P. & G.H. LEUTE, 1987. Roman

Puschnig (1875-1962). Leben und Werk. *Carinthia II* (Sonderheft) 46 [Denkschrift Roman Puschnig]: 5-65. — (Landesmus. Kärnten, Museumgasse 2, A-9010 Klagenfurt).

This is a very exhaustive biography, with detailed appreciation of work and a complete bibliography (over 200 titles) of Dr R. Puschnig, medical practitioner in Klagenfurt, Austria, and a well known odonatologist. Among his larger odonatol. works are the fauna of Carinthia (1905-1908), and papers on southern Russia (1911) and Albania (1926). The monograph also includes several portraits and numerous other photographs. Among these are Puschnig's dragonfly book plate, and specimens of *Calopteryx virgo* (Kula Ljums, 26-VI/3-VII-1918, Albania) and *Aeshna caerulea* (Flattnitz, alt. 1390 m, 9-VIII-1928, Austria). His odon. collection is in the Klagenfurt Museum.

- (6343) PEÑA-G., L.E., 1987. *Introducción a los insectos de Chile*. Editorial Universitaria, Santiago. 256 pp.  
The Odon. are dealt with on pp. 81-85. The families are briefly characterised and keyed.
- (6344) ROCHAT, C., 1987. Observation de quelques odonates dans les Pyrénées orientales. *Biol. Elevage Imago Insectes* 27: 1-8. — (Author's address not stated).  
A brief habitat-wise characterisation of the odon. fauna of the Eastern Pyrenees, France, directed at the general reader.
- (6345) RONAYNE, C., 1987. *Provisional distribution maps for Odonata in Ireland*. Irish Odon. Rec. Scheme, Skerries, Dublin. 50 pp. — (33 Dublin Rd, Skerries, Co. Dublin, Eire).  
With reference to the work listed in OA 6311, the maps are considered provisional, since many of the older pre-1961 records had to be temporarily omitted, mainly on account of difficulties in assigning reasonably accurate grid references to "imprecise" records. Mainly for this reason the author requests to get in touch with him before quoting any of the data presented.
- (6346) RÜPPELL, G., 1987. *Lestes viridis* (Lestidae):

- Fortpflanzungsverhalten — Reproductive behaviour. *Publ. wiss. Filmen* (Biol.) 19(21): 1-11. (With Engl. & Fr. s's). — (Zool. Inst., Techn. Univ. Braunschweig, Pockelsstr. 10a, D-3300 Braunschweig, FRG).  
Explanatory text for film No. E-2948 (Inst. Wiss. film, Göttingen; colour, German spoken, 10 min). The film shows the usual and the alternative (male) strategies. Ovipositing tandems are attacked and separated.
- (6347) RÜPPELL, G. & H. HADRY, 1987. *Anax junius* (Aeschnidae): Eiablage und Konkurrenz der Männchen um die Weibchen. *Publ. wiss. Filmen* (Biol.) 19(22): 1-12. (With Engl. & Fr. s's). — (Zool. Inst., Techn. Univ. Braunschweig, Pockelsstr. 10a, D-3300 Braunschweig, FRG).  
Explanatory text for film No. E-2998 (Inst. Wiss. Film, Göttingen; colour, no voice, 16 mm, 14.5 min). The film shows patrolling males and ovipositing tandems. The latter are attacked by males (collision, pulling, biting). The tandem male defends itself (wing beating, clinging to plants, shaking off the attackers). also included are the separation of tandems by attackers (during oviposition), and air attacks, following by the tandems falling and drowning.
- (6348) SAVARD, M., 1987. [Errata]. *Fabrerries* 13(2): 40. (Fr.). — (184 av. Eymard Nord, Alma, Qué., G8B 5H9 CA).  
Didymops traversa is added to the 29 spp. as listed in the paper mentioned in OA 5816.
- (6349) SCHNEIDER, W., 1987. *Tübinger Atlas des Vorderen Orients (TAVO) A VI 12. Levante-Hydrofauna / Levant-Freshwater fauna. III. Odonata / Libellen / Dragonflies*. Reichart. Wiesbaden — [3-88226-912-X]. — (Fisheries Dept, Food & Agric. Organization, Via delle Terme di Caracalla, I-00100 Roma).  
This is a commercially available col. map of the odon. distribution in the Levant (scale 1: 3.000.000, status May, 1986). The distribution is shown of 20 spp. of Calopterygidae, Coenagrionidae, Aeshnidae, Gomphidae, and Libellulidae. For the comments, reference is made to the work listed in OA 5818.
- (6350) SEKI, T., S. FUJISHITA, M. ITO, N. MATSUOKA & K. TSUKIDA, 1987. Retinoid composition in the compound eyes of insects. *Exp. Biol.* 47(2): 95-103. — (First Author: Dept Health Sci., Osaka Kyoiku Univ., 1-6-7 Nagare-machi, Hirano-ku, Osaka, 547, JA).  
Retinoids in the compound eyes of insects in ten orders were extracted by the oxime method and analysed by HPLC. Four geometrical isomers (13-cis, 11-cis, 9-cis and all-trans) of syn and anti retinal oximes, and syn and anti 3-hydroxyretinal oximes were separated in a single analysis by a stepwise eluent condition. The amounts of the two isomers, syn 11-cis and syn all-trans, were quantified. 11-cis 3-hydroxyretinal was detected in six orders: Lepidoptera, Diptera, Coleoptera, Neuroptera, Hemiptera and Odonata, and retinal and 3-hydroxyretinal were found together in the compound eyes of some species of Coleoptera and Odonata. It is concluded that early in their phylogeny, insects had the ability to use 3-hydroxyretinal as the chromophore of visual pigment. Peaks corresponding to syn 9-cis and 13-cis 3-hydroxyretinal oximes were observed on the chromatogram of extracts from fly heads and compound eyes of cicadas.
- (6351) *SYMPETRUM*, Revue d'Odonatologie. Vol. 1, No. 1 (1987). Published by the Groupe de recherche et de protection des libellules, "Sympetrum", Grenoble, France. Annual subscription for 1987: fFr. 50.-. (Fr., with Engl. s's). — (Orders to: G.R.P.L.S., 97 rue St. Laurent, F-38000 Grenoble).  
A cheaply, but nicely produced, and well edited journal of A5 size is scheduled to appear at least once annually, but the frequency will be increased with the increase of the volume of submitted manuscripts. It publishes papers related (in the broadest sense) to the conservation of the West Palaearctic Odon., and publication is open to all. — The first issue (76 pp.) contains 6 papers, viz.: *Deliry, C. & D. Loose*: Notes odonatologiques de Grèce et de Yougoslavie (pp. 3-22); — *Faton, J.M.*: Les libellules de la Drôme (23-29); — *Loose, D.*: Première liste commentée des Odonates en Isère (31-50); — *Deliry, C.*: Bilan et per-

spectives des observations d'Odonates en Savoie et Hte Savoie (51-68); — Les Sympecma (Odonata) sont-ils les seuls à hiberner en Europe? (69-74); — Auzière, C.: Cannibalisme chez les imagos (Odonata): comment disparaît la tête de la victime? (75).

- (6352) WHITE, H.B., III, 1987. Dragons, damsels and darning needles. *Delaware Conservationist* 30(2): 28-31. — (Dept Chem. & Biochem., Univ. Delaware, Newark, DE 19716, USA).  
A popular article on the Odon. of Delaware, USA, with col. phot. of Calopteryx maculata, Libellula needhami, L. pulchella and Symptetrum ambiguum. A phot. of the exuviae of Anax junius is inverted. Of particular importance is a reference to a population of Gomphus rogersi on the coastal plain in Delaware.

