ODONATOLOGICAL ABSTRACTS

1971

(6425) PAVLOVEC, R., 1971. Exlibrisi med planinci. — [Some book plates of the mountaineers]. *Plan. Vest.* 71(6): 280-283. (Slovene). — (Trubarjeva 14, YU-61000 Ljubljana, Slovenia).
Reproductions and technical descriptions are given of some alpine-motif book plates (ex libris) of some alpinists and/or mountaineers. Among these is an ex libris of Prof. B. Kiauta, as published also in *Selysia* 17(2): 11 (1988), in which his 3 principal professional interests are symbolically depicted in a composition showing the North Face and glacier of Mt Triglav in the Eastern Alps, the "Brilliant" stalagmite in the Cave of Postojna (Adelsberg-/Postumia), and an adult Sympetrum vulgatum, standing for resp. high mountain research, biospeleology and odonatology. The book plate was made by D. Smit (1966, Utrecht) and has been exhibited at Ex Libris exhibits in Slovenia (Yugoslavia) (1975) and Holland (1978).

1973

(6426) BURMANN, K., 1973. Wandernde Kleinschmetterlinge (Microlepidoptera). *Atalanta* 4(6):: 353-360. — Anichstr. 34, A-6020 Innsbruck).
Dead Odon. are reported from a glacier in the Stubaier Alps (Austria), alt. above 3000 m, 9-IX-1951. No specific names are stated. — (For a review of "glacier records" of Odon., cf. *OA* 3885).

1976

(6427) MEINEKE, T., 1976. Beobachtungen von Insektenwanderungen auf der Insel Sylt in der Zeit vom 30.VII.-9.VIII.1975. *Atalanta* 7(4): 216-218. — (Am Eichelbach, D-3420 Herzberg, FRG).
Migrating Odon. were recorded at 2 localities on the Northsea island of Sylt, 8-VIII-1975. No species names are stated.

(6428) MERIAN, M.S., 1976. *Schmetterlinge, Käfer und andere Insekten. Leningrader Studienbuch.* Acta humaniora, VCH Verlagsgesellschaft, Weinheim (FRG) [ISBN 3-527--17539-3] & VCH Publishers Deerfield Beach (FL, USA) [ISBN 0-89573-446-X]. Vol. 1 (text): 472 pp. (incl. facsimile handwritten notes, with transliteration), Vol. 2 (120 col. pls). Bibliophile edition, issued in 1750 (arabic-) numbered copies + 50 (roman-) numbered copies for library deposition. Vol. 1 hardbound, Vol. 2 unbound pls in box, the 2 vols together in a dustjacket. 24x32 cm. Text in Germ., Engl., Fr. & Russ. — Price: DM 1062.- net.
The manuscript, with watercolours and notes of Maria Sibylla Merian (1647-1717), reproduced in this volume, is in possession of the Library of the Academy of Sciences of the USSR (signature F no. 246), Leningrad. It includes 2 odon. spp. Fig. 219 (adult ♂, adult ♀, larva) is identified as "Agrion sp.", representing a European Coenagrion. Fig. 162 a shows a Gomphus vulgatissimus and its exuviae. In the respective captions, field observations on the ecdysis of both spp. are emphasised.

1981

(6429) TAMM, J.C., 1981. *Das jahresperiodisch trockenliegende Eulitoral der Edertalsperre als Lebens- und Ersatzlebensraum. Eine ökosystemstudie mit terrestrischem Schwerpunkt.* Inaug.-Diss. Philipps-Univ. Marburg, Marburg/Lahn. IV+161 pp. — (Author's address not known).
The eulittoral biotic communities of the Edertal man-made lake, North Hessen, Germany, are described, analysed, and discussed with reference to the "substitute value" of fluctuating man-made lakes for the fauna of natural, now largely destroyed riverine backwater habitats. Enallagma cyathigerum, Calopteryx splendens, Aeshna cyanea and Sympetrum flaveolum are the only odon. spp. recorded in the summer reed areas of the lake.

1983

(6430) KOBAYASHI, T., 1983. [Somatochlora arctica from Mt Irikasa, Nagano Pref.]. *Gekkan Mushi* 143: 38 (Jap.). — (Lion Co., Ninomiya-ryo, 457, Yamanishi, Ninomiya-machi, Naga-gun, Kazagawa Pref., 259-01, JA).
A female is recorded from the Hase-mura marsh, Kami-ina-gun, Nagano, alt. 1800-1900 m (10-VIII-1981).

1984

(6431) FRY, C.H., 1984. *The Bee-eaters.* 304 pp. Poyser, Colton. ISBN 0-85661-037-2.
After H. Dresser's (1884-1886) classical *A monograph of the Meropidae*, this is the first monographic treatment of the family. Odonatologically are of particular importance the Appendices, giving the diets of various spp. Thus, the odon. are represented in the diets of the following spp.: Meropogon pusillus (Nigeria, Zambia, Malawi, Zimbabwe, Botswana: 8% of prey items), M. bullocki (Nigeria; 1%), M. albicollis (Nigeria; 0.05%), M. apiaster (Europe; 65.5%). In most cases detailed lists of prey are presented, and the odon. are often identified to the sp. level.

(6432) KUCHEROV, E.V., [Ed.], 1984. *Krasnaya kniga Bashkirskoy ASSR.* – [*Red data book of the Bashkir ASSR*]. Bashkirskoe Knizhnoe izdatel'stvo, Ufa. 200 pp. (Russian).
This is the official Red Data Book of the Bashkir Autonomous Republic, European USSR. Libellula depressa is the only odon. sp. treated (p. 138, fig 46a). It is called *"enegarak"* in the Bashkir language (southern Ural area), and is considered a beneficial predator, therefore the protection of its habitats is advocated. — (For the USSR Red Data Book cf. *OA* 5090).

1985

(6433) KUMAR, A., 1985. Studies on the life history of Indian dragonflies, Ictinogomphus rapax (Rambur) (Gomphidae: Odonata). *Ann. Ent.* 3(1): 29-38. — (Northern Regional Stn, Zool. Surv. India, 13 Subhas Rd, Dehra Dun-248001, India).
I. rapax has been reared from egg to adult. The principal changes in external morphology during the development of larval instars are described, and the characters helpful in distinguishing various instars are stated and figured. Notes on oviposition and on egg morphology are also provided.

(6434) PEKKARINEN, A., 1985. Aimo K. Merisuo (1907-1984). *Notul. entomol.* 65: 101-102. (Finnish).
Obituary, with a portrait and bibliography (1932-1980). A.K.M. was a hymenopterologist and an excellent artist and photographer. As a student of the great Finnish odonatologist, K.J. Valle, Merisuo made for him a beautiful dragonfly book plate (ex libris), based on the photograph of ovipositing Aeshna grandis published originally in W.J. Lucas' *British dragonflies* (1900), and republished in Valle's *Suomen sudenkorennoiset* (1922) and in C. Wesenberg-Lund's *Biologie der Süsswasserinsekten* (1943). — On Merisuo's 70th birthday, a biographic article was published in *Notul. entomol.* 57(1977): 128-129.

1986

(6435) CHOWDHURY, S.H. & A. BARMAN, 1986. Food habits of a libellulid dragonfly Pantala flavescens (Fabricius). *Ann. Ent.* 4(2): 1-6. — (Dept Zool., Univ. Chittagong, Chittagong, Bangladesh).
Stomach contents of freshly captured adult dragonflies were analysed. The results show that they feed on a large variety of insects; the Rice Stem Borer moths, leaf hoppers and male mosquitoes make up a significant portion of the diet.

(6436) CORBET, P.S., [Ed.], 1986. Current topics in dragonfly biology, Vol. 2. *Soc. int. odonatol. rapid. Comm.* (Suppl.) 6: VIII+32 pp. — (Old Manse, 45 Lanark Rd, Edinburgh, EH14 1TL, Scotland, UK). — The booklet is available from the S.I.O. Central Office, P.O. Box 256, NL-3720 AG Bilthoven. — Price: Hfl.20.- net; — Vols 1-3, with Standing Order: Hfl. 50.-.
This is the transcript of a tape-recorded discussion conducted during the "Corbet Seminar", in the framework of the VIIIth Int. Symp. Odonatol., Paris, August 1985. The subjects dealt with are: "Breeding in small containers", "Economic importance", "Aestivation of adults in temperate latitudes", "Dimorphism in adults", "Life history patterns in the tropics: wet and dry season adaptations", and the "Seasonal regulation at different latitudes". The contributors are: *L.W. Beukeboom, E. Caron, R.A. Cannings, D.A.L. Davies, O. Fincke, R.M. Gambles, D.C. Geijskes, B. Kiauta, J. Legrand, A.B.M. Machado, M.L. May, N.W. Moore, J. Ott, M.J. Parr, J.-G. Pilon, F. Schaller, B. Sigwalt, M.T. Siva-Jothy, B.K. Tyagi, C. Utzeri, J.K. Waage* and *M.J. Westfall.* The discussion was moderated by Prof. *P.S. Corbet.* — (For Vols 1 and 3, cf. *OA* 4563 and 6472 resp.).

(6437) CORBET, P.S., 1986. Using dragonflies to suppress mosquitoes in domestic water-storage containers. *Waterlines* 4(3): 10-11. — (The Old Manse, 45 Lanark Rd, Edinburgh, EH14 1TL, Scotland, UK).
A brief account for general readership of a conspicuously successful field trial in which anisopterous larvae were used in a biological-control programme to suppress larvae of the Yellow Fever Mosquito, Aedes aegypti, in a suburb of Rangoon, Burma. The trial was devised and supervised by Anthony Sebastian and entailed active and enthusiastic participation by the local community. The success of this venture is cited as an encouragement to other medical entomologists to exploit opportunities of this kind. — (Cf. also *OA* 3195).

(6438) GERECKE, R., 1986. Le acque interne di Sicilia e la loro fauna: un patrimonio naturale da salvare. *Animalia* 13(1/3): 217-245. (With Engl. & Germ. s's). — (Biesinger Str. 11, D-7400 Tübingen, FRG).
The typology of the Sicilian (Italy) running waters is analysed with reference to their animal communities. A few references to Odon. are included.

(6439) KAZI, S.M., 1986. Experimental infection of nymph Coenagrion puella with H. variegatus and H. similis in the laboratory. *Riv. Parassitol.* 3(3): 349-352. — (Parasitol. Sect., Zool. Dept, Sind Univ., Jamshoro, Sind, Pakistan).
The work was carried out at the Imperial Coll., London. — The second intermediate host, C. puella, was exposed to cercariae of Haematolaechus similis and H. variegatus, and 1-2 unencysted metacercariae were found free in the haemocoele on the following day. Out of 10 larvae un-exposed to the trematode (and used as controls), 1 was positive. Hence, an experimental infection was not unequivocally demonstrated.

(6440) STILING, P.D., 1986. *Butterflies and other insects of the Eastern Caribbean.* MacMillan Caribbean, London-Basingstoke. VIII+86 pp. — ISBN 0-333-38962-X. — Price: US $ 15.
Contains a brief chapter on the Odon., with col. photographs of Argia sp., Orthemis ferruginea and Brechmorhoga praecox.

(6441) WEBB, W.J., E.D. CASHATT & H.D. BOHLEN, 1986. Four new dragonfly records in Illinois: Cordulegaster diastatops (Selys),

Erythrodiplax connata minuscula (Rambur), Celithemis verna Pritchard, Celithemis monomelaena Williamson (Odonata: Cordulegastridae, Libellulidae). *Trans. Ill. Acad. Sci.* 79(3/4): 189-191. — (Zool. Sect., Illinois St. Mus., Springfield, Ill. 62706, USA).
The 4 spp. were discovered in the entomology collection at the Illinois State Natural History Survey, Champaign, Illinois, and represent new state records. The label data, measurements and brief comments are stated.