## 1988

- (6353) AGOPIAN, S. & L.M. MOLA, 1988. Intra and interspecific karyotype variability in five species of Libellulidae (Anisoptera, Odonata). *Caryologia* 41(1): 69-78. — (Second Author: Lab. Genet., Depto Cien. Biol., Univ. Buenos Aires, Ciudad Universitaria, AR-1429 Buenos Aires).  
5 spp. from various Argentine localities were studied. Pantala flavescens (Fabr.), Erythemis attala Sel. and Micrathyrina hypodydima Calv. have  $n=12+X$  and present m chromosomes. Brachymesia furcata Hag. also has  $n=12+X$ , but without m chromosomes and the presence of a clearly heteromorphic autosomal bivalent was a constant feature in all individuals. Micrathyrina longifasciata Calv. has  $n=12$ , with a neo-XY sex determining system and it presents a larger autosomal bivalent. Comparison of the results obtained for P. flavescens, E. attala, M. hypodydima and B. furcata with studies performed by others on non-Argentinian populations showed karyotype differences as well as interspecific differences in the genus Micrathyrina.
- (6354) ASAHINA, S., 1988. [Enigmas of Matsumura's "Thousand insects of Japan" series]. *Gekkan Mushi* 205: 19-25. (Jap.). — (Taka-

danobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA).

[Abstract not available].

- (6355) ASAHINA, S., 1988. ["Gomphus tricolor" and "Gomphus chichibui"]. *Nature & Insects* 23(3): 45-46. (Jap.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA).  
Historical notes on the 2 taxa, with a facsimile of a handwritten letter by F.C. Fraser (July 15, 1950), depicting the diagrams of the markings of G. chichibui Fraser and G. melampus Sel.
- (6356) ASAHINA, S., 1988. Taxonomic notes on North Indian "Onychogomphus bistrigatus" and its allies. *Gekkan Mushi* 209: 11-17. (Jap., with a very detailed Engl. s., Engl. fig. captions, and 2 pp. of Engl. text on the material examined). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA).  
After F.C. Fraser (1937, *Proc. R. ent. Soc. Lond.* (B) 6: 161-164), it is emphasized again that Onychogomphus m-flavum (Sel. 1894) is a synonym of O. bistrigatus Hag., 1854. The latter is closely allied to O. schmidtii Fraser, 1937. The 2 spp. are described and figured, and the description and figs of the allotype female of the related O. dingavani Fraser, 1924 are added.
- (6357) ASKEW, R.R., 1988. *The dragonflies of Europe*. 294 pp., incl. 31 col pls, 502 text figs, 116 maps. ISBN 0-946589-10-0. Harley Books, Martins (Essex). — 29x21.2 cm, hard cover, dust wrappers — Price in the UK: £ 51.95. — (Author: Dept Zool., Univ. Manchester, Manchester, M13 9PL, UK). — Available from the SIO Central Office, Bilthoven.  
At variance with the numerous books and field guides that were recently published on the European Odon., this is a standard handbook, a top-quality work, aiming at professionals and amateurs alike, covering the geographical Europe up to approx. the Crimea, but not considering the Caucasus. — The Introductory section includes chapters on History; Life History (larval biology, larval development, adult emergence); the Adult Dragonfly (behaviour, temperature relations, longevity, natural enemies, dispersal); the Dis-

tribution of European Dragonflies; Morphology of the Adult Dragonfly; and Keys to the suborders and families of the European fauna. The Systematic section gives keys to the genera and spp. (larvae and adults). Each sp. is described and details on the biology, phenology and distribution are provided (incl. a map for each sp.). Some synonyms are also given and the type localities are stated. The Bibliography contains some 600 titles. 29 col. pls, comprising 210 individual figs (all enlarged), depict both sexes of most spp. and their different col. forms, all by Dr Askew. 2 col. pls are photographs, illustrating odon. biology and habitats. — The idea for this work was born in 1976, it took 9 years to complete it, incl. about 5 days on average for each of the watercolour drawings. Most of the latter are of superb quality. The Foreword was contributed by Prof. P.S. Corbet. — This is, in all aspects, the finest work yet produced on the European Odonata, reflecting our knowledge on the subject up to and incl. early 1987. Glancing through it, the Abstracter is hardly able to offer any tentative suggestions that could be considered for a possible improvement of a second edition. In many cases the infraspecific taxa of a number of European spp. are at present neither well defined nor well understood, therefore it seems appropriate that not all of them are mentioned in this work. Some of those that are, will probably not always be easily identified with the information presented (e.g. *Calopteryx*, where in the pls a *C. virgo meridionalis* is shown as "*C. virgo*"; etc.). Somewhat amazing is the introduction of a peculiar "*Nehalenniinae*" (p. 49), in which subfamily the coenagrionine *Nehalennia* and the pseudagrionine *Ceragrion* are listed, without any comment or explanation. The list of the principal works on the fauna of different countries/regions, on p. 38, would need some amendments and additions, e.g. the incidental 1937 note by Cowley on Latvia should be replaced either by Spuris's 1956 monograph, or by his revised catalogue of 1980; the review works on the other Baltic States are not mentioned; for Switzerland the 1981 annotated checklist should better replace the cited regional papers; some countries, like

Denmark, Poland and Portugal are omitted; etc. — Needless to say, these minute "deficiencies" in no way diminish the value of the work, which definitely is a "must" in every odonatological library.

- (6358) BAKER, R.L., 1988. Effects of previous diet and frequency of feeding on development of larval damselflies. *Freshw. Biol.* 19: 191-195. — (Dept Zool., Univ. Toronto, Erindale Coll., Mississauga, Ont., L5L, 1C6, CA). Food availability during instar F-3 affected duration of instar F-3 of larval *Ischnura verticalis* (Say) maintained in the laboratory but did not affect the increase in head width at the moult to instar F-2. — Food availability during instar F-2 altered both duration in instar F-2 and weight per unit head width of newly moulted F-1 larvae, but not the increase in head width at the moult to instar F-1. — Food availability during instar F-3 had no effect on instar duration, weight per unit head width, or increase in head width of F-2 larvae at the moult to instar F-1. — Survival of larval *Coenagrion resolutum* (Hag.) reared in the laboratory was dependent on mean number of *Daphnia* offered per day. In addition, larvae fed less frequently, but on the same mean number of *Daphnia* per day, had lower survival rates than larvae fed more frequently.
- (6359) BELLE, J., 1988. A record of the Old World species *Tramea basilaris burmeisteri* Kirby from Surinam (Odonata: Libellulidae). *Zool. Meded.* 62(1): 1-3. — (Onder de Beumkes 35, NL-6883 HC Velp). A single male, identical to the S. African specimens in the Brussels Mus. and taken Dec. 18, 1973 at the Zanderij international airport, Paramaribo, Surinam, is brought on record, figured and described, and its possible provenience is briefly discussed.
- (6360) BELLE, J., 1988. A synopsis of the species of *Phyllocycla* Calvert, with descriptions of four new taxa and a key to the genera of neotropical Gomphidae (Odonata, Gomphidae). *Tijdschr. Ent.* 131: 73-102. — (Onder de Beumkes 35, NL-6883 HC Velp). A synopsis is given of the 30 spp. of the genus,