1987

(6442) BERRILL, M., L. ROWE, L. HOLLETT & J. HUDSON, 1987. Response of some aquatic benthic arthropods to low pH. *Annls Soc. roy. zool. Belg.* 117 (Suppl. 1): 117-128. [= H. Witters & O. Vanderborght, (Eds), *Ecophysiology of acid stress in aquatic organisms*]. — (First Author: Watershed Ecocystems Program, Trent Univ., Peterborough, Ont., K9J 7B8, CA).
Field-collected eggs and larvae of Ischnura verticalis and Libellula lydia were exposed to pH 3.5 (or 4.0) and 6.5. Neither showed any sign of stress in the experiments. Larvae of neither sp. suffered any mortality while exposed to pH 3.5 in soft water for 192 hr. Concentrations of Na and Cl in larvae appear to have been unaffected by 96 hr exposure to pH 3.5. Eggs of both spp., which do not have to undergo diapause, hatched with remarkable success even at pH 3.5 relative to pH6.5, and their hatching was not delayed. The experiments support the field observation that Odon. are tolerant of low pH.

(6443) DUNKLE, S.W., 1987. Rare and threatened dragonflies (Anisoptera) in Florida. *Atala* 15(1/2): 17. — (Bureau Ent., Div. Plant Industries, P.O. Box 1269, Gainesville, FL 32602, USA).
A one sentence abstract of a talk, where the taxonomic status, ecology and distribution of the rarer spp. of Florida Anisoptera were discussed.

(6444) FUJIYAMA, I., 1987. Middle Miocene fauna of Abura, Hokkaido, Japan, with notes on the occurrence of Cenozoic fossil insects in the Oshima Peninsula, Hokkaido. *Mem. natn.Sci. Mus., Tokyo* 20: 37-44. (Jap., with Engl. s.). — (Dept Paleontol., Natn. Sci. Mus., Tokyo, JA).
The Middle Miocene insect fauna described is associated with the Miocene Daijima-type flora of warmer climate. Of 19 spp. recorded, 12 are referable to Heteroptera, 6 are Coleoptera, and 1 is a dragonfly, given as "Gomphinidae" gen. & sp. indet. The composition of the fauna is discussed and the absence of any distinct tropical genera is emphasised.

(6445) HURYN, A.D. & J.B. WALLACE, 1987. The exopterygote insect community of a mountain stream in North Carolina, USA: life histories, production, and functional structure. *Aquat. Insects* 9(4): 229-251. — (Dept Ent., Univ. Georgia, Athens, GA 30602, USA).
Life histories and production of the Exopterygota inhabiting the upper Ball Creek, a first-to second-order mountain stream in the southern Appalachians, were studied by replicated monthly sampling of 3 different habitats (BO = boulder-outcrop, R = riffle, PL = pool). Life histories were diverse, ranging from multi-voltine (e.g. Baetis) to semi-voltine (e.g. Leuctra ferruginea, Sweltsa lateralis). — Habitat-weighted annual production was 1862 mg (ash-free day weight)/m² with > 50% being based on four taxa (of 21 considered): Serratella sp. (16%), Peltoperlidae (16%), Leuctra spp. (13%), and Beloneuria spp. (8%). The Odonata, Ephemeroptera, and Plecoptera contributed 36, 760, and 1066 mg/m² to annual production, respectively. Production was distributed evenly among four functional groups with collector-gathers, shredders, scrapers, and engulfing-predators contributing 21%, 33%, 23%, and 23%, respectively. Production by functional groups followed broad taxonomic categories with the Ephemeroptera, euhologнathous Plecoptera, and systellognathous Plecoptera contributing 93%, 90%, and 92% of the scraper, shredder, and engulfing-predator production, respectively. Serratella sp. contributed 77% of the collector-gatherer production. — Annual production by the Exopterygota was greatest in the BO habitat (2056 mg) > R (1981 mg) > PL (951

mg). Production in the BO was attributable to a unique combination of taxa compared with R and PL. Sixty-five percent of the BO production was based on Serratella sp., a collector-gatherer. Collector-gatherers constituted only 2% and 8% of PL and R production, respectively. The remainder of the PL and R production was generally distributed evenly among scrapers, shredders, and engulfing--predators. — Comparison of the functional structure of the exopterygote communities of headwaters with higher order streams indicated a shift from a dominance of detritivory to predation. In higher order, low gradient streams characterized by limited stable substrate, the majority of the Exopterygota are unable to use entrained food resources directly, and predation upon the filter--feeding Endopterygota (e.g. Chironomidae) may be the predominant method of feeding.

(6446) KITCHING, R.L., 1987. A preliminary account of the metazoan food webs in phytotelmata from Sulawesi. *Malay. Nature J.* 41: 1-12. — (Dept Ecosyst. Manag., Univ. New England, Armidale, N.S.W. 2351, AU).
Accounts of the food webs contained within selected phytotelmata from northern Celebes (= Sulawesi), Indonesia are presented. Results from water bodies contained in bamboo internodes, stump-holes and pitchers of Nepenthes maxima are included. Food webs in each of these are allochthonous being used entirely on energy input in the form of animal and plant detritus entering the habitats. The bamboos contained a variety of saprophagous mosquito and midge larvae, some copepods and two species of predatory toxorhynchitine larvae. Water-filled stumps and treeholes contained saprophagous gastropods, scirtid, culicid, ceratopogonid, and tipulid larvae plus a suite of predatory mosquito and occasional tanypodine larvae. The wood web was completed by the larvae of the dragonfly Lyriothemis cleis, which acts as a top predator within the community. The pitchers contained saprophagous culicid and ceratopogonid larvae, anaoetid mites and occasional predatory syrphine larvae. The results are discussed in ligth of similar results obtained elsewhere in the region where possible.

(6447) ŁABEDZKI, A., 1987. Ważki (Odonata) Puszcy Zielonki kolo Poznania. — Dragonflies (Odonata) of Zielonka Forest near Poznań. *Bad. fiziogr. Pol. zach.* (C) 35: 41-52. (Pol., with Engl. s.). — (Osiedle 40-Lecia, PRL 1 m. 8, PO-62-004 Czerwonak).
The odon. fauna of the Zielonka Forest nr Poznań, Poland is described and discussed. Among the 44 spp. recorded, Chalcolestes viridis, Lestes barbarus, Nehalennia speciosa, Aeshna juncea, E. viridis, Libellula fulva, Sympetrum striolatum and Leucorrhinia caudalis are of particular interest. It is suggested that Aeshna cyanea and A. grandis may breed also in the streams.

(6448) MÜLLER, J., 1987. Liste der im Bezirk Magdeburg gefährdeten Libellenarten (Insecta, Odonata — Stand: September 1987) und Hilfsprogramm für deren Artenschutz. *Mitt. Artenschutz Magdeburg* 10(5): 1-8. — (Pablo--Neruda-Str. 9, DDR-3034 Magdeburg, GDR).
Out of the 58 locally recorded spp., 32 are listed and their local status is specified. Tentative protective measures are suggested for various types of habitats.

(6449) PRENDERGAST, N., 1987. *Odonata stamps.* Bicester, UK. 3 pp. Stencil. — (Available from Dr D.M. Johnson, Dept Biol. Sci., East Tennessee St. Univ., Johnson City, TN 37614, USA).
This is the most comprehensive catalogue of postage stamps featuring dragonflies, updated to mid 1987. About 80 stamps are listed in 4 sections, viz. (1) Dragonfly is the central theme (taxonomic names and systems after Davies & Tobin); (2) Dragonfly is the central theme, but the sp. could not be identified, (3) Dragonfly is stylised or not the central theme (incl. brief description of the composition), and (4) Odonatologists. For all stamps the country, year of issue, nominal value and the Stanley/Gibbons catalogue numbers are stated. Appended are "Notes", "References" and "Bibliography". — For additional information cf. *Selysia* 17(2): 14; 1988.

(6450) PUJOL-LUZ, J.R. & J.M. COSTA, 1987. Descrição da larva de Dythemis cannacrioides Calvert, 1906 (Odonata: Libellulidae). *Atas Soc. Biol. Rio de J.* 27: 9-10. (Port., with Engl. s.). — (Depto Ent., Museu Nacional, Quinta da Boa Vista, BR-20.942 Rio de Janeiro, RJ).
The exuviae is described and figured, and some notes on morphology and geographical distribution of this sp. are provided.

(6451) SANTOS, N.D. & J.M. COSTA, 1987. Descrição da ninfa de Chalcopteryx rutilans (Rambur, 1842) Selys, 1853 (Odonata: Polythoridae). *Atas Soc. Biol. Rio de J.* 27: 1-4. (Port., with Engl. s.). — (Second Author: Depto Ent., Museu Nacional, Quinta da Boa Vista, BR-20.942 Rio de Janeiro, RJ).
The ultimate instar larva, based on material from Mato Grosso, is described and figured. The possibility of a homology between the "filaments" on abd. segments 2-7(= abdominal gills) with similar structures in Euphaeidae or even in Megaloptera, Ephemeroptera and Coleoptera (Gyrinidae) is briefly touched upon, and reference is made to Fraser's opinion relative to the function of these organs.

(6452) SANTOS, N.D., J.M. COSTA & J.R.P. LUZ, 1987. Descrição da ninfa de Gynacantha membranalis Karsch, 1891 (Odonata: Gynacanthini) e notas sobre o imago. *Anais Soc. ent. Brasil* 16(2): 437-443. (Port., with Engl. s.). — (First Author: Rua Torres Sobrinho 32, Méier, BR-20.771 Rio de Janeiro, RJ).
The sp. is known from Central America, and from N and NW South America. In Brazil, it was recorded from Rio Puras (AM) and from Benevides (PA). In the present paper 3 additional localities are stated from Amazonas and Pará, the hitherto unknown larva is described and figured, and notes are given on the imago.

(6453) TERZANI, F., 1987. Odonati dell'Italia meridionale: nuovi dati (Insecta: Odonata). *Redia* 70: 229-243. (With Engl. s.). — (Mus. Zool. "La Specola", Univ. Firenze, Via Romana 17, I-50125 Firenze).
25 spp. collected at 21 localities in Campania and Calabria, southern Italy, are brought on record. Lestes dryas and Trithemis annulata are new to the fauna of Calabria.

(6454) WALDVOGEL, D., 1987. Naturkundliche Beobachtungen auf dem Schiessplatz Rheinsand bei Chur. *Jber. naturf. Ges. Graubünden* 104: 55-109. — (Im Schilf, CH-7012 Felsberg).
Coenagrion puella, Libellula depressa and Sympetrum striolatum are listed from a pond nr Chur, Switzerland, without any comments.

1988

(6455) (Anonymous), 1988. Prince opens Dragonfly Sanctuary. *Species* 11: 44.
[Verbatim]: In July [1988] the remarkable island dragonfly sanctuary, established by local people near Nakamura in Japan and described by Dr Norman Moore, Chairman of the [IUCN] Odonata [Specialist] Group [cf. *OA 6035, 6037*], was opened by Prince Aya, grandson of the Emperor. Dr Moore supplied an outline management plan for the reserve. Dr Asahina, a member of the OSG, and Mr Sugimura, the originator of the project, guided the royal party on the nature trail which enables visitors to see the dragonflies without damaging the habitat.

(6456) (Anonymous), 1988. Vuoden 1987 tulokset 21 suomalaisen hyönteislajin levinneisyyskartoituksesta. — Resultat av kartering av 21 insektarters utbredning i Finland år 1987. — Results of the mapping in 1987 of the distribution of 21 insect species in Finland. *Notul. entomol.* 68: 9-24. (Finn. & Swed., with Engl. s.). — (Reprints available from: Div. Ent. Mus. zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki).
This is the continuation of the series listed in *OA* 5159. Pts 5 and 6 were published in resp. *Notul. entomol.* 66 [1986]: 105-120 and 67 [1987]: 17-32.

(6457) AAGAARD, K., 1988. [Book review]. Askew, R.R., 1988, The dragonflies of Europe. *Fauna norv.* (B)35: 94-95. (Norv.) — (Appl. Ecol. Res. Progr., Mus., Univ. Trondheim, Erling Skakkes gt. 47, N-7000 Trondheim).
Book review of the volume listed in *OA* 6357.