- supplied by descriptive notes and additional figures. An attempt is made to classify the spp. into groups, based on adult male characters. A key to these groups and to the males is provided. 4 new spp. are introduced, viz. *P. brasilia* (♂ holotype: Brazil, State of Sergipe, Propriá), *P. medusa* (♂ holotype: Brazil, State of Pará, Santarem), *P. foliata* (♂ holotype: Argentina, Province of Misiones, Apepú), and *P. murrea* (♂ holotype: Brazil, State of Sergipe, Propriá). Their genitalia and thoracic colour patterns are depicted, and the affinities and variations discussed. Neotypes are designated for *P. elongata* (Selys in Selys & Hagen) and *P. gladiata* (Hagen in Selys). *P. sordida* (Selys) is figured for the first time. The previously unknown females of *P. diphylla* (Selys) and *P. hespera* (Calvert) are described. Newly obtained material is recorded. A key to the genera of neotropical Gomphidae is given in an appendix.
- (6361) BIEDERMANN, J., 1988. Die Riedlandschaft Schwabbrünnen-Äscher — unser erstes liechtensteinisches Naturschutzgebiet. *Berg-heimat* 1988: 7-32. — (Blachastr. 78, FL-9494 Planken).  
This is a general description of the ecology and animal world of the Nature Reserve, the odon. fauna of which is reported in detail in the paper listed in OA 6214. It also contains a chapter on, and several col. phot. of the local Odon.
- (6362) CANNINGS, R.A., 1988. [Book review]. Miller, P.L., 1987, Dragonflies. *Bull. ent. Soc. Can.* 20(2): 8. — (Ent. Div., Roy Brit. Columbia Mus., Parliament Bldgs, Victoria, B.C., V8V 1X4, CA).  
Book review of the volume listed in OA 6031.
- (6363) [CANNINGS, R.A.], 1988. [Profiles]. Frank Whitehouse. *Boreus* 8(1): 3. — (Div. Biol. Roy. Brit. Columbia Mus., 601 Belleville St., Victoria, B.C., V8V 1X4, CA).  
A brief biographic sketch of this well known British Columbia odonatologist (1879-1959), mainly based on the biography published by G. Spencer (1963, *Proc. ent. Soc. Br. Columbia* 60: 52), but containing also an autobiographic note by R.A. Cannings.
- (6364) CHANDLER, P.J., 1988. [Book review]. Dragonflies. By Peter L. Miller, with plates by Rupert Lee. *Br. J. Ent. nat. Hist.* 1(1): 14. — (Author's address not stated).  
Book review of the volume listed in OA 6031.
- (6365) CHRISTIES, 1988. De kunst van het veilen. — [The art of auction]. *NRC Handelsbl., Rotterdam* 18(271): 6, issue of Aug. 18. (Dutch).  
A commercial advertisement by the well known international auctioneer, in a Dutch daily, showing a dragonfly pin, said to have been sold on May 12, 1988 in Geneva, Switzerland, at sFr 46.200.-.
- (6366) CLAUSNITZER, H.-J., 1988. Die Libellen (Odonata) des Landkreises Celle (Niedersachsen). *Beitr. Naturk. Niedersachs.* 41: 96-103. — (Eichenstr. 11, D-3106 Eschede, FRG).  
The odon. fauna (49 spp.) of the Celle distr., Lower Saxony, FRG is listed and its ecology is discussed with reference to the types of larval habitats (incl. fishponds).
- (6367) COLLINS, [N.] M., 1988. Legislation of insects. *Bull. amat. Ent. Soc.* 47(359): 53-55. — (IUCN Conserv. Monit. Cent., 2190 Huntingdon Rd., Cambridge, CB3 0DL, UK).  
This is a supplement, updating the publication listed in OA 6006. As far as the Odon. are concerned, the paper presents the list of the 16 spp. that were placed (Dec. 1987) on Appendix II of the Berne Convention (cf. OA 6273), and a reference is made to the Act, promulgated by the government of the Austrian province of Styria (May 25, 1987), by which all the odon. spp. were put under "protection" in that province.
- (6368) CORBET, P.S., 1988. Foreword. In: R.R. Askew, The dragonflies of Europe, p. 7. Harley Books, Martins (Essex). — (The Old Manse, 45 Lanark Rd, Edinburgh, EH14 1TL, Scotland, UK).  
Cf. OA 6357.
- (6369) CORDERO, A., 1988. Estudio ecológico de una población de *Lestes viridis* Vander Linden, 1825 (Zygoptera, Lestidae). *Limnética* 4: 1-8. (With Engl. s.). — (Depto Ecol., Fac.

Biol., Univ. Santiago, ES-15071 Santiago de Compostela).

A population of *L. viridis* was studied by means of capture/recapture and by collection of exuviae in a man-made pond nr Pontevedra, NW Spain. The main emergence period was restricted to 8 June-29 July, with a maximum between 9 and 13 July (38%). 74% of exuviae were found at 6-20 cm above water surface. The mature period lasts approx. 30 days, and the maximum longevity amounts to 77 and 63 days for ♂ and ♀, resp. The adult sex ratio at water deviates significantly from 1:1 (65% ♂), but 1:1 was found at emergence. The numbers of individuals at the waterside show a diurnal rhythm, with the maximum reproductive activity between 12.30 and 14.00 solar time.

- (6370) DE JONG, M., 1988. *Struktur van de testis der Odonata*. — [Structure of the odonate testis]. M. Sc. thesis, Dept Anim. Cytogenet. & Cytotaxon., Univ. Utrecht. IV+22 pp. (Dutch). — (Minstraat 56 bis, NL-3582 CD Utrecht).

The histology and ultrastructure of the adult testis of *Ischnura elegans* are described and documented with light and electron micrographs.

- (6371) DE MARMELS, J., 1988. Odonata del estado Táchira. *Revta cient. Unet* 2(1): 91-110. (With Engl. s.). — (Depto & Inst. Zool. Agric., Fac. Agron., Univ. Central Venezuela, Apdo 4579, Maracay-2101-A, Venezuela).

A synopsis is presented of the odon. fauna hitherto known from the State of Táchira, western Venezuela (107 spp. and ssp., 14 of which are new to Venezuela). *Cyanallagma tamaense* sp. n. (holotype ♂: Páramo El Tamá, alt. 2250-2450 m, 17/20-III-1983) is described and figured. "*Podagrion*" *oscillans* Sel. and "*P.*" *temporalis* Sel. are redescribed. For the latter a lectotype is designated. Morphological features and taxonomic status of more than 10 little known spp. are discussed, and 4 taxa of the "ferruginea-group" of *Orthemis* are keyed.

- (6372) DE MARMELS, J., 1988. *Sympetrum ro-raimae* spec. nov. vom venezolanischen Guyana-Hochland (Odonata: Libellulidae). *Opusc.*

*zool. flumin.* 28: 1-6. (With Engl. s.). — (Depto & Inst. Zool. Agric., Fac. Agron., Univ. Central Venezuela, Apdo 4579, Maracay-2101-A, Venezuela).

The new sp. is described and figured from 3 ♂ and 2 ♀ (holotype ♂: Venezuela, Bolívar, Kukenam alt. 2100 m, 12/17-IV-1988; deposited at I.Z.A., U.C.V., Maracay). It is superficially similar to *S. illotum gilvum* (Selys) from which it can be separated by its smaller size, the shape of the secondary genitalia, the caudal appendages and by wing venation.

- (6373) DE RICQLES, A., 1988. Les odonates de Dordogne et leur intérêt comme indicateurs de l'évolution des milieux à moyen terme. *Revue Ecol. (Terre Vie)* 43: 177-194. (With Engl. s.). — (2, place Jussieu, F-75251 Paris-Cedex 05). The long-term monitoring to the odon. community of Dordogne, France indicates that dragonflies can indeed be used as "ecological indicators". It seems possible to correlate the local changes in distribution and abundance of the adults with the recent man-made modifications of the biota. The odon. reactions to the environmental changes are species specific, and are mainly the result of the larval ecology. The implications of this evidence for the management of the local biota are discussed.

- (6374) DIXON, S.M. & R.L. BAKER, 1988. Effects of size on predation risk, behavioural response to fish, and cost of reduced feeding in larval *Ischnura verticalis* (Coenagrionidae: Odonata). *Oecologia* 76: 200-205. — (Second Author: Dept Zool., Univ. Toronto, Erin-dale Coll., Mississauga, Ont., L5L 1C6, CA). Laboratory studies were used to examine the importance of predation risk and cost of anti-predator behaviour in determining the behavioural response of several larval instars of *Ischnura verticalis* to a fish predator (*Lepomis gibbosus*). Smaller larvae were less susceptible to fish predation than larger larvae. Smaller larvae depressed movement to a greater degree in the presence of fish than did larger larvae; large larvae were generally less active than smaller larvae regardless of fish presence. Reduced feeding resulted in smaller larvae suffering more in terms of reduced growth than

did large larvae. In general, the results tend to support the hypothesis that individuals that suffer high costs of antipredator behaviour but little risk of predation may only exhibit anti-predator behaviours in the presence of predators, whereas individuals with a higher risk of predation and a lower cost of anti-predator behaviour may evolve anti-predator mechanisms that are in effect even in the absence of predators.