(6458) AAGAARD, K., 1988. [Book review]. Sandhall, A., 1987, Trollsländor i Europa.

Fauna norv. (B)35: 95. (Norv.). — (Appl. Ecol. Res.Progr., Mus., Univ. Trondheim, Erling Skakkes gt. 47, N-7000 Trondheim).
Book review of the volume listed in *OA* 6153.

(6459) *ANNUAL REPORT OF THE INTERNATIONAL ODONATA RESEARCH INSTITUTE, No. 1 (1986), 1988. Soc. Int. Odonatol. (S.I.O.), Gainesville, FL, USA. VI+26* pp. — (Available from the S.I.O. Central Office, P.O. Box 256, NL-3720 AG Bilthoven; price: Hfl. 10.- net).
With unfortunate delay, the first issue of this new S.I.O. series has appeared on Dec. 1, 1988. It is edited by Prof. Dr M.J. Westfall and Dr S.W. Dunkle, and is intended to report on the development and activities of the S.I.O. International Odonata Research Institute (I.O.R.I.), located at present in Gainesville, Florida, USA, and led by Dr M.J. Westfall (Director) and Dr S.W. Dunkle (General Manager). — Contents: *Kiauta, B.:* The path towards the International Odonata Research Institute (pp. 1-5); — *Dunkle, S.W.:* Annual report I.O.R.I. 1986 (pp. 7-11: "Introduction", "Present facilities", "Future facilities", "Incorporation", "Visitors", "Financial donations", "Collection donations", "Archives", "Personal service"); — *Westfall, M.J.:* Appendices (pp. 13-26, giving the list of the "I.O.R.I. Policy Board members", and verbatim text of the following documents: "Memorandum of understanding between the International Odonatological Society and the Florida State Collection of Arthropods on the mutual benefits of cooperation in the International Odonata Research Institute", "Articles of incorporation of International Odonata Research Institute", "Facsimile of the Incorporation certificate by the Florida Secretary of State"). — (*Abstracter's Note:* This issue was sent free to all S.I.O. members-in-good-standing on Dec. 1, 1988, and to all institutional subscribers to *Odonatologica.* The subsequent parts will be supplied to the subscribers of the *Annual Report* only. Subscriptions are accepted by the S.I.O. Central Office (address above), by the I.O.R.I., and by all S..O. National and Regional Offices).

(6460) ARAI, Y., 1988. Ecological and morphological notes on Polycanthagyna melanictera (Selys). *Nature & Insects* 23(10): 24-27. (Jap., with Engl. title). — (1233-2, Oaza Suezo, Yorii-machi, Osatu-gun, Saitama Pref., 369-12, JA).
Abstract not available.

(6461) ASAHINA, S., 1988. A revisional study of Kashmir and Japanese "Aeschna mixta". *Gekkan Mushi* 211: 11-20. (Jap., with extensive Engl. s.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
A. mixta from Kashmir, India is described, figured and compared with the European material. Its affiliation to the nominate spp. is confirmed. For the population of northern Japan, A. m. soneharai ssp. n. is erected (holotype ♂, allotype ♀: Tokita, Saku-shi, 30-VIII-1963; in author's coll.), described and compared with the nominate ssp. The larvae of the 2 taxa are also described and figured. Detailed descriptions, lists of material examined, and captions of the figs are given in Engl.

(6462) ASIRELLI, S., 1988. Un artificiale al mese: libellula — Tombo. *Pescare* 26(10): 115. — (Author's address not stated).
A tying is described imitating an adult dragonfly and available in 3 colour versions (weight 8 g, length 8 cm) under the trade-name "Tombo", and applicable for fishing in dense vegetation. — (For some other dragonfly tyings cf. *OA* 2962, 3130, 4428).

(6463) AUFFENBERG, W. & T. AUFFENBERG, 1988. Resource partitioning in a community of Philippine skinks (Sauria: Scincidae). *Bull. Fla St. Mus.* (Biol.) 32(3): 151-219. — (Dept Herpetol., Florida St. Mus., Univ. Florida, Gainesville, Fl 32611, USA).
11 variously sympatric spp. of skinks were studied in southern Luzon, the Philippines. Food analyses were based on a total of 2481 adult specimens, collected in monthly samples of about 30 individuals of each sp. for a period of 1 yr. Almost no evidence of food niche partitioning was found in most spp. Seasonal switching of prey types was common among almost all spp., and was directly related to insect abundance Odon. represented only 0.08% of the total items taken, and were found

in Mabuya multifasciata, M. multicarinata and Lamprolepis smaragdina only.

(6464) BAIRD, J.M. & M.L. MAY, 1988. Behavioral ecology of foraging by Pachydiplax longipennis (Odonata: Libellulidae). *Proc. XVIIIth Int. Congr. Ent. Vancouver*, p. 219. [Abstract only]. — (Second Author: Dept Ent. & Econ. Zool., Rutgers Univ., New Brunswick, NJ 08903, USA).
[Verbatim]: Food intake, prey availability, prey capture behavior, and aggressive behavior at feeding areas were studied in P. longipennis at Gainesville, FL, USA. Behavior was quantified by observations of focal individuals on artificial perches at varying densities. Prey availability was assessed visually and with sticky traps. Weather conditions and numbers of P. longipennis were monitored periodically. Prey capture success was high and relatively constant, but frequency of feeding flights depended on temperature, sunlight, prey density, and the density of other dragonflies. Prey density was highly variable; individual P. longipennis were attracted to localized prey concentrations. Both sexes, but especially males, initiated aggressive interactions: sexual interactions were usually absent. At least at low dragonfly dentities, individuals appeared to defend territories. Near very dense prey concentrations, aggression declined as feeding activity became very intense.

(6465) BELLE, J., 1988. Epigomphus gibberosus, a new species from Peru, with lectotype designations for the eligible species of the genus Epigomphus (Odonata: Gomphidae). *Tijdschr. Ent.* 131: 135-140. — (Onder de Beumkes 35, NL-6883 HC Velp).
E. gibberosus sp. n. is described and figured after a single male, deposited in Mus. Zool., Univ. Michigan, Ann Arbor (Depto San Martin, Soritor, alt. 900 m; 19-X-1936). The lectotypes are designated for obtusus Sel., subobtusus Sel., quadracies Calv., tumefactus Calv. and armatus Ris, and a list is given of the 20 known spp., with type locality data and with statements on the location of the types.

(6466) BEUTLER, H., 1988. Libellen aus der Region Banat, Rumänien (Odonata). Opusc. zool. flumin. 30: 1-15. (With Engl. s.). — (Frankfurter Str. 23, Postfach 63-31, DDR-1230 Beeskow, GDR).
A list of all regional spp. (33 or 34) is given. During a short trip on the southern slopes of the Carpathians, in summer 1987, 30 spp. were evidenced, of which Cordulegaster heros Theischinger and Somatochlora meridionalis Nielsen are new to the fauna of Romania. The 160 collected specimens were measured and biometrically analysed. Field observations and notes on morphological features of some locally interesting spp. are provided.

(6467) BRAUCKMANN, C., 1988. Hagen-Vorhalle, a new important Namurian Insecta-bearing locality (Upper Carboniferous, FR Germany). *Entomol. gener.* 14(1): 73-79. (With Germ. s.). — (Fuhlrott-Mus., Auer Schulstr. 20, D-5600 Wuppertal-1, FRG).
The locality in the Ruhr area (Middle Namurian) so far yielded about 60 specimens of Palaeodictyoptera, Megasecoptera, Odon. (Meaisoptera) and "Protorthoptera", referable to 12 spp. The composition of the fauna is briefly discussed, with reference to its affinities to other faunas of approx. the same age, and with reference to the palaeoenvironment. — It contains 2 odon. spp. Of these, Erasipteroides valentini has been described earlier (cf. *OA* 5219), but "Namurotypes sippeli Brauckmann & Zessin, 1988" is listed here for the first time. Its description is said to be "in press" in *Dt. ent. Z.* (N.F.) 35; consequently, the name here is a nomen nudum.

(6468) CARVALHO, A.L., 1988. Descrição da larva de Triacanthagyna ditzleri Williamsoni, 1923 (Odonata, Aeshnidae, Gynacanthini). *Revta bras. Ent.* 32(2): 223-226. (Port., with Engl. s.). — (Depto Ent., Museu Nacional, Quinta da Boa Vista, BR-20.942 Rio de Janeiro, RJ).
The ultimate instar larva is described and figured, based on larvae and exuviae of reared specimens. Some notes on biology are added.

(6469) CEMPIREK, J., 1988. Sameček vážky jasnoskvrnné (Leucorrhinia pectoralis). — [The male of Leucorrhinia pectoralis]. *Živa* 74(4):

121. (Czech). — (Notolická 18, CZ-370 05 České Budějevice).
A frontispiece photograph, in the caption of which it is stated this is a rather uncommon sp. in Czechoslovakia, appearing sporadically in southern Bohemia. The male shown was photographed at Hluboká-u-Borovan, 6-VII-1985.

(6470) *CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS* — [*Newsletter of the Netherlands Dragonfly Workers*], No. 16 (Nov., 1988). (Dutch). — (c/o Miss K. Verspui, Westerkade 27 bis, NL-3511 HC Utrecht).
Editorial (p. 1); — *Verhaar, H.:* Announcement of the 14th Annual Colloquium of the Netherlands Dragonfly Workers (p. 2; Apr. 15, 1989, Deventer); — *Verspui, K.:* Announcement of the 10th International Symposium of Odonatology (pp. 2-3); — Ponderings on the 13th Colloquium of the Netherlands Dragonfly Workers (pp. 3-4); *Jansen, K.C.:* The dragonflies of the Drenthe province, 1975-1988 (pp. 4-6; with a checklist); — *Verdonk, M.:* Interesting records (pp. 6-9); — Book reviews, by *M. Wasscher, K. Verspui & M. Wasscher* and *H. Verhaar* (pp. 9-15); — *Wasscher, M.:* The 1988 dragonfly year (pp. 15-16); — Notifications (p. 16).

(6471) CONVEY, P., 1988. Competition for perches between larval damselflies: the influence of perch use on feeding efficiency, growth rate and predator avoidance. *Freshw. Biol.* 19(1): 15-28. — (Dept Zool., Univ. Cambridge, Downing St., Cambridge CB2 3EJ, UK).
In an investigation of perch use by larval Coenagrion puella and Ischnura elegans, larvae spaced out on a grid of vertical cocktail sticks, in the absence of food, to a greater extent than expected from a random model. Spacing was the tesult of direct interaction between larvae, and was not related to the level of hunger of the larvae over a 10 day starvation period. — (2) Prior ownership of a perch was not a predictor of success in conflicts between larvae of the same instar. In contests between different instars larger larvae were more likely to win conflicts. Some small larvae appear to remain undetected in the presence of larger conspecifics. — (3) At one level of food availability, perch ownership did not influence growth rate or mortality of C. puella or I. elegans. However, it did allow greater prey capture success rate. —(4) C. puella larvae showed more movement in the absence of perches both in terms of actual distance moved and amount of swimming activity. The amount of swimming activity was reduced by addition of a predator (sticklebacks, Gasterosteus aculeatus or Pungitius pungitius) to the tank both in the absence and presence of an alternative food supply for the fish. Duration of individual swimming bouts was unaffected. — (5) Sticklebacks attacked C. puella larvae significantly more often in the absence of perches, with a strong bias towards swimming larvae. — (6) It is proposed that the major advantage of perch possession to C. puella larvae is in the reduction of predation as a consequence of the reduction in larval movement.

(6472) CORBET, P.S., [Ed.], 1988. Current topics in dragonfly biology, Vol. 3: A discussion focussing on the seasonal ecology of Pantala flavescens in the Indian Subcontinent. *Soc. int. odonatol. rapid Comm.* (Suppl.) 8: VIII+24 pp. — (Old Manse, 45 Lanark Rd, Edinburgh, EH14 1TL, Scotland, UK). — (The booklet is available from the S.I.O. Central Office, P.O. Box 256, NL-3720 AG Bilthoven. — Price: Hfl. 20.- net; — Vols 1-3, with Standing Order: Hfl. 50.-.
This is the transcript of a tape-recorded discussion, conducted during the "Corbet Seminar", in the framework of the IXth Int. Symp. Odonatol., Madurai, India, January 1988. At variance with the previous 2 volumes (cf. *OA* 4563, 6436), the present booklet is devoted entirely to the biology of Pantala flavescens, save for a brief introductory discussion on "Priorities for research in the Indian Subcontinent". The main chapters are: "Seasonal distribution of Pantala flavescens", "A system for collating observations", Larval ecology", and "Pantala flavescens: needed information". Prof. *P.S. Corbet* was the moderator, and the text was contributed by *S.H. Chowdhury, D.M. Johnson, B. Kiauta, A. Kumar, A.R. Lahiri, P.L. Miller, T.R. Mitra,*

G. Pritchard, B.K. Srivastava, B. Suribabu, D.B. Tembhare, and *B.K. Tyagi.* — (*Abstracter's Note:* The present publication largely has the character of a trend-setting work for pending odonatological research in southeastern Asia. It is to be followed by a similar volume on the role of Odon. in mosquito control, which is likely to be the subject of one of the forthcoming seminars).

(6473) COSTA, J.M., 1988. Contribution to the study of the immature forms of the genus Oxyagrion Selys, 1876 with the description of larva of Ox. santosi Martins, 1967 (Odonata: Coenagrionidae). *Proc. XVIIIth Int. Congr. Ent. Vancouver,* p. 64. [Abstract only]. — (Dept Ent., Museu Nacional, Quinta da Boa Vista BR-20942 Rio de Janeiro).
Of the 18 described spp., immature forms are known for 11. O. santosi was described from adults collected in São Paulo, Minas Gerais and Paraná (Brazil). Analysis of the morphological characters of both adults and immature forms shows that this sp. is close to O. terminale Sel., 1876 and O. pavidum Sel., 1876. However, the adults differ from Ox. terminale by the small pterostigma and short anal appendages, which are distally enlarged, and from O. pavidum by the presence of small projections at the extremities of the superior anal appendages, easily seen in profile. The immature forms differ from the other 2 spp. by having the tracheal gills not branched.

(6474) CROWLEY, P.H., S. GILLETT & J.H. LAWTON, 1988. Contests between larval damselflies: empirical steps toward a better ESS model. *Anim. Behav.* 36(5): 1496-1510. — (First Author: T.H. Morgan Sch. Biol. Sci., Univ. Kentucky, Lexington, Kentucky 40506, USA).
Some hypotheses about facultatively aggressive interactions among Zygoptera larvae have recently been generated from a model (cf. *OA* 4838) based on the theory of evolutionarily stable strategies (ESS). The present study tests some of the assumptions and predictions of this ESS model with larvae of Ischnura elegans in 2 sets of laboratory experiments. In contest experiments, interactions between 2 larvae on a thin dowel were observed in all possible combinations of the final 3 instars. The tendency to maintain control of the site and to evict the opponent was positively related to hunger, relative size (instar difference), and aggressiveness (labial striking), but negatively related to advancing toward a similar-sized opponent along the dowel. Contests were longer and involved more physical contact when larvae were more similar in size. No injuries or mortality resulted from the observed encounters. In distraction experiments, individual larvae were placed in a small feeding chamber with daphnid prey. Experimental larvae were surrounded by last-instar larvae visible through clear plastic walls; controls had no surrounding larvae. Time spent staring at others carried a feeding cost. This cost, the observed negative-exponential distributions of contest duration, and the apparent rarity of dangerous aggression, suggest that contests between similar-sized larvae could be considered wars of attrition. Other possible interpretations and some implications of these behaviour patterns for vulnerability to other predators are noted.

(6475) DANKS, H.V., 1988. Insects of Canada. *Document Ser. biol. Surv. Can.* 1: 1-18. — (Biol. Surv. Canada, Ent. Soc. Can., 1320 Carling Ave., Ottawa, Ont. K1Z 7K9, CA).
This first issue of the new series is a synopsis prepared for participants at the XVIIIth Int. Congr. Ent., Vancouver, 1988. So far 194 odon. spp. are known from Canada, and it is expected that another 3 spp. are either still unrecorded or undescribed.

(6476) DÖLER, H.-P., 1988. Zur Odonatenfauna der Ostalb. Hülben und Weiher als Lebensraum für gefährdete Libellenarten. *Veröff. Naturschutz Landschaftspflege Bad.-Württ.* 63: 211-235. — (Breuningstr. 9, D-7400 Tübingen, FRG).
The odon. fauna (26 spp.) of the Albuch/Härtsfeld region of the Ostalb, Baden-Württemberg, southern Germany is discussed. Aeshna juncea is the dominant sp., and Coenagrion hastulatum, Leucorrhinia dubia and Sympetrum flaveolum are locally autochthonous. Measures for the conservation of

some primary odon. habitats are advocated.

(6477) DONATH, H., 1988. Bericht über die 2. Tagung des Arbeitskreises Fauna der DDR — Odonata. *Ent. Nachr. Ber.* 32(1): 33-34. — (Hauptstr. 36/37, DDR-7960 Luckau, GDR).
Exhaustive report on the 2nd Colloquium of the East-German "Arbeitskreis Odonata" (AKO = Association of Dragonfly Workers), Sept. 4-6, 1987, Schlepzig. The Association has 52 members (Oct. 1987), of which 34 attended the meeting. The informal "Welcome Party" was followed by a slide program (H. Donath). In the scientific sessions papers were presented by I. Hiekel, A. Arnold, R. Mauersberger, Dr W. Zessin, T. Brockaus and Dr J. Müller. In the framework of the Colloquium 2 field trips were also organised. The 3rd Colloquium is to be convened in Sept. 1989, at Karl-Marx-Stadt. — (For the First Colloquium of East-German Odonatologists cf. *OA* 5718).

(6478) DONATH, H., 1988. Die Libellen der nordwestlichen Niederlausitz (Teil 2). *Biol. Stud. Luckau* 17: 16-23. — (Hauptstr. 3637, DDR-7960 Luckau, GDR).
Continuation (Lestidae, Calopterygidae) of series listed in *OA* 6121.

(6479) DÖRFLER, S., 1988. Libellen — Akrobaten unter den Insekten. *Ökowerk Mag.* 2(5): 4-8. — (Quäkerstr. 33, D-1000 Berlin-5, Westberlin).
Gives names (and characteristic spp.) of a number of Westberlin dragonfly localities. In the editorial note, the author is characterised as one of the greatest authorities on the Odon. of Berlin.

(6480) DREYER, W., 1988. Zur Ökologie der Hochmoorlibellen. *Bonn. zool. Beitr.* 39(2/3): 147-152. (With Engl. s.). — (Zool. Mus., Hegewischstr. 3, D-2300 Kiel-1, FRG).
Ecological propensities of the sphagnum-bog inhabiting European Odon. are outlined. These represent 11% of the Europ. odon. fauna. The factors influencing their life under these extreme conditions are, (1) pronounced fluctuations in acidity, (2) pronounced daily temparature variation, (3) low secondary production, (4) deficiency in vertical structuring of aquatic vegetation, and (5) the habitat isolation. The dragonfly adaptations to these conditions are discussed. The 2-dimensional vegetation structure prevailing in moorland ponds is considered an important factor in immigration control. The eutrophic habitats are characterised by better vertical structuring of vegetation, allowing the immigration of spp. with endophytic oviposition habits.

(6481) DUNN, G.A., 1988. *Y.E.S. international entomology resource guide.* Young Entomologists' Soc., Special Publ. No. 2, II+75 pp. — (Author: Dept Ent., Michigan St. Univ., East Lansing, MI-48824-1115, USA).
A useful catalogue of addresses of suppliers of entomological equipment, literature, specimens and live stocks, of some entomol. organizations, insect houses, etc. It is strongly "American" and "Western Europe" oriented, giving e.g. no addresses from Japan. As suppliers of live Odon. are listed (1) Carolina Biological Supply Co. (2700 York Rd, Burlington, NC 27215, USA *and* P.O. Box 187, Gladstone, OR 97027, USA), (2) Connecticut Valley Biological Supply Co. (P.O.B. 326, Southampton, MA 01073, USA), and (3) NASCO West Inc. (P.O. Box 3837, Modesto, CA 95352, USA).

(6482) EARL OF CRANBROOK & J.I. FURTADO, 1988. [Key environments of Malaysia:] Freshwaters. *In:* Earl of Cranbrook, [Ed.], Key environments Malaysia, pp. 225-250, Pergamon Press, Oxford-New York-[etc.]. ISBN 0-08-028866-9. — (Second Author, last known address: Commonwealth Science Council, Commonwealth Secretariat, Marlborough House, Pall Mall, London, SW1Y 5HX, UK).
The Second author graduated from the Univ. of Malaya (1966) with a PhD dissertation, entitled "Studies on Malayan Odonata, with special reference to larval ecology" (Kuala Lumpur, 280 pp., figs & tabs excl.), and was subsequently engaged in odonatol. research (cf. also *OA* 501, 662, 842, 1700), therefore his brief characterisation of the Malayan odon. fauna here is particularly valuable. The known Peninsular fauna comprises 187 spp.

On the basis of adult communities, studied by the Second Author, sets of forest stream odon. have been recognized in Selangor. Here Piptospatha streams, where torrential, are characterized by Coeliccia albicauda, Calicnemia chaseni, Indocnemis orang, Devadatta argyroides, Euphaea ochracea and Rhinocypha fenestrella, and, where non-torrential, by Sundacypha petiolata and Echo modesta. Upper Saraca streams are characterized by Euphaea ochracea, Rhinocypha perforata, Zygonyx iris; middle Saraca streams by Neurobasis chinensis, Megalogomphus sumatranus, Gomphidia abbotti, Onychothemis coccinea and O. culminicola, and lower Saraca streams by Copoea marginipes, Libellago lineata, Rhinocypha biseriata, Vestalis gracilis, Ictinogomphus decoratus, Onychothemis testacea. Blackwater and slow flowing lowland streams are characterized by Prodasineura interrupta, Elattoneura analis, Libellago aurantiaca, Euphaea impar. The odon. of Tasik Bera comprise 33 spp., with libellulids (22 spp.) predominant. Odon. larvae form 8.5% of the macro-invertebrate biomass.

(6483) FAIRCHILD, W.L., 1988. Perturbation of the aquatic invertebrate community of bog ponds by the insecticide fenitrothion. *Proc. XVIIIth Int. Congr. Ent., Vancouver*, p. 190 [Abstract only]. — (Dept Biol., Univ. New Brunswick, Fredericton, N.B., E3B 6E1, CA). [Verbatim]: In June of 1984 and 1985, fenitrothion was applied experimentally to acidic (pH 4) bog ponds at operational rates for forestry of 2-times 210 g active ingredient per hectare. Maximum recorded postspray insecticide residue concentrations in water ranged from 42 to 81 μg/l. 6 weeks after spraying, concentrations in water ranged from non-detectable to 0.06 μg/l. However, residue traces reappeared 1 yr after spraying in water (0.3 μg/l), sphagnum moss (8-10 pg/g) and sediment (< 0.01 pg/g). Total aquatic insect density was reduced and took over 12 months to return to control densities. Nematodes and annelids became more abundant after spraying, while most insects became less abundant. Chironomids and ceratopogonids, which were numerically dominant, had their abundance reduced by more than half. Other insect groups most affected include Coleoptera, Hemiptera, and Odon. Gyrinidae, initially eliminated by spraying, increased above prespray levels by the end of summer.

(6484) GAUTHIER, A., 1988. Les Anax de Madagascar, avec la description d'une nouvelle espèce: A. mandrakae n. sp. (Odonata: Aeshnidae). *Bull. Soc. Hist. nat. Toulouse* 124: 191-195. (With Engl. s.). — (Lab. Ent., Univ. Paul Sabatier, 118 route de Narbonne, F-31062 Toulouse).
A. mandrakae sp. n. is described and figured (♂ holotype ♀ allotype: La Mandraka, Madagascar, 8-VI-1968, deposition not stated), a key to the adults of the Malgassian members of the genus is presented. A. tristis is reported for the first time from the Great Comoro Island.