- (6375) DUNN, R., 1988. 1987 dragonfly (Odonata) report. *Quart. J. Derbyshire ent. Soc.* 1988 (Spring): 26-27. — (4 Peakland View, Darley Dale, Matlock, Derbyshire, DE4 2GF, UK). Noteworthy 1987 Derbyshire (U.K.) records, among which a small breeding population of *Leucorrhinia dubia* is of more than local interest, being only the eighth known population of this sp. in England.
- (6376) EVANS, M.A., 1988. Checklist of the Odonata of Colorado. *Great Basin Nat.* 48(1): 96-99. — (Dept Ent., Colorado St. Univ., Fort Collins, Col. 80523, USA). 101 spp. are recorded for Colorado, of which 4 Anisoptera and 9 Zygoptera are new state records. County records are indicated for each sp. 3 major elements are recognized: (1) predominantly eastern spp. occurring in the plains and mountain valleys E of Rocky Mts, (2) Canadian Zone elements occurring principally above 2440 m in the mountains, and (3) Great Basin and western spp. occurring chiefly W of the mountains. The list is based primarily on the collections at Colorado St. Univ. and the Univ. of Colorado, with additional records from the literature and from other collections.
- (6377) GIESEN, T.G. & M.H.J. GEURTS, 1988. De Weidebeekjuffer (*Calopteryx splendens*; Odonata) in de Oude IJsselstreek. De hydrobiologie van de Oude IJsselstreek, X). — Die Gebänderte Prachtlibelle in der Gegend der "Oude IJssel". *Natuur & Landschap Achterhoek Liemers* 2(3): 71-76. (Dutch, with Germ. s.). — (Van Roggenstraat 8, NL-7011 GE Gaanderen).  
In the Netherlands, in the past decades, there was a significant decline of the number of populations of *C. splendens*. Recently, however, the water quality generally improved considerably. Consequently, this sp. became more common again. In the "Oude IJssel" area it occurs at 14 out of 21 localities examined. The O<sub>2</sub> contents there is 10 mg/l or higher, and on average 7.8 males were counted per 100 m length of the stream. Solitary males and females were noticed at distances of up to 1 km from the nearest standing population. The habitats are mapped and their ecology is described in detail.
- (6378) GROEPLER, W., 1988. Embryonalentwicklung von *Libellula depressa*. *Mikrokosmos* 77(8): 245-250. — (Abt. Biol., Pädagog. Hochschule, Bismarckstr. 10, D-7500 Karlsruhe, FRG).  
The embryology of *Libellula depressa* is described and photographically documented from cleavage to the emergence of the prolarva.
- (6379) GÜNZEL, W.R., 1988. "Sie können nicht aus ihrer Haut". *Fotografie draussen* 1988(4): 10-11. — (Lange Fuhr/Ecke Ballenpfad, D-5303 Bornheim-Walberberg, FRG).  
A general note on the status of some odon. spp. in Germany, directed at insect photographers.
- (6380) [HEIERLI, H.], 1988. Naturmuseum. *Jber. Stif. st. gall. Mus.* 9[1987]: 24-27. — (Naturmus., Museumstr. 32, CH-9001 St. Gallen). In the Director's annual report, reference is made to the odon. collection of Dr Franz Wüst (Wald/AR, Switzerland) donated to the Nat. Hist. Mus. of St. Gallen in 1987.
- (6381) hsr., 1988. Libellenforschung in der Schweiz. *Neue Zürcher Ztg.* 1988(70): 23, issue of March 24. — (c/o Dipl.-Zool. C. Meier, Gibel Bannholz, Postfach 252, CH-8636 Wald).  
A newspaper report on the First Symposium of Swiss odonatologists (Zürich, March 23, 1988) and on the foundation of the "Schweizerische Gesellschaft für Libellenkunde". — For a detailed account cf. *Selysia* 17(2): 11 (1988).
- (6382) IRISH ODONATA RECORDING SCHE-

*ME NEWSLETTER*, No. 1 [Not stated] (May, 1988). — (Compiled by, and available from the National Organizer, Mr C. Ronayne, 33 Dublin Rd, Skerries, Co. Dublin, Eire/Rep. Ireland).

The highly informative issue updates the Irish records of the last few years, comments on distribution patterns of various spp., and brings some suggestions for future research. The spp. discussed in detail are *Coenagrion lunulatum*, *Calopteryx virgo*, *C. splendens*, *Cordulia aenea* and *Somatochlora arctica*. — (*Abstracter's Note*: visitors to the Republic of Ireland and/or to British Northern Ireland are requested to communicate their records to the National Organizer at the above address).

- (6383) ISHIDA, S., 1988. The Odonata larvae, with special reference to the life mode and their morphological type. *Nature & Insects* 23(7): 14-18. (Jap., with Engl. title). — (2-8, Okinoshima-cho, Yokkaichi-shi, Mie Pref., 510, JA). [Abstract not available].

- (6384) ISHIDA, S., K. ISHIDA, K. KOJIMA & M. SUGIMURA, 1988. *Illustrated guide for identification of the Japanese Odonata*. Tokai University Press. VIII+140 pp. + 105 pp. (pictorial key) + 72 col. pls. Hard cover + flappers. ISBN 4-486-01012-4. — Price in Japan: ¥ 13,000.-. (Jap., with Engl. title and Latin taxonomic names). — (Orders accepted by the SIO Central Office, Bilthoven; delivery time about 3 months).

After the book by S. Ishida (cf. *OA* 2869) and the magnificent volumes by K. Hamada & K. Inoue (cf. *OA* 5245), both of which are out-of-print (though a few sets of the latter are still available from the SIO Central Office), this is the third commercially available "handbook" on the Odon. of Japan. Amazingly, it is completely different from the previous 2 works, but it will adequately serve for the identification of the spp. At a glance, the book appears a "combination" between S. Ishida & Y. Hamada's photographic (1973) work (cf. *OA* 583) and Ishida's above mentioned treatment in the *Insects' life in Japan* series. — The 72 col. pls of the first part consist of 383 field photographs, representing most Jap. spp. and sspp., supple-

mented by a pl. of specimen photographs and by 2 pls showing 30 larvae in their natural environment. The quality of all of these is "excellent" to "superb". The second part (with a separate pagination and in a (somewhat unusual) green print, is a pictorial key to the adults (pp. 1-57), an atlas of the ultimate instar larvae (pp. 58-77), and a pictorial key to the larvae (pp. 78-105). It is unfortunate that in the keys only the Japanese names are used, while along with these the taxonomic names are employed in all other sections of the book. The 140 pp. of the third part mainly contain descriptions of, and other relevant information on all the spp., 16 pp. having been reserved for a brief outline of the general biology. — Only very few words are needed about the authors. Shozo Ishida (2-8, Okinoshima-cho, Yokkaichi-shi, Mie Pref., 510) is a famous name in Japanese odonatology. Aside from his above listed books and numerous technical papers, his 1982 dragonfly book, directed at the youth, should be certainly mentioned here (cf. *OA* 4257). Katsuyoshi Ishida (Biol. Lab., Nagoya Women's Univ., Takamiya-cho, Tenpaku-ku, Nagoya, 468) is the son of the former, a graduate of Ehime Univ., and an authority on Japanese odon. larvae (cf. e.g. his important treatment of this subject in the work listed in *OA* 5396). Among the better known odonatol. publications by Keizo Kojima (Fac. Agric., Kochi Univ., Nangoku-shi, Kochi-kan) are e.g. the descriptions of the larva of *Boninagrion ezoin* and of some other spp. from the Ogasawara Islands (cf. *OA* 921). The fourth author, Mitsutoshi Sugimura (9-7, Uyama-satsuki-cho, Nakamura, Kochi Pref., 787), without any exaggeration, could be considered a unique "phenomenon" in modern odonatology. Nationally he is well known through his various books (*OA* 5172, 5410, 5990), numerous papers, dragonfly movies and, above all, through his unique "Tombo Museum" and his small dragonfly periodical while he became famous throughout the world through "his" Dragonfly Sanctuary in Ikedadani (Nakamura, Shikoku), set up in 1985 with financial aid from the WWF. (cf. e.g. *OA* 6037). — In short: a book, jointly produced by authorities of such a standing, cannot fail to be "impressive".



- (6385) KETELAAR, R., 1988. Zweefvliegen en andere insekten in de Eendekooi te Castricum. — [Hoverflies and other insects in the Eendekooi at Castricum]. *Stridula* 12(1): 14-19. (Dutch). — (Melis Stokelaan 14, NL-1911 SL Uitgeest).  
*Ischnura elegans* and *Lestes viridis* are reported from this locality, Noord-Holland prov., the Netherlands.
- (6386) KIM, C.-W., C.E. LEE & B.-H. LEE, 1988. Insect systematics in Korea. *Korean J. Ent.* 18(2): 109-118. (With Korean s.). — (First Author: Korean Ent. Inst., Korea Univ., Seoul 136-701, Korea).  
 The subject is traced from 1443 until present, and 3 periods are distinguished in the history of systematics in Korea. Between 1958-1986, 15 papers on odon. systematics have been published in Korea, and there were 4 odon. taxonomists there. The bibliography and the names of the workers are not listed.
- (6387) KOMNICK, H., 1988. Intestinal absorption of defined lipids by the larval dragonfly *Aeshna cyanea* (Insecta, Odonata): free and esterified oleic acid. *Europ. J. Cell Biol.* 46(1): 3-8. — (Inst. Cytol., Univ. Bonn, Ulrich-Haberland-Str. 61a, D-5300 Bonn-1, FRG).  
 Absorptive transport of triglyceride across the enterocytes was studied by thin-layer chromatography and light microscopy after oral infusions of free and esterified oleic acid. The digestive enzymes secreted by the absorptive cells hydrolyzed the artificial substrates triolein, diolein, monoolein and oleic acid ethyl-ester as well as natural acylcholesterol and triglyceride of undefined fatty acid composition. Oleic acid was identified as an absorbate entering the cells via direct permeation of the apical plasma membrane. Its absorption led to the synthesis of triglyceride that was accumulated in matrix lipid droplets of the enterocytes. — Diglyceride, triglyceride and phosphatidylcholine associated with plasma proteins were the major transport forms of fatty acids in the hemolymph.
- (6388) KOMNICK, H., 1988. Intestinal absorption of defined lipids by the larval dragonfly *Aeshna cyanea* (Insecta: Odonata): mono- and polyunsaturated free fatty acids and their homotriglycerides. *J. Insect Physiol.* 34(2): 105-110. — (Inst. Cytol., Univ. Bonn, Ulrich-Haberland-Str. 61a, D-5300 Bonn-1, FRG).  
 A total of 26 even-numbered unsaturates of chain lengths between C14 and C24 were screened for their enteric absorption by the larvae. These included 14 cis- and 3 trans-monoenoics, 7 cis-polyenoics with up to 6 double bonds, and 2 trans-dienoics which were orally administered either as free acids or/and as homotriglycerides. 1 and 2 days after ingestion the enterocytes contained more or less heavy accumulations of lipid droplets indicating that the tested unsaturates were readily absorbed by this species irrespective of chain length, number, position and configuration of double bonds. The equal utilization of free fatty acids and triglycerides, the digestion of trinovonin as tested by TLC, and the morphology of absorption suggested that the 12 different unsaturated triglycerides examined were taken up according to a common mechanism involving luminal lipolysis and cellular resynthesis.
- (6389) KRUPP, F. & W. SCHNEIDER, 1988. Die Süßwasserfauna des Vorderen Orients: Anpassungsstrategien und Besiedlungsgeschichte einer zoogeographischen Übergangszone. *Natur & Mus., Frankfurt/Main* 118(7): 193-213. — (Second Author: Fisheries Dept, Food & Agric. Organization, via delle Terme di Caracalla, I-00100, Roma).  
 Biogeographic history of the Middle East, with numerous references to the Odon. Col. phot. of 6 regional spp. and a drawing of the larva of *Lindenia tetraphylla* are also included.
- (6390) LEMPERT, J., 1988. *Untersuchungen zur Fauna, Ökologie und zum Fortpflanzungsverhalten von Libellen (Odonata) an Gewässern des tropischen Regenwaldes in Liberia, Westafrika*. Diplomarbeit, Univ. Bonn. VI+238 pp., 65 figs (numerous col. phot.) incl. — (Author: Prinz-Albert-Str. 38, D-5300 Bonn-1, FRG).  
 This M. Sc. dissertation of the Univ. of Bonn, FRG is actually a monograph on all that is known on the Odon. of the tropical rainforest

of Liberia. It is based on 6 months field work (1982, 1983, 1986/87) and represents a treasure-mine of first-hand information on the ecology and reproductive behaviour of close to 100 spp., most of which were so far almost or entirely unknown from this point of view. Only a brief summary can be given here, and it is hoped that the work will soon be published in a more readily accessible form. — (1) 148 spp. are listed, of which 112 were not previously recorded from Liberia. About 9 of these are still undescribed, and a number of others were so far known from type specimens only. — (2) The evidence on the habitat requirements and reproductive behaviour can be summarised family-wise as follows: Protoneuridae inhabit streams, the highest number of spp. occurring on the upper reaches of forest streams. Male territoriality was recorded in some spp., a male of *Prodasineura villiersi* dwelled within the same territory for at least 50 days. The flight activity in this sp. amounts to 1.5% and it is generally low in the other members of the family as well. Oviposition takes place in tandem, on submersed vegetation (usually young roots), in *Elatoneura girardi* on floating leaves. Feeding flights are undertaken from a perch site, in *Chlorocnemis* also from a stationary hover flight. — Platynemididae are represented by 4 spp. (incl. 1 described but unnamed *Mesocnemis* sp.). All are rheophilous and oviposit or at least commence oviposition (*Mesocnemis singularis*) in tandem. Coenagrionidae occur on all types of water bodies, oviposition is usually in tandem, using various plant substrates. In *Agriocnemis macleachlani* the female is merely attended by the male. — Chlorocyphidae (*Chlorocypha*) occur on all running waters. Courtship display is described in some spp. Decaying wood is used for oviposition by most spp. The females of *C. dispar* and *C. sharpae* submerged in the process. — Only fragmentary field observations are available on the Gomphidae, of which family at least 5 spp. are still undescribed and a few others could not be identified. — Aeshnidae are represented a.o. by 4 *Gynacantha* spp., the peculiar "sit-and wait" male behaviour of *G. bullata* is recorded. — Corduliidae are represented by 3 genera, a few notes on oviposition are given for

some *Macromia* spp., of which one is still undescribed. — Libellulidae frequent all types of water bodies and have the highest number of spp. The reproductive behaviour of *Eleuthemis buettikoferi* and of 6 *Tetrathemis*-thinae spp. is described in detail. *E. buettikoferi* is characterised by a kind of temporary territoriality, confined to a spatially limited copulation site, by courtship display unusual for a libellulid and by aggregation of females at oviposition sites, resulting in aggregations of up to 1 million of eggs in one place. The *Tetrathemis* males occupy a territory on a stream or on a pond for up to 15 days, and exhibit the lowest activity values yet recorded in Anisoptera (*Tetrathemis bifida* 2.1%, *T. godiardi* 0.7%, *Eothenis zygoptera* 0.3%). *Tetrathemis* spp., *Malgassophlebia bispina* and *Notiothenis robertsi* have epiphytic oviposition, while *Allorhizucha* spp. (directly in water) and *E. zygoptera* (on the bank) are exophytic. — (3) In all, 4 stagnicolous habitats and 14 streams were studied systematically, and the composition of their odon. faunas is evidenced. The availability of perch sites and oviposition areas and their utilisation by the adults on the streams are analysed, and a longitudinal stream subdivision is proposed in terms of the odon. fauna. The relationship between the bank vegetation and the odon. fauna was examined. No significant differences could be detected in the odon. faunas of the primary forest streams (forest older than 100 yr) and those of the secondary forest (younger than 20 yr). On the other hand, the deforestation impact is considerable. In such areas, the rheophilic savannah spp. replace the autochthonous forest fauna. — (5) Some temporal partitioning was also evidenced. The maiden flight of Zygoptera and smaller Anisoptera mostly (86%) takes place during 10.00-13.00 hr. The diurnal activities of the forest stream spp. are described, and temporal male separation of 2 sympatric *Chlorocnemis* spp. is recorded. Last but not least, some seasonal fluctuations in the odon. fauna are brought on record. The sudden appearance of savannah spp. in the habitats created freshly by a drop in water table is interpreted in terms of a regular annual immigration of the savannah spp. — (6) The value of the work is

enhanced by the circumstance that all taxa were identified in collaboration with leading taxonomists; some were compared with type material, and descriptive notes are provided, where appropriate. — (*Abstracter's Note*: When the undescribed taxa will have been taken care of, and with very few additions and modifications, this book could be easily made into a reference work indispensable to students of African dragonfly behaviour. As it is, it represents a very significant contribution to our knowledge of the behaviour and ecology of numerous, hitherto entirely unstudied taxa).