(6485) GERKEN, B., 1988. *Auen: verborgene Lebensadern der Natur.* Rombach, Freiburg/Br. 132 pp., numerous (incl. col.) figs. ISBN 3-7930-0514-3. Hard cover. Price in Germany: DM 39.80. Available also from the SIO. — (Author: Lehrgeb. Tierökol., Univ. Paderborn, An-der-Wilhemshöhe 44, D-3470 Höxter, FRG.
An "introduction" to the morphology, ecology, biotic communities and conservation of the European back waters. The Odon. are dealt with on pp. 68-74. — (Cf. also *OA* 4309).

(6486) GOTCEITAS, V. & P.COLGAN, 1988. Individual variation in learning by foraging juvenile Bluegill sunfish (Lepomis macrochirus). *J. comp. Psychol.* 102(3): 294-299. — (Dept Biol., Queen's Univ. , Kingston, Ont. K7L 3N6, CA).
The individual variation in juvenile Bluegill Sunfish's learning to forage on a novel food item was investigated. They were given the opportunity to forage on Zygopt. larvae daily for 10 days. Each day 3 behavioural measures, latency until first capture, foraging success, and rate of prey capture, were recorded for each fish. By regression analysis each measure was fitted by an apporpriate descriptive function, and the effects of time (i.e. days of exposure) and individual fish were tested.

Time had a significant effect on all 3 measures, which indicates learning by the fish. Individual differences in learning ability were evident from a significant effect of fish on latency and capture rate. — The odon. larvae were most vulnerable to attack if swimming. Crawling along the bottom or walls of the basin and side-to-side movements of the abdomen also increased the chance of a larva to get detected and attacked. Motionless prey were regularly overlooked. If a larva moved and then subsequently stopped when noticed by a Bluegill, the fish often lost interest in it. Only after 3 or 4 exposures did Bluegills consistently attack prey even if motionless.

(6487) HARITONOV, A.Yu., 1988. Metody opredeleniya plotnosti populaciy strekoz. — [Methods for density calculation of dragonfly populations]. *In:* Ekologiya populyaciy, Vol. 2, pp. 47-49, Akad. Nauk., Moscow. (Russ). — (Inst. Biol., Siberian Section USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).
This is the abstract of a paper presented at the All-Union Symposium on Population Ecology; the Editor and the ISBN are not stated. — 4 methods, used by the author during the past 20 yrs, are described. Their applicability depends on the character of the field work (stationary at a defined locality with capture-mark-recapture possibilities; single, long-distance trek through a large area), and on the taxa (Zygopt., Anisopt.) or stages (adult, exuviae) involved.

(6488) HARITONOV, A.Yu., 1988. Strekozy roda Ischnura Charp. (Insecta: Odonata) fauny SSSR. — [Dragonflies of the genus Ischnura Charp. (Insecta: Odonata) of the USSR fauna]. *In:* G.S. Zolotarenko, Ed., Taksonomiya zhivotnyh Sibiri, pp. 32-46, Nauka, Novosibirsk, ISBN 5-02-028880-2. (Russ.). — (Inst. Biol., Siberian Section, USSR Acad. Sci., Ul. Frunse 11. USSR-630091 Novosibirsk).
More than 10 spp. pertaining to this genus have been recorded or described from the USSR territory. Some of these were wrongly identified, while the names of some others appear junior synonyms. The present revision therefore, represents a long needed and highly appreciated contribution to our knowledge on the taxonomy of the genus in the temperate zone of the Old World. — The recognized spp. of the USSR fauna are elegans, pumilio, lobata, evansi, fountainei, forcipata and aralensis. I. bukharensis Bartenev, 1913 is synonymised with I. fountainei Morton, 1907, and I. musa Bartenev, 1913 with I. forcipata Morton, 1907. The holotype and a paratype of I. ordosi Bartenev, 1911 were examined; they appear "extremely close" to I. elegans (Vander L.), therefore the status of ordosi is questioned. A series of specimens in Inst. Zool., USSR Acad. Sci., bearing Bartenev's and D'yakonov's labels "I. senegalensis" merely represents the aurantiaca females of fountainei. Consequently, senegalensis should be removed from the USSR list. The forcipata/intermedia problem is discussed in considerable detail. The specimens from Soviet Central Asia combine features of both spp., but appear "closer" to intermedia. The material the author had at his disposal was considered insufficient to settle this controversy. Preliminarily, however, 2 options are tentatively offered, viz. (1) forcipata is subject to a pronounced geographic variation, in which case forcipata s. str. and intermedia Dumont, 1974 solely represent the extremes of a clinal series, by which musa is also covered [and, therefore, the latter 2 taxa of course fall into synonymy, though in the present paper this has been done with musa only]; (2) the 3 named taxa would appear geographically well-defined subspecies of forcipata (f. forcipata: southern Asia, — f. musa: central Asia, — f. intermedia: Asia Minor?, Nepal?); if only 2 of these are good sspp., intermedia becomes a junior synonym of musa. — All recognised taxa are described, figured and keyed, their distribution is outlined, their structural affinities discussed, and notes on their larval stages, habitats and biology are provided.

(6489) HENRIKSON, B.-I., 1988. The absence of antipredator behaviour in the larvae of Leucorrhinia dubia (Odonata) and the consequences of their distribution. *Oikos* 51(2): 179--183. — (Dept Zool., Univ. Göteborg, P.O. Box

25059, S-400 31 Göteborg).
Acidified bog ponds were the only previously reported habitat of L. dubia. In order to establish its present range of habitats, 20 lakes in SW Sweden were sampled, 10 of which supported fish, the other were fishless and acidified. L. dubia was found to occur in all 10 fishless lakes, but in none of the others. In order to test the hypothesis that the distribution is conditioned by the occurrence of fish, laboratory experiments were conducted where perch (Perca fluviatilis) was shown to discover and catch significantly more L dubia larvae than those of any other odon. sp. inhabiting the lakes. When exposed to a simulated fish attack, the larvae of L. dubia tried to escape, while those of Orthetrum coerulescens and Libellula quadrimaculata feigned death. These observations, combined with earlier evidence on L. dubia dial activity, suggest that L. dubia is more susceptible to fish predation than are the larvae of the other anisopteran spp. of the Swedish fish lakes.

(6490) HUIJS, L.G.J., 1988. Libellen in een stadspark. — Dragonflies in a city-park. *Levende Nat.* 89(3): 167-172. (Dutch with Engl. s.). — (Dukaatstraat 85, NL-6532 RG Nijmegen).
The odon fauna (22 spp.) of a city park (surface 80 ha) in Nijmegen, the Netherlands is discussed. The distribution patterns of 7 spp. are correlated with differences in landscape elements. Several management options, relative to the conservation of the local odon. fauna, are briefly outlined.

(6491) JOHNSON, D.M., C.N. WATSON, T. FORSYTHE & C.N. BOEHMS, 1988. Larval damselfly coexistence with green sunfish. *Proc. 1st a. Symp. nat. Hist. Lower Tennessee & Cumberland R. Valleys,* pp. 314-325. — (First Author: Dept Biol. Sci., East Tennessee St. Univ., Johnson City, TN 37614, USA).
The hypothesis put forward in the paper listed in *OA* 3183, and suggesting that larval Zygopt. cannot coexist with fish predators specialized at exploiting fauna of littoral vegetation was tested at 3 ponds at the Tennessee Valley Authority's "Land between the Lakes", in western Tennessee and Kentucky USA (July & Oct., 1986). The evidence is not consistent with the hypothesis: in both months the largest percentage of Zygopt. was found in ponds with green sunfish, Lepomis cyanellus.

(6492) KETELAAR, R., 1988. Libellen. *Marel* 31(3): 29-33. (Dutch). — (Zwinstraat 18, NL-7417 CJ Deventer).
Distribution maps for 24 odon. spp. in the province of Noord Holland, the Netherlands.

(6493) KLOPSTRA, A., 1988. Micro-milieus bij Calopteryx splendens en virgo. — [Microhabitats of Calopteryx splendens and C. virgo]. *Kikkervis* 1988(1): 16-17. (Dutch). — (Veenluydenstraat 57, NL-7906 HE Hoogeveen).
Notes and larval habitats, at Bergeijk, Noord Brabant prov., the Netherlands, April 5-9, 1988.

(6494) KORN, M., 1988. Erstnachweis der Südlichen Binsenjungfer (Lestes barbarus) auf Helgoland. *Seevögel* 9(2): 25. — (Köslinerstr. 8, D-2820 Bremen-77, FRG).
As predicted already by Eb. Schmidt (*OA* 3277), Lestes barbarus was now recorded from the Northsea island of Helgoland. So far 36 odon. spp. are known from there.

(6495) KUKALOVA-PECK, J., 1988. Leg-based appendages of Carboniferous insects and their probable equivalents in recent embryos. *Proc. XVIIIth Int. Congr. Ent., Vancouver,* p. 72. [Abstract only]. — (Dept Earth Sci., Carleton Univ., Ottawa, Ont., K1S 5B6, CA).
[Verbatim]: Abdominal segments of juvenile Carboniferous insects often bear abdominal leglets (sometimes with double claws) and/or leg-derived appendages (exites, endites). So far, leglets have been found in Archeognatha, Monura, Diaphanopterida, Megasecoptera, some Paleodictyoptera, Protodonata, undetermined Neoptera, and Endopterygota (eruciform-like larva of Meco-Hymenopteroidea); leglets, coxal and trochanteral vesicles (endites) in Thysanura; and leglets and plate gills (exites) in Ephemerida and Paraplecoptera. Both insect nymphs and larvae are primitively polypod. Rudiments of leglets and

endites occur in Recent endopterygote embryos. The ground-plan of the insect abdomen has a triangular sternum and 4 pairs of leg-derived appendages inserted by leg muscles. The author suggests that leg-derived rudiments have the potential to reappear later in evolution in some endopterygote larvae.

(6496) LENAT, D.R., 1988. Water quality assessment of streams using a qualitative collection method for benthic macroinvertebrates. *Jl N. am. benthol. Soc.* 7(3): 222-233. — (Biol. Monit. Group, North Carolina Div. Environ. Manag., Archdale Bldg, P.O. Box 27687, Raleigh, NC 27611, USA).
A standard qualitative sampling technique was developed and tested for shallow streams in North Carolina. This method emphasizes multihabitat collections and the use of both coarse- and fine-mesh samples. All samples are picked in the field, a process facilitated by field-preservation of some samples. The qualitative method was found to be more rapid than a semi-quantitative technique (kick nets), yet produced a greater number of taxa per site. Different taxa richness criteria were developed for each ecoregion to assign water quality classifications, and these values were shown to be related to more conventional physical/chemical measurements. This method has potential as a rapid, inexpensive biomonitoring tool, covering also the Odon.

(6497) LEWIS, D.J., 1988. Distribution of aquatic insects in subarctic peatlands. *Proc. XVIIIth Int. Congr. Ent., Vancouver,* p. 60. [Abstract only]. — (Dept Ent., McDonald Coll., McGill Univ., Ste-Anne-de-Bellevue, Quebec, H9X 1C0, CA).
[Verbatim]: Peat samples were collected weekly from a subarctic fen in Labrador during the summers of 1985-87. Aquatic insects and other invertebrates were removed from the peat by wet extraction techniques. Dominant insects consisted of several families of Diptera (Chironomidae, Ceratopogonidae, Tabanidae and Tipulidae); Odonata, Coleoptera and Trichoptera were less common. Preliminar analyses suggest that the distribution and abundance of aquatic insects of peatlands may be influenced by the nature of the substratum, peatland flora and water level.

(6498) *MALANGPO.* Newsletter of the Thai National Office of the International Odonatological Society (S.I.O.), No. 5 (Nov., 1988).— (c/o Bro. A. Pinratana, St Gabriel's Coll., 565 Samsen Rd, Bangkok-10300, Thailand).
Under the brilliant editorship of Bro. (Dr. h.c.) Amnuay Pinratana, Head of the SIO National Office in Thailand, this, originally modest, cheaply produced newsletter written in Thai developed into a full-fledged, almost international journal, printed on high-quality paper (28x21 cm), with numerous photographs and thoughout in English. Although it still remains an annual publication, with the present issue its volume increased by 30%, and its scope and contents have by far surpassed what would be considered a normal contents of a regional newsletter. Since 1987 it became a convenient medium for publication of scientific short communications and smaller papers, relative to the odon. fauna of Thailand and Indochina. At the same time it also remains the organ for communication of personal, administrative and other news items to and from the Thai membership and all those interested in Thai dragonflies. For the time being, this is by far the most luxurious and high-standing SIO regional periodical. The annual subscription for 1989 amounts to US $ 10.- approx. Orders from all other countries than Thailand and Indochina are to be sent to the SIO Central Office in Bilthoven, The Netherlands, save for those from other South Asian countries, which are to be directed at the SIO Regional Office in Southern Asia (G-193, Shastri Nagar, Jodhpur-342003, Rajasthan, India.) All workers who have anything to report on the Thai or Indochinese fauna are invited to send their manuscripts to Bro. Pinratana, Bangkok (address above). — (Contents of the present issue: *Pinratana, A. & M. Hämäläinen:* Dragonflies of Khao Yai National Park (pp. 17-22); — *Hämäläinen, M.:* Dragonfly collecting in Thailand. III. September-November 1986 (pp. 23-27; — New records of Thailand: Chlorogomphus atkinsoni, by [*N*] *Somboon;* Orchithemis pulcherrima and Lyriothemis pachy-

gastra, by [*N*] *Somnuk* (p. 28).

(6499) *MARTINIA*. Bulletin de liaison des Odonatologues de France, No. 9 (Sept., 1988). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois d'Arcy).
Deliry, C.: Les odonates des départements savoyards (2ème liste) (pp. 57-60); — *Boudot, J.-P.:* Données pour une répartition de Cordulegaster boltonii immaculifrons (Sélys, 1850) en France (Odonata, Anisoptera: Cordulegastridae) (61-74); — *Papazian, M.:* Contribution à l'inventaire des Odonates du département de l'Essonne (75-76); — *Machet, P.:* A propos du "Livre des Insectes" illustré par Utamaro (77--78); — *Dommanget, J.-L.:* Rubrique bibliographique (79-80); — Analyse d'ouvrage (81--82; exhaustive review of the book of R.R. Askew, cf. *OA* 6357); — *Machet, P.:* Nouvelles philatéliques (83-84). — The issue contains also an announcement of a regional odonatol. meeting in Orleans, 20 Nov. 1988, a notification on the odon. inventarisation of the Ile-de--France, and a request for cooperation on the odon. inventarisation of the Pyrenees in France, Andorra and Spain.

(6500) MEIER, C., 1988. Naturschutzkonzept Kaltbrunner Riet. Die Libellen. *Anthos* (Spezial) 1: 57-59. — (Postfach 252, CH-8636 Wald).
The odon. fauna (27 spp.) of Nature Reserve "Kaltbrunner Riet", St Gallen, Switzerland (alt. 408 m) is listed, the strength of the local population of each sp. is stated, and a general evaluation of the fauna is presented. 3 breeding sites and 9 spp. are discussed in some detail from the conservancy point of view. Brachytron pratense and Aeshna affinis had not been previously published from the canton of St Gallen.

(6501) MICHIELS, N.K. & A.A. DHONDT, 1988. Direct and indirect estimates of sperm precedence and displacement in the dragonfly Sympetrum danae (Odonata: Libellulidae). *Behav. Ecol. Sociobiol.* 23(4): 257-263. — (Dept Biol., Univ. Antwerp, Universiteitsplein 1, B-2610 Wilrijk).
The non-territorial S. danae shows a high degree of post-copulatory mate-guarding, which suggests precedence of the last male's sperm. Irradiated male techniques revealed that the last male that mates with a female fertilizes an average of 95% (100% in 28% of the cases) of the clutch laid immediately after copulation, irrespective of any previous matings. Sperm volume estimates in both sexes and sperm opacity changes in females at 7 stages of copulation and oviposition indicated that males remove 41-87% of previously deposited sperm from the female's storage organs during the first 5 min of the copulation. Ejaculation takes place during the remaining 10-15 min. The authors maintain that indirect estimates of precedence in libellulids, based on sperm volume changes, always underestimate reality because of the supplementing effect of a "first-in, last out" mechanism. Because males are skilled at achieving sperm precedence, they are forced to be good guards as well, since a risk of take--overs exists. Females are believed to benefit from contact guarding because it results in a lowered risk of male harassment and predation as well as a lower energy expenditure during oviposition.

(6502) MILLER, P., 1988. Visa extension at Madurai. *Oxford Magazin* 1988 (2nd Week, Michaelmas Term): 6-7, 9. — (Dept zool., Univ. Oxford, South Parks Rd, Oxford, OX1 3PS, UK).
Impressions from a 4-months sabbatic stay at Madurai, Tamil Nadu, India (winter 1987/88), where the author was engaged in odon. behaviour research.

(6503) NOMAKUCHI, S., 1988. Factors affecting the coexistence of two male forms in a population of damselfly Mnais pruinosa Selys (Zygoptera: Calopterygidae). *Proc. XVIIIth Int. Congr. Ent., Vancouver*, p. 208. [Abstract only]. — (Dept Biol., Kyushu Univ., Hakozaki, Higashi-ku, Fukuoka, 812, JA).
2 male froms (f. esakii and f. strigata) occurred in a stream in Kyushu, Japan. Territorial behaviour was initiated only by the ♂ of esakii, and usually this led to displacement of the strigata ♂. The esakii ♂ copulated with ♀ which appeared in the territory and guarded

ovipositing ♀ after copulation. The strigata ♂ also copulated with ♀ perched on the branch of a tree but did not guard them. The copulation frequency of strigata ♂ was not different from that of esakii ♂. Field observations provided evidence that oviposition of ♀ guarded by esakii ♂ was observed twice as often as oviposition of ♀ by themselves, because ♀ remated with esakii ♂ after mating with strigata ♂. It seems that the reproductive success of strigata ♂ is diminished by sperm competition. The density of esakii ♂ was about twice that of strigata ♂ in the study area. However, in another study area at the Muromi river, where 2 forms of ♂ also coexisted, the number of ♀ ovipositing single was higher than that of ♀ guarded by esakii ♂ because of the high number of oviposition sites and the environmental hazard for the establishment of esakii ♂ territory. In this area the density of strigata males was higher than that of esakii males. The factors influencing reproductive success in the two forms of males are discussed.

(6504) OHNESORGE, D., 1988. Die Libellenfauna (Odonata) der Kiesgrube Barkholz (Kreis Stormarn, Schleswig-Holstein). *Seevögel* 9(2): 17-25. (With Engl. s.). — (Reeshoop 19, D--2070 Ahrensburg, FRG).
The odon. fauna (23 spp.) of the gravel pit Barkholz, Co. Stormarn, Schleswig-Holstein, FRG is analysed in detail. 13 spp. have stable populations there, and another 5 of the recorded spp. are likely to be autochthonous.

(6505) [PAVLOVEC, R.], 1988. Ekslibrisi s kačjimi pastirji. — [Dragonfly book plates]. *Obvest. Druš t. Exlibris Slovenia* 97: 2. (Slovene). — (Trubarjeva 14, YU-61000 Ljubljana).
Upon having noticed B. Kiauta's note on this subject in *Selysia* 17(2): 11 (1988; cf. *OA* 6522), the Editor of the newsletter of the "Exlibris Sloveniae" society, in support of Kiauta's request, published a similar appeal. Out of close to 70 Ex Libris societies in the world, this is one of the largest and most active. — (For a paper on C.H. Kennedy's dragonfly book plates, by the same author, cf. *OA* 1919).

(6506) PECK, S.B., 1988. A review of the cave fauna of Canada, and the composition and ecology of the invertebrate fauna of caves and mines in Ontario. *Can. J. Zool.* 66(5): 1197-1213. (With Fr. s.).— (Dept Biol., Carleton Univ., Ottawa, Ont. K1S 5B6, CA).
Caves and cave-inhabiting fauna of Canada are reviewed. The only dragonfly record listed is an Aeshna sp. larva, from Museum Cave 1, on Lake Huron, Ontario. — (Some older references on the odon. records from caves are listed in *OA* 357; — cf. also *OA* 2755, 2859, 2866).

(6507) POIRIER, D.G. & G.A. SURGEONER, 1988. Evaluation of a field bioassay technique to predict the impact of aerial applications of forestry insecticides on stream invertebrates. *Can. Ent.* 120(7): 627-637. (With Fr. s.). — (Dept Environ. Biol., Univ. Guelph, Guelph, Ont. N1G 2W1, CA).
Field biossays were used to assess the toxicities of four formulated insecticides to representative stream invertebrates. Toxicities (48-h LC_{50}) after a 1-h application period ranged from 2.0 to 7.1 µg/l for permethrin, 82 to 284 µg/l for fenitrothion, 344 to 1276 µg/l for aminocarb, and 251 to 1504 µg/l for mexacarbate. Invertebrates drifted at concentrations of permethrin greater than 0.5 µg/l, and at concentrations of fenitrothion, aminocarb, and mexacarbate greater than 10 µg/l. An aerial application of 280 g AI/ha fenitrothion with no stream buffer was made to compare biossay results with impact to aquatic invertebrates under operational spray programs. Concentrations of fenitrothion peaked 30 min after spray at 31.0 µg/l and declined to less than 1.0 µg/l within 14 h. Numbers of drifting invertebrates increased 20--fold 3 h after spray and declined to before-spray numbers within 24 h. Moritalities of caged invertebrates in the stream ranged from 0% for Pycnopsyche sp. to 16% Simulium venustum. In Ophiogomphus sp. the mortality amounted to 1%. The field bioassay accurately predicted the impacts of fenitrothion on stream invertebrates in this situation.

(6508) *PROGRAMM UND ABSTRAKTS der 9. Jahrestagung "Gesellschaft deutschsprachiger*

Odonatologen" 26./27. März, Hamburg 1988. 36 pp. — (Unfortunately, the whole edition was slightly damaged by the binder; — copies are available at Hfl. 20.- net from the SIO Central Office, P.O. Box 256, NL-3720 AG Bilthoven).