- (6391) LENZ, N., 1988. *Ökologische Untersuchungen an Libellen (Insecta: Odonata) isolierter Kleingewässer in Schleswig-Holstein*. Diplomarbeit, Univ. Kiel, III+75 pp., 22 figs, 12 tabs incl. — (Author: Knooper Weg 150b, D-2300 Kiel-I, FRG).

The odon. fauna of 12 ponds in Schleswig-Holstein, northern FRG, was studied, abundance of 23 spp. and diversity (Shannon-Index) were measured. The influence of several abiotic and biotic factors on diversity and population density was examined by means of regression analyses. The ponds differed in size and degree of isolation (distance to next pond) but no influence of the size nor of the degree of isolation on the odon. fauna could be found out. A negative correlation was found between the nutrient load of the ponds and the diversity of their odon. fauna ( $r_s = -0.78$ ,  $P < 0.005$ ). Some possible reasons are discussed. The diversity of hydrophytes and helophytes which odon. require as oviposition site was positively correlated with the diversity of the fauna ( $r = 0.61$ ,  $P < 0.05$ ). A higher level of significance probably would have been found if it had been feasible to measure all types of oviposition sites with equal precision. The ratio of the abundance of *Coenagrion puella* and *C. pulchellum* and the abundance of *Lestes sponsa* and *L. dryas* was highly significantly positively correlated with the ratio of the ponds' supply of their horizontal resp. vertical oviposition sites ( $r = 0.79$ ,  $P < 0.005$ ). Both horizontal oviposition sites (e.g. floating leaves) and vertical oviposition sites (e.g. reeds) are provided by several plant

spp. This indicates that not a specific plant sp. but the physiognomy or tissular structure of the plants is important for the habitat selection of Odon. — (Author).

- (6392) *LINDENIA*. Notiziario dell'Ufficio Nazionale Italiano della Società Odonatologica Internazionale, Roma. No. 10 (July 1, 1988). — (c/o Prof. Dr C. Utzeri, Dipt. Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).

A small issue, containing an exhaustive account of the IXth Int. symp. Odonatol., Madurai (by C. Utzeri), the traditional bibliographic sections, and brief reviews of 5 recently published odonatol. books.

- (6393) MAHATO, M., 1988. Dragonfly inventory of the surveys in eastern and mid-western Nepal, with records of five species new to the fauna of Nepal (Odonata). *Opusc. zool. flumin.* 29: 1-9. — (Nat. Hist. Mus., Manjushree Bazar, Swayambhu, Kathmandu, Nepal; — *present temporary address*: Dept Biol., East Tennessee St. Univ., Box 23590 A, Johnson City, TN 37614-0002, USA).

A list is presented of 43 spp. collected at 5 localities in the Ilam and Pachthar districts in eastern Nepal, and at 10 sites in the Dang, Banke, Surkhet and Dailekh districts in mid-western Nepal, alt. 130-2438 m. The hitherto unrecorded museum material from the Pokhara region and the Dharan area is also included. *Agriocnemis lacteola* Sel., *Himalagrion exclamationis* Fraser, *Chlorogomphus mortoni* Fraser, *Macromia cingulata* Ramb., and *Cratilla lineata* (Br.) are new to the fauna of Nepal, and their records are briefly discussed.

- (6394) MALKMUS, R., 1988. Wanderungen im Mount Kinabalu-Nationalpark/Nordborneo. *Natur & Mus., Frankfurt/Main* 118(6): 161-181. — (Schulstr. 4, D-8771 Wiesthal, FRG). An outline of geology, ecology, flora, fauna, and of the "management problems" of the Mt Kinabalu Nat. Park, N. Borneo, Malaysia, with a brief reference to 5 endemic odon. spp.

- (6395) *MARTINIA*. Bulletin de liaison des Odonato-

logues de France, No. 8 (June, 1988). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois d'Arcy).

*Tiberghien, G.*: Une tératologie alaire multiple chez *Platetrum depressum* (Linnaeus, 1758) (Odonata, Anisoptera; Libellulidae) (pp. 33-34); — *Papazian, M.*: Contribution à l'inventaire des odonates du département du Loiret (35-38); — *Da Silva Aguiar, S.*: Représentation extravagante d'une libellule? (39-40); — *Carrière, J.*: Aspect comportemental insolite d'*Onychogomphus uncatus* (Charpentier, 1840) dans l'Hérault (Odonata, Anisoptera: Gomphidae) (41-43); — *Boursier, J.-L.*: Conservation des couleurs des odonates (44); — *Rochat, C.*: Note sur les odonates du Loiret (45-46); — *Dommanget, J.-L.*: Additif bibliographique à l'Etude faunistique et bibliographique des odonates de France, I (47-51); — Rubrique bibliographique (51-54); — *Heidemann, H. & J.L. Dommanget*: Analyses d'ouvrages (55-56).

- (6396) MATSUKI, K., 1988. Description of the larva of *Zygonyx iris insignis* (Kirby) from Hongkong (Libellulidae, Odonata). *Gekkan Mushi* 210: 24-25. (Jap., with Engl. title & fig. captions). — (Fujisaki 2-6-2-305, Narashino-sho, Chiba, 275, JA).

Exuviae from the Tai-po-kau Forest and from Ho Chung, both in Hongkong, are described and figured. The larva is compared with that of *Z. i. malayana*.

- (6397) MICHIELS, N., 1988. Observations of dragonflies (Odonata) on Corsica. *Bull. Anns Soc. r. belge Ent.* 124: 115-123 — (Dept Biol., Univ. Antwerpen, Universiteitsplein 1, B-2610 Wilrijk).

The survey has been conducted in June, 1986. The records of the 3 spp. recently listed as new by M. Papazian (1987, *Martinia* 5: 13-17) are confirmed, and fresh material was gathered of 13 spp. that were so far known from Corsica from a single specimen, or had not been recorded for half a century or longer. The total number of Odon. known from the island is now 39 spp.

- (6398) MIURA, T. & R.M. TAKAHASHI, 1988. A

laboratory study of predation by damselfly nymphs, *Enallagma civile*, upon mosquito larvae, *Culex tarsalis*. *J. am. Mosquito Control Assoc.* 4(2): 129-131. — (Univ. California Mosquito Control Res. Lab., 9240 South Riverbend Ave., Parlier, CA 93648, USA).

Average daily consumption of 3rd instar *C. tarsalis* by the ultimate instar *E. civile* was 6.06 larvae (range 4.64-8.67). Experiments in which density of prey (mosquito larvae) and predators (odon. larvae) were varied, showed that more prey was consumed as prey density increased. However, fewer prey were consumed at higher predator densities; mutual interferences among predators at higher predator densities are suspected.

- (6399) NOVELO-GUTIERREZ, R., O. CANUL-GONZALEZ & J. CAMAL-MEX, 1988. Los odonatos del estado de Quintana Roo, México (Insecta: Odonata). *Fol. ent. mex.* 74: 13-68. (With Engl. s.). — (Insectario-DPAA, DCBS, Univ. Autónoma Metropolitana-Xochimilco, Apdo Postal 23-181, MX-04960 México, D.F.).

This is a beautiful monograph on the odon. fauna (74 spp.) of the state of Quintana Roo, Mexico, with special reference to Sian Ka'an nature reserve. A number of spp. are new to the Yucatán Peninsula, while *Ischnura posita*, *Aphylla caraiba* and *A. williamsoni* had not been previously recorded from Mexico. The spp. are keyed, descriptive notes are provided, and the biogeographic composition of the fauna is analysed.

- (6400) ODONATA RECORDING SCHEME NEWSLETTER, No. 10 (May, 1988). — (c/o R. Merritt, 38 New Rd, Holymoorside, Chesterfield, Derbysh, S42, 7EN, UK).

The areas of the 6 British regions are shown along with the addresses of the regional recorders. An outline is presented of the new "Key sites" project, and the new recording card is introduced. Of particular interest are records of 9 selected spp. The new Atlas is scheduled to appear in early 1989. It is to be compiled by R. Merritt, the National Organizer of the Odon. Recording Scheme.