Hoffmann, J., T. Krentz, W. Piper & K. Soeffing: Danksagung (p. 1); — Verzeichnis und Adressen der Teilnehmer (pp. 3-8; ca. 100 participants, mainly from FRG and GDR, some from Belgium, the Netherlands and Switzerland); — Tagungsprogramm (9-10); — Abstracts: *Müller, J.:* Zum Vorkommen von Somatochlora alpestris und S. arctica in den Mittelgebirgen der DDR (12); — *Lempert, J.:* Untersuchungen zur Fauna und Ökologie von Libellen (Odonata) des tropischen Regenwaldes von Liberia, Westafrika (13); — *Glitz, D.:* Stand der Libellenkartierung und Schutzmassnahmen in Hamburg (13); — *Jödicke, R.:* Neue Aspekte der Präsenz von Erythromma viridulum an seiner nordwestlichen Arealgrenze (14); — *Clausnitzer H.J.:* Zum Vorkommen des Kleinen Blaupfeils (Orthetrum coerulescens) in einem Heidemoor (15); — *Wendler, A.:* Libellenflügel als taxonomisches Mittel (16); — *Soeffing, K.:* Das Vorkommen von Mykobakterien in Mooren und ihre Bedeutung bei der Ernährung von Libellenlarven (17); — *Schmidt, E.:* Zur Besiedlung von eutrophierten Libellenteichen in den ersten beiden Sommern (18); — *Wegmüller, R.:* Zur Situation geschützter Feuchtgebiete im Berner Seeland aus der Sicht der Libellen (19); — *Peters, G.:* Das Problem des instabilen Geschlechterverhältnisses bei Aeshnidenlarven (20); — *Schmidt, E.:* Felddiagnose, Suchtstrategien und Ökoethologie von Zygopteren der schwer zugänglichen Schwimm- und Tauchblattzone von Seen (21); — *Carius, W.:* Verwandschaftsanalysen bei einheimischen Arten der Gattung Sympetrum (22); — *Lenz, K.:* Welche Faktoren bestimmen Diversität und Populationsgrössen von Libellen an Kleingewässern? (23); — *Krüner, U.:* Die Schlupfrate der Späten Adonislibelle, Ceriagrion tenellum an einem Heidegewässer im Naturpark Schwalm-Nette (24); — *Brockhaus, T.:* Erste Ergebnisse von Odonatenbestandsaufnahmen in Hochmooren des Erzgebirges (24); — *Zimmermann, W.:* Zur Verbreitung und Ökologie der Helmazurjungfer in der DDR (25); — *Soeffing, K.:* Freiland- und Laboruntersuchungen an den Moorlibellen Leucorrhinia dubia und Leucorrhinia rubicunda (26); — *Kappes, W. & G. Ihssen:* Fotographische Artbelege von Anisopteren aus Florida/USA und ihre nachträgliche Bestimmung (27); — *Beck, P.:* Libellenatlas Nordbayern — Stand der Bearbeitung (27); — *Unruh, M.:* Vergleichende Betrachtungen zur Libellenfauna ausgewählter Abgrabungsgebiete des Zeitzer Gebietes, Bez. Halle, DDR (28); — *Beck, P. & S. Beyer:* (Wieder-)Besiedlung geräumter Entwässerungsgräben durch Libellen (29); — *Klugkist, H.:* Zut Unterscheidung der Exuvien von Brauner und Grüner Mosaïkjungfer, Aeshna grandis (L.) und Aeshna viridis Eversm. (Anisoptera: Aeshnidae) (30); — *Buchwald, R.:* Zur Verbreitung und Ökologie von Cordulegaster bidentatus Sélys, 1843 (Cordulegasteridae, Odonata) in Südwest-Deutschland (31-32).

(6509) RAYOR, L.S., 1988. Pseudostigmatid dragonfly predation on spider prey: foraging habits and prey "risk assessment". *Proc. XVIIIth Int. Congr. Ent., Vancouver,* p. 217. [Abstract only]. — (Dept Biol. Sci., Univ. Cincinnati, Cincinnati, Ohio 45221, USA).

[Verbatim]: Field study of the neotropical Mecistogaster modestus in the rainforest of Costa Rica demonstrates that it preys exclusively on small, web-building spiders. The damselfly forages only in direct sunlight: either in persistent sunflecks or in gaps in the canopy. The major prey spp. build tangled, but non-sticky or sticky, but planar webs from which the resident spider can be plucked by the hovering damselfly with minimal risk to the damselfly of contacting sticky silk. Once a web has been located the damselfly returns repeatedly to attack the spider. — In 124 observed predation attempts M. modestus captured 63% of the spiders attacked. One spider sp., Modisimus sp. C (Pholcidae), received 55% of the attacks, yet it avoided capture at a much higher frequency than that shown by the other spider spp. attacked. Evidence indicates that pholcids surviving damselfly attacks may assess their

future risks of predation.

(6510) RESH, V.H., 1988. Publication patterns in entomology: an example based on aquatic insects. *Bull. ent. Soc. Am.* 34(3): 145-150. — (Dept Ent. Sci., Univ. California, Berkeley, CA 94720, USA).
A Biosis Previews literature search was made for citations published between 1981-1985 on 5 groups of aquatic insects (Odon., Ephem., Plecopt., Trichopt., Chironomidae). Number of citations for each group ranged from 406 (Plecopt.) to 887 (Odon.), and these appeared in 148-300 different journals. 19-32 journals (8.3-14.9% of journals containing citations to a group) produced 50% of a group's citations. However, 55.0-64.3% of journals contained only a single citation. Core lists (i.e. those journals containing $\geqslant$ 1% of total citations) were most similar for Trich. and Ephem., Odon. differed most from the others. The Odon. had the most citations and the largest number of serials containing citations to that group. The Odon. also had the lowest percentage of total serials that produced 50% of the citations. This concentration of papers in a relativelly small proportion of serials is explained by the high percentage of total Odon. papers in only 2 journals, *Odonatologica* and *Notul. odonatol.* (for a total of 29.6% of all Odon. papers). Ironically, the Odon.also had the highest percentage of total serials containing only a single citation. The latter phenomenon probably results from the great variety of types of research done with Odon. compared with that of the other aquatic groups. While about one-half of citations for Ephem., Plecopt. and Chrironomidae were taxonomic studies, almost one-quarter of Odon. citations were faunal lists and distributional records. Out of 48 journals considered in the core list of the serials, only 7 had more than 10 Odon. citations during 1981-1985, viz. *Odonatologica* (161), *Notul. odonatol.* (98), *Ent. Nachr.* (19), *Ent. Ber. Amst.* (12), *Revue fr. Ent.* (12), *Am. Midl. Nat.* (11), and *Hydrobiologia* (11). 8 journals contained no citations, and 9 had a single citation. It is suggested that, obviously, bibliographic scattering can be reduced by publishing (taxonomic articles) in the above mentioned journals. A combination of computer searches and perusal of core journals is considered the best approach for maintaining literature awareness.

(6511) RETTIG, K., 1988. Neues aus der Insektenwelt Ostfrieslands. *Beitr. Vogel- Insektenwelt Ostfrieslands* 32: 10-13. — (Danziger Str. 11, D-2970 Emden, FRG).
With reference to the earlier papers in this series (cf. *OA* 6404), 11 odon. spp. are listed, and the dates of the earliest and latest sightings of the adults are stated. April 16 (1982) represents the earliest East Frisian record of Leucorrhinia rubicunda. (For the massive occurrence of this sp. in East Friesland, FRG cf. *OA* 6531).

(6512) RETTIG, K., 1988. Urlaubsbeobachtungen im Herbst 1988 in der Camargue und den Pyrenäen. *Beitr. Vogel- Insektenwelt Ostfrieslands* 32: 14-19. — (Danziger Str. 11, D-2970 Emden, FRG).
5 odon. spp. are recorded from Camargue, France, Sept. 26-28, 1988.

(6513) ROBERTSON, R.M. & R.M. OLBERG, 1988. A comparison of the activity of flight interneurons in locusts, crickets, dragonflies and mayflies. *Experientia* 44(9): 735-738. — (Dept Biol., McGill Univ., 1205 Av. Dr-Penfield, Montreal, Que. H3A 1B1, CA).
The activity patterns of interneurones in the flight system of dragonflies and mayflies were investigated using standard intracellular recording and staining techniques, and were compared with those of crickets and locusts. The results show several basic similarities in the operation of a central motor pattern generator for flight in all four groups of insects. These similarities can be explained as resulting from conservative evolution of flight pattern generating circuitry within the central nervous system.

(6514) RYAZANOVA, G.I., 1988. Factors responsible for the spatial structure of a community of pre-imaginal forms of a predator, as exemplified by the Transcarpathian populations of the larvae of Calopteryx splendens

(Harris) (Odonata). *Kurzfass. Vortr. XII. Int. Symp. Entomofaunistik Mitteleuropa,* Kiev, p. 139. — (Dept Ent., Fac. Biol., Lomonosov St. Univ., Moscov V-234, USSR).
The spatial structure of a population of C. splendens is conditioned by the regularities governing the relationships between conspecific individuals and their spatial behaviour, i.e. the choice of place and the movement pattern. The larval behaviour, as shown in the present studies, is a function of endogeneous factors. Despite the absence of complex relationships associated with the reproduction, it is very diversified. Laboratory experiments revealed a considerable role of age, sex, and the physiological condition of the larvae. — Age determines the location, mobility and the aggregation of individuals. In the presence of older instars, young larvae move little, arrange themselves in groups, and (as shown for stressful situations) occupy spots located higher up from the bottom. This results in a spatial differentiation of the population into age classes. — The sex of larvae determines the spatial behaviour of older instars. Some male larvae develop certain features of territorial behaviour (spatial isolation, aggressiveness, differentiation of interactions with conspecific individuals, which is conditioned by the status of the latter). — The differences in the physiological condition of individuals are defined by the degree of the gonad development, and appear to be the basis of the manifestation of complex interrelations among the older instars. — (Cf. also *OA* 5283, 6406).

(6515) RYAZANOVA, G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1988. Prostranstvennye vzaimootnosheniya raznovozrastnyh lichinok strekozy Calopteryx splendens (Harris) (Odonata, Zygoptera). — Spatial interrelation in diverse ages of the damselfly larvae Calopteryx splendens (Harris) (Odonata, Zygoptera). *Vest. mosk. Univ.* (Biol.) 1988(2): 39-42. (Russ., with Engl. s.). — (Dept Ent., Fac. Biol., Lomonosov St. Univ., Moscow V-234, USSR).
Some features of the spatial behaviour, relative to sex and age, were examined in an aquarium. The aggregation effect was mainly noted in the young instars of both sexes. Solitude is mainly restricted to males of the ultimate and penultimate instars. The relationship between larval and adult spatial distributions is hypothesized.

(6516) SANTOS, N.D., J.M. COSTA & J.R. PUJOL-LUZ, 1988. Nota sobre a ocorrência de odonatos em tanques de piscicultura e o problema da predaçao de alevinos pelas larvas. *Acta limnol. brasil.* 11: 771-780. (Port., with Engl. s.). — (Depto Ent., Museu Nacional, Quinta da Boa Vista, BR-20.942 Rio de Janeiro, RJ).
Some information is given on odon. spp. encountered as predators of fish fry in Brazil, and some suggestions are offered to tackle this problem in fishponds.

(6517) SAVILLE, N., P. NORTHCOTT, T. TUFTON & N. JONES, 1988. *The Cambridge Entomological Expedition to Nepal 1988.* Gonville & Caius Coll., Cambridge, UK. 4 pp. — (Second Author: Gonville & Caius Coll., Univ. Cambridge, Cambridge, CB2 1TA, UK).
The 4 authors, graduates from Cambridge Univ., are the sole expedition members. In the present pamphlet, the scientific objectives, itinerary, budget (£ 5680.-) and funding are briefly outlined. The Patron was Prof. Sir Vincent B. Wigglesworth, the expedition was to stay afield from mid Sept. to mid Dec. (Shivapuri and the Everest region), its main objectives were dragonfly and bumblebee research, with emphasis on Epiophlebia laidlawi.

(6518) SCHMIDT, E., 1988. Biotopbewertung durch "Repräsentative Spektren der Odonatenarten". *Kurzfass. Vortr. XII. Int. Symp. Entomofaunistik Mitteleuropa,* Kiev, p. 190. — (Biol. Didaktik, PF, Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG).
[For the original publication cf. *Odonatologica* 14(1985): 127-133].

(6519) SCHMIDT, E., 1988. Zur Systematik, Ökologie und Biogeographie mitteleuropäischer Odonaten am Beispiel der Gomphiden. *Kurzfass. Vortr. XII. Int. Symp. Entomofau-*

nistik Mitteleuropa, Kiev, p. 189. — (Biol. Didaktik, PF, Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG).
A brief statement is made on the classification of the European Gomphidae, with reference to the plesiomorphic and synapomorphic features in the adults and larvae. The biogeographic distribution in Central Europe is subject to climatological conditions and habitat preferences. Almost all spp. in this region are threatened by pollution and by human impact on habitat structure.