- (6401) PETERS, G., 1988. Libellen (Odonata) von den Kanarischen Inseln. *Ent. Nachr. Ber.* 32(1): 39-40. (With Engl. & Russ. s's). — (Mus. Naturk., Humboldt-Univ., Invalidenstr. 43, DDR-1040 Berlin, GDR).  
The inventory of a small Canary Isls collection is brought on record, and some biogeographical and ecological peculiarities of the Makaronesian odon. fauna are discussed. The scarcity of the *Zygopt.* spp. is explained by their inability to reach the islands actively, and it is emphasized that, with the exception of *Sympetrum nigrifemur*, no signs of insular evolution have been reported.
- (6402) PETERS, H.P.J., 1988. *Exuviae als graadmeter voor succesvolle voortplanting in de Overasseltse- en Hatertse vennen.* — [*Exuviae as the evidence of a successful breeding in the Overasseltse and Hatertse fens*]. Staatsbosbeheer, Nijmegen. 63 pp. (A4, soft cover). (Dutch). — (Gorisstraat 22, NL-6521 CK Nijmegen).  
This is the continuation of the work listed in OA 5633. The recording of exuviae is (very correctly) considered as the sole firm evidence of the autochthony of the taxa involved. For some spp. direct dependence on the water quality (pH) could be demonstrated. Phenology and numerous incidental field observations (interspecific tandems, predation) are also recorded.
- (6403) PISANENKO, A.D., 1988. К фауне стрекоз Минской области. — On the fauna of the dragonflies of the Minsk district. *Larv. Ent.* 31: 25-27. (Russ., with Engl. s.). — (Zool. Mus., Byelorussian St. Univ., Minsk, USSR).  
List of 40 spp., collected during 1977-1979. *Ischnura elegans* has not been previously reported from Byelorussia, USSR.
- (6404) RETTIG, K., 1988. Nunmehr 40 Libellen-Arten in Ostfriesland nachgewiesen. *Beitr. Vogel- Insektenwelt Ostfriesland* 30: 14-17. — (Danziger Str. 11, D-2970 Emden, FRG).  
With reference to the work listed in OA 5757 and to the note by C. Lempert (cf. OA 6133), *Aeshna subarctica* [elizabethae] is added to the list of Odon. so far recorded from the ostfriesland prov. FRG.
- (6405) RÜPPELL, G., 1988. *Tramea lacerata* (Libellulidae): Eiablageverhalten. *Publ. wiss. Filmen* (Biol.) 20(3): 1-7. (With Engl. & Fr. s's). — (Zool. Inst., Techn. Univ. Braunschweig, Pockelsstr. 10a, D-3300 Braunschweig, FRG).  
Explanatory text for film No. E-2996 (Inst. Wiss. Film. Göttingen; colour, no voice, 16 mm, 7 min). Tandem, separation, male guarding, etc. are shown. The upward female flight and the unguarded oviposition are also recorded.
- (6406) RYAZANOVA G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1988. Svyaz' oboronitel'nogo povedeniya lichinok strekozy *Calopteryx splendens* (Harris) (Zygoptera) s ih vozrastom i polom. — The dependence of the defence behaviour of larvae of a dragon-fly *Calopteryx splendens* (Harris) (Zygoptera) on their age and sex. *Byull.moskov. Obshch. Ispytat. Prir.* (Biol.) 93(3): 40-49. (Russ., with Engl. s.). — (Dept Ent., Fac. Biol., Lomonosov St. Univ., Moscow V-234, USSR).  
The age and sex specific characteristics of the position of the larvae on a substrate in a stress situation, and the mode and speed of their response to an approaching dangerous object are described. Obviously, the age and sex specific features of the groups of larvae determine the effect of death of older males in confrontations with conspecifics during the long periods of starvation. In younger individuals these features provide a passive defence against predators, contributing in this way to the vertical stratification of the population.
- (6407) SCHMIDT, E., 1988. Ökosystem Buchenwaldtümpel — ein Extrembiotop. Unterrichtsanregung für die Sekundarstufe II. *Unterricht Biol.* 12(133): 46-50. — (Biol. Didaktik. PF, Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG).  
The paper, directed at high-school Biology teachers, describes the environment and the biotic communities in beech forest ponds in the Kottenforst, Bonn, FRG. In a table a comparison is presented of the environmental conditions and fauna prevailing in a shady and in a

sun-lit pond. No odon. occur in the former.

- (6408) SCHMIDT, E., 1988. Ist die Westliche Keiljungfer *Gomphus pulchellus* Selys, 1840, eine Stillwasserart? (Odonata-Gomphidae). *Tier & Mus.* 1(1): 17-20. (With Engl. s.). — (Biol. Didaktik, PF, Univ. Bonn., Römerstr. 164, D-5300 Bonn-1, FRG).

*G. pulchellus* is often recorded from standing water habitats. It is indicated here that the sp. has a preference for sites with some water movement. The problem of habitat choice is discussed and more evidence on the subject is needed.

- (6409) SIOJA. [Information Bulletin of the SIO National Office in Japan], Osaka, 1988, No. 1 (July 25). (Jap.). — (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA). The most important item of this small issue is a brief obituary for Dr Shigeru Obana (by K. Inoue) who, after a prolonged illness, but still very unexpectedly, passed away in the afternoon of July 12, 1988. [For his biography and bibliography cf. *Odonatologica* 14(1985): 81-88]. He was one of the most distinguished odonatologists in Japan, and highly respected, indeed, loved, by the odonatol. community throughout the world. On behalf of the SIO Council, a Buddhist floral offering, "Shikimi Leaves" was presented by the Head of the SIO National Office in Japan.

- (6410) SPURIS, Z.D., 1988. Vidovoy sostav fauny SSSR. — The species composition of the dragonflies fauna of the USSR. *Larv. Ent.* 31: 5-24. (Russ., with Engl. s.). — (Hortus botanicus, Latvian Acad. Sci., Miera iela 19-6, USSR-229021 Salaspils, Latvia).

A checklist is presented of the 160 spp. known from the USSR territory, the doubtful taxa are omitted, and their occurrence in the European USSR, Caucasus, Siberia, Far East and in the USSR Central Asia is indicated. Intraspecific taxa are also mentioned and briefly commented upon, where needed. — (*Abstracter's Note*: It is amazing that the total fauna of the USSR has only twice the number of spp. occurring in e.g. Switzerland (more than 400 times smaller!), and it is considerably smaller

than that of e.g. Japan, 186 spp.).

- (6411) SPURIS, Z.D., 1988. [Recenzijas]. D.A.L. Davies & P. Tobin, The dragonflies of the world, Vols. 1 & 2. *Latv. Ent.* 31: 91-92. (Russ.). — (Hortus botanicus, Latvian Acad. Sci., Miera iela 19-6, USSR-229021 Salaspils, Latvia).

Comprehensive review and evaluation on the work listed in OA 5014 and 5042. — (*Abstracter's Note*: The reviewer understood the authorship of this work was shared by three authors, "D. Allen, L. Davies and P. Tobin". The Editor of the SIO series is partly responsible for this. Although it is the general policy in all SIO publications to list the initials of the authors' given names only, the given name is printed in full upon the author's explicit insistence. The present error is only one among the virtually countless examples of confusion caused in bibliographic and abstracting works by full spelling of the given names of the authors).

- (6412) SPURIS, Z.D., 1988. [Recenzijas]. S. Tsuda, A distributional list of world Odonata. *Latv. Ent.* 31: 92-93. (Russ.). — (Hortus botanicus, Latvian Acad. Sci., Miera iela 19-6, USSR-229021 Salaspils, Latvia).

Comprehensive review of the volume listed in OA 5447. The coverage is compared with that of the Davies & Tobin catalogue.

- (6413) SPURIS, Z.D., 1988. [Recenzijas]. Advances in Odonatology, Vol. 3. *Larv. Ent.* 31: 93-94. (Russ.). — (Hortus botanicus, Latvian Acad. Sci., Miera iela 19-6, USSR-229021 Salaspils, Latvia).

Comprehensive review of the volume listed in OA 5908. The contents of most of the papers are stated and briefly discussed.

- (6414) STANIONYTE, A.P., 1988. Strekozy (Odonata) na ohranyaemyh territoriah Litvy. — Dragon-flies (Odonata) on the protected territories of the Lithuanian SSR. *Acta ent. lituan.* 9: 20-26. (Russ., with Engl. & Lithuan. s's) — (Inst. Zool. & Parasitol., Mokslu Acad., MTP-1, Lenino pr. 3, USSR-23600 Vilnius, Lithuanian SSR).

In the largest 9 nature reserves of Lithuania 45 odon. spp. were evidenced, representing 81% of the spp. known from the territory of the state, and incl. 5 spp. that were never recorded outside the protected areas. The fauna of each of the reserves is listed and briefly discussed.

- (6415) STARK, W., 1988. Libellenbeobachtungen im Leithagebirge (Hexapoda, Odonata). *Burgenländ. Heimatbl.* 50(2): 74-89. (With Engl. s.). — (Goethestr. 28, A-8010 Graz). 1794 specimens, pertaining to 25 spp. were recorded in the Leitha Hills, Burgenland, Austria. 27.6% of the individuals were in teneral condition. There are no odon. breeding habitats in the hills; all individuals are assumed migrants from the Neusiedler Lake area.
- (6416) THOMPSON, D. & R. DUNBAR, 1988. Sex for dragons and damsels. *New Scientist* 1601: 45-48. — (First Author: Dept Zool., Univ. Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK).  
Excellent concise review of odon. sex biology and reproductive behaviour, with references to sexual and natural selection.
- (6417) UTZERI, C. & G. SORCE, 1988. Sostituzione dello sperma in *Coenagrion scitulum* (Rambur) (Odonata: Coenagrionidae). *Atti XV Congr. naz. ital. Ent., L'Aquila*, pp. 723-729. (With Engl. s.). — (Dipt. Biol. anim., Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).  
Among the Zygoptera, *C. scitulum* shows a unique pattern of copulation behaviour, in which 2 stages are recognized. During stage I, copulation is interrupted and resumed up to 7 times; in stage II, the intra-male sperm translocation is repeated 2-4 times. Experiments were conducted relative to sperm displacement during stage I. No indication was obtained as to the meaning of repeated intra-male intra-copula sperm translocation, but 5 tentative suggestions are advanced in an attempt to explain the significance of phenomenon.
- (6418) UTZERI, C. & G. SORCE, 1988. La guarde pre- e post-copula negli zigotteri: due casi specializzati. *Atti XV Congr. naz. ital. Ent., L'Aquila*, pp. 731-737. (With Engl. s.). — (Dipt. Biol. anim., Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).  
Postcopulatory guarding in *Lestes barbarus* and *L. virens*, and precopulatory guarding in *Coenagrion scitulum* are analyzed. In all 3 spp. the males outnumber the females at the reproductive sites. All of them exhibit variable guarding times. This behaviour may function to postpone the release of the female at a time of the day when the unpaired males at the pond are decreasing in number, whereby the risk for the freshly mated male of losing sperm precedence is diminished.
- (6419) VAN DOESBURG, P.H., 1988. In memoriam dr. D.C. Geijskes (1907-1985), een biografie en een bibliografie. *Ent. Ber., Amst.* 48(9): 133-139, portrait incl. (Dutch). — (Rijksmus. Nat. Hist., P.O. Box 9517, NL-2300 RA Leiden).  
Biography and a fairly complete bibliography of this distinguished Dutch worker. (Cf. also *Odonatologica* 1(1972): 181-189).
- (6420) *WALKERIA*. Newsletter of the Canadian National Office of the International Odonatological Society, Vancouver, Vol. 3, No. 1 (June 1, 1988). — (c/o Dr S. Cannings, Dept Zool., Univ. British Columbia, 6270 University Blvd, Vancouver, B.C., V6T 2A9, CA).  
*Lyons, R.*: A note on *Libellula quadrimaculata* form *praenubila* (pp. 1-2); — *Pritchard, G.*: Memories of Madurai (2-3); — Notes from the SIO Council Meetings, Madurai, 1988 (3-4). — The standard sections, "Canadian Odonatology" and "Requests", contain 5 notes.
- (6421) WASSCHER, M.T., 1988. *Libellen als mogelijke indicatoren voor waterkwaliteit en ruimtelijke variatie op laaglandbeken in Zuid Oost Brabant*. — *On the use of Odonata as monitors for water quality and spatial heterogeneity on lowland brooks in "Zuid Oost Brabant"*. M. Sc. thesis, Dept Plant Ecol., Univ. Utrecht. 38 pp. (Dutch, with Engl. s.). — (Minstraat 15 bis, NL-3582 CA Utrecht).  
With reference to the environmental parameters relative to odon. occurrence, 165 km of streams were surveyed in the Dommel drainage system, the Netherlands. The classifi-

cation and nomenclature of the aquatic communities adopted are those defined by K. H. M. Moller Pillot (cf. *OA* 85). In the area studied, *Platycnemis pennipes* is considered the indicator of the highest water quality, and 6 other spp. also have an indicative value for different habitats.

- (6422) WISSINGER, S.A., 1988. Effects of food availability on larval development and inter-instar predation among larvae of *Libellula lydia* and *Libellula luctuosa* (Odonata: Anisoptera). *Can. J. Zool.* 66(2): 543-549. (With Fr. s.). — (Dept Biol. Sci., Purdue Univ., West Lafayette, IN 47907, USA).

2 types of laboratory experiments were conducted. In one experiment the number of daily fed *Daphnia magna* was varied to determine the effect of food availability on growth and survivorship. The time spent in each instar decreased dramatically with increased food availability, but the number of molts did not vary and the size at each molt was only slightly affected. Mortality was low in all but the lowest feeding treatment, despite 2- to 5-fold differences in instar duration. These results suggest that the number and size of instar are determinate in these spp., and that starvation is an unlikely cause of larval mortality in nature. In a second experiment the naturally co-occurring size combinations of these spp. were used to determine how inter-odon. predation varies as a function of larval size difference. For both intra- and inter-specific combinations, little or no predation occurred between larvae similar in size. Some predation always occurred when larvae differed by more than two instars, and the number of larvae consumed increased dramatically as a function of instar difference. The proportional difference between the labial (gape) width of the larger instar and the head width of the smaller instar was a good estimator of inter-odon. predation rates across all instar and spp. combinations. Together these results suggest that the effects of inter-odon. competition and predation can be disentangled in the field by manipulating the instar structure of experimental populations.

- (6423) WOLF, L.L. & E.C. WALTZ, 1988. Oviposition site selection and spatial predictability of female white-faced dragonflies (*Leucorrhinia intacta*) (Odonata: Libellulidae). *Ethology* 78: 306-320. — (Dept Biol., Lyman Hall, Syracuse Univ., Syracuse, N.Y. 13244, USA).

Oviposition sites used by a population of *L. intacta* were studied at a small pond near Syracuse, NY, USA. Females preferentially used shallow water as an oviposition habitat. Shallow water increases egg hatching rate through temperature effects on development time and reduces predation on the female. Use of shallow water areas was reduced by locally high densities of territorial males. The same oviposition sites probably maximized the fitness of the male, female, and offspring, meaning that site selection did not necessitate fitness tradeoffs among these classes of individuals. Pond sectors used by ovipositing females were significantly correlated within and between years, but not within days or between consecutive days. Use of pond sectors within and between days was not related to the relative availability of the shallow water habitat, while seasonal use of pond sectors was related positively to availability of shallow water. In spite of the preference by females for ovipositing in shallow water, short-term location of females was not predictable and males could not search predictably good areas during a day. However, across a season, areas with more shallow water available were used for oviposition more than areas with limited substrate.

- (6424) ZETTELMEYER, W., 1988. Faunistisch-ökologische Bestandsaufnahme des NSG Schwarzes Bruch (Kr. Paderborn/Westfalen). *Natur & Heimat, Münster* 48(2): 33-44. — (Hauptstr. 59, D-4952 Porta Westfalica/Hausberge, FRG).

The odon. fauna of this Nature Reserve nr Lichtenau (alt. 342 m), Westfalia, FRG consists of 16 spp. The phenology of these is evidenced and discussed in some detail (pp. 38-41).