(6520) SCHORR, M., 1988. *Grundlagen zu einem Artenhilfsprogramm Libellen (Insecta: Odonata) der Bundesrepublik Deutschland.* II+359 pp. Diplomarbeit, Institut für Landschaftspflege & Naturschutz, Univ. Hannover. — Available, at DM 50.-, from the Author. — (Quinter Str. 112a, D-5500 Trier-Ehrang, FRG).
The Author's objective was a compilation of the published information on the Odon. of Central Europe, the evaluation of the available evidence from the conservancy point of view, and the development of the thereon based tentative suggestions relative to odon. conservation. The result is a comprehensive monograph on the ecology of the regional fauna (80 spp.), with emphasis on Germany and Switzerland, and considering over 600 primary publications, published up to March, 1988. For a M. Sc. thesis, the scope, the approach, great thoroughness and the author's skill in dealing with the literature are remarkable. The book is virtually a reference work on the subject, containing incomparably more, more detailed, better organised and better documented information than any of the numerous, odonatological works that are currently available on the market. A concise, monographic, species-wise treatment of all aspects of ecology is followed by a likewise precise and well-documented analysis of the conservancy status, augmented with well-defined management suggestions for each sp. By evidencing (and often critically discussing) the scattered literature data and therewith pointing to numerous lacunae in our knowledge, the work will certainly trigger and stimulate well-defined further research, while the presented information relative to e.g. habitats, autecology, biogeography, regional distribution, etc. will facilitate conservationists' efforts on all levels. Last but not least: this is the first work presenting detailed distribution maps of all spp. in the FRG. — (*Abstracter's Note:* According to the information received from the Author, a commercial publication of this monograph is under consideration).

(6521) SCHWIEGER, F., 1988. *Strömungssichtbarmachung am Libellenflügel - Methoden und erste Ergebnisse.* Diplomarbeit Univ. Braunschweig. VIII+108 pp. — (Author: Wabestr. 2, D-3300 Braunschweig, FRG).
The flow around models of single wings and ipsilateral wing pairs of Calopteryx splendens was studied in a wind tunnel. In enlarged models the natural pleating of the wing surface was reproduced, and experiments were set at Reynolds numbers according to Calopteryx flight. The models were arranged in the air stream at various realistic positions. Using wing pairs, an advantageous effect on the flow around each single wing could be shown under steady flow conditions which, however, apply only to gliding. Lift is enforced, and flow separation occurs only at extreme angles of attack. To study the more realistic conditions of unsteady flow around beating wings an apparatus was constructed by which a wing pair model could be moved through a three-dimensional path similar to that of the beating wings in C. splendens. Even pronation and supination at the upper and lower ends of the wing tip path were performed by the machine. The flow and the resulting vortices at various positions during the wing stroke are described. Again an advantageous effect could be observed in each wing of a beating wing pair model, compared with the conditions at single wing models. Photographs of all flow conditions were shot by illuminating smoke particles in the streamlines using laser light flashes.

(6522) *SELYSIA.* Newsletter of the Societas Internationalis Odonatologica and the U.S. National Office, Vol. 17, Nov. 2 (Sept. 1, 1988). — (c/o D.M. Johnson, Dept Biol. Sci., East Ten-

nessee St. Univ., Box 23590 A, Johnson City, TN 37614-0002, USA).
The technical "make-up" of the newsletter is continuously improving; this is the first issue containing a few figs. — Contents: *Tennessen, K.J.:* Clubtails on the Flambeau (p. 9); — *Garrison, R.W.:* Dragonfly envelopes (9); — *Provonsha A.:* Argia vivida specimens from Idaho & Montana needed (9); — *Van Brink, J.M.:* News from the Treasurer (10; henceforth all payments to the S.I.O. can also be made by VISA credit cards); — *Johnson, D.M.:* X International Symposium of Odonatology (10; a General Information leaflet also goes with this issue; Registration, Abstract and Housing Reservation Forms are available from the Editor of *Selysia*, at the above address. The deadline for the receipt of these is 15 March 1989; applications for travel grants must be received, at the same address, by 15 December 1988); — *Saville, N.:* The Cambridge Entomological Expedition to Nepal 1988 (10); — *Convention on the Conservation of European Wildlife and Natural Habitats:* List of animal species added to the Appendices to the Bern Convention, Odonata (10); — *Kiauta, B.:* The First Symposium of Swiss odonatologists and charter meeting of the Swiss Society of Odonatology (11); — Dragonfly book plates ("ex libris"), a request (11); — *Devai, G.:* On the formation of the Fraternity of Hungarian Odonatologists, its organizational structure, operational conditions and objectives (12-13); — *Pritchard, G.:* S.I.O. membership of committees, 1988--1989 (14); — *Johnson, D.M.:* Dragonfly stamps (14); — From the Editor's desk (14; "Who reads *Selysia?*", "Recent deaths". "Mahato moves to America").

(6523) *SIEEC.* 1988. *XII Mezhdunarodnyy Simpozium po entomofaune Sredney Evropy. - XII. Internationales Symposium für die Entomofaunistik Mitteleuropas. - XII International Symposium on Entomofaunistics, Central Europe,* Kiev 25th to 30th September 1988. *Programma-Programm-Programme.* 54 pp. — and *Tezisy dokladov. - Kurzfassungen der Vorträge.* 196 pp. Acad. Sci. Ukrain. SSR & Ukrain. Ent. Soc., Kiev. (Titles as stated, papers in Russ., Germ. & Engl.). — Price (Tezisy dokladov [= Abstracts of Papers] only): Rub. 2.- in the USSR.
The main objective of the biennial, multidisciplinary SIEEC apparently is the bringing together of some of the workers and to facilitate their mutual contacts. For this reason it is unfortunate that a directory of the participants has not been published, nor do the addresses of the authors appear in these 2 publications. The scope of a research area like the "insect faunistics in Central Europe" is of course too broad to serve as a common "denominator" for an international meeting. It is a matter of (highly appreciated) expedience, therefore, that for the first time now the Organizing Committee have assigned a special session to odonatology. It was chaired by Prof. Dr. Eb. Schmidt (Bonn, FRG) and Dr. Z.D. Spuris (Salaspils, Latvia), and contained 6 papers, by H. Donath, Eb. Schmidt, Z. Spuris, A.P. Stanionyte and W. Zessin, leaving only the paper by G.I. Ryazanova for presentation in a different session. (The abstract of Donath has not been published, the others are listed in *OA* 6514, 6519, 6524, 6525, 6535). Since oral presentation facilititates and triggers the discussion, the circumstance that much of the information in most of the papers has been published by the authors elsewhere earlier is not considered a disadvantage. On the other hand, it is regrettable that the Organisers did not feel compelled by the General Recommendation E/23 of the International Code of Zoological Nomenclature, stipulating that "A zoologist should not publish a name for the first time in an abstract, ...in advance of the work... that contains the description of the new taxon in question". Consequently, in the paper of Zessin, 2 genus-group and 2 species--group nomina nuda are introduced. — (*Abstracter's Notes:* The S.I.O. was represented by Prof. Dr. J.M. van Brink. — As far as published, only some of the material of the previous symposia is available to the Abstracter. On the basis of the present 2 publications, the following queries rise: (1) The name of the Symposia is apparently not standardized in different national languages. The Russian and German versions are given in both publications, but the latter in 2 different

modifications: "...für die Entomofaunistik Mitteleuropas", resp. "...über Entomofaunistik in Mitteleuropa". The English version is given inside (but not on the cover) of the Program only, and the translation appers somewhat "arbitrary". — (2) Of the usual "congress languages", only Russian, German and English, in this sequence, are recognized (Program p. 30). — (3) The geographic scope of "central Europe" is not clear. Judging from the countries of residence of the Standing Committee members, this would embrace FRG, GDR, Yugoslavia, Austria, Poland, Romania, Switzerland, USSR, Czechoslovakia and Hungary. Papers in the present volume are dealing also with e.g. Bulgaria, Georgia, southern taiga (in Siberia?) etc. Since French and Italian apparently are no recognized SIEEC languages, one has the impression that the geographic position and faunal character of e.g. eastern France, Luxembourg, southern Belgium and parts of northern Italy are disregarded. — (4) If the figure (200) of the copies of the Program printed reflects the approximate number of the participants expected, it would seem opportune to assign some more time to discussions of the papers, economizing by rejecting those that deal neither with the formal geographic area, nor with faunistics. — (5) The Standing Committee apparently have no influence on publication, meaning that the Symposium documents (incl. the Abstracts and the Proceedings volumes) are published and distributed at the organizer's discretion, thus a regular library subscription to either of these is technically impossible, hence the circulation is incidental. — (6) Last but not least, modern trends in international entomological (and other scientific) meetings do not favour multidisciplinary gatherings. The SIEEC are certainly useful, but more "professionalization" and standardization in the organisation would certainly extend their "longevity".

(6524) SPURIS, Z., 1988. Erforschungszustand der Odonatenfauna in der Westzone des europäischen Teiles der USSR. *Kurzfass. Vortr. XII. Int. Symp. Entomofaunisitk Mitteleuropas,* Kiev, p. 154. — (Hortus botanicus, Latvian Acad. Sci., Miera iela 19-6, USSR-229021 Salaspils, Latvian SSR).

The regions considered are Estland (53 spp.), Latvia (53 spp.), Lithuania (54 spp.), Byelorussia (53 spp.), the Kaliningrad area (little explored, last publication in 1911, status not stated), western Ukrainia (65 spp.) and Moldavia (20 spp.). In all, 71 spp. are so far known from this region. Save for Kaliningrad and Moldavia, the fauna is considered adequately explored, but a new survey and mapping are advocated with reference to the forthcoming monitoring.

(6525) STANIONYTE, A.P., 1988. Dragonflies (Odonata) and their distribution in the protected territories of the Lithuanian SSR. *Kurzfass. Vortr. XII. Int. Symp. Entomofaunistik Mitteleuropas.* Kiev, p. 156. — (Inst. Zool. & Parasitol., Mokslu Akad., MTP-1, Lenino pr. 3, USSR-232021 Vilnius, Lithuanian SSR).
[For the full paper cf. *OA* 6414].

(6526) TANABE, T., 1988. On the way of making an insect specimen by vacuum drying. *Nature & Insects* 23(11): 10-14. (Jap., with Engl. title). — (Author's address not available).
The equipment and the techniques are described (and figured) with special reference to the Odon. — *Abstracter's Note:* The attractive Japanese desiccator accommodates 2 setting boards, for 2 larger anisopterans each, hence it may be too small for professional needs. There are no bibliographic references, and no credit is given to workers who have discovered and developed this method in insects in general, and in Odon. in particular. The room-temperature vaccum drying of insects, with special reference to dragonflies, has been first described in great detail by B.P. Moore [1951, *Proc. S. Lond. Ent. nat. Hist. Soc.* 1949/1950: 179-186], and developed independently under low temperature conditions by D.A.L. Davies [1954, *Entomologist* 87: 34-36; — 1956, *Nature, Lond.* 177: 657-658]. A good account was published by F.L. Carle [1978, *Odonatologica* 7: 11-13]. The advantage of the present equipment is in the first place in its commercially attractive appearance).

(6527) UBUKATA, H., 1988. Reproductive competition and the male dimorphism in the dam-

selfly Mnais costalis Selys (Odonata: Calopterygidae). *Proc. XVIIIth Int. Congr. Ent. Vancouver,* p. 208. [Abstract only]. — (Dept Sci. Educ., Kushiro Coll., Hokkaido Univ. Educ., Kushiro, 085, JA).
[Verbatim]: The Japanese Mnais is composed of 3 closely related spp. (costalis Sel., pruinosa Sel. s. str., and nawai Yamamoto). Males of M. costalis show an apparent dimorphism, viz. "orange-winged form" (OW) and "hyaline--winged form" (HW), as in the other two species. All females are hyaline winged. OW males have stouter and much more pruinose bodies and a higher ratio of wing length to abdominal length than have HW males. — Mature OW males occupy territories on a stream and guard their ovipositing mates after copulation. On the other hand, HW males are far less aggressive than OW males and show no tendency to occupy territories unless OW males have been removed. HW males obtain mates by sneaking into the territories of OW males, by intercepting females visiting territories, or by searching along a stream. — The mating system of M. costalis can be regarded as a coexistence of 2 different mating strategies closely connected to male dimorphism. The morphology of OW males must have been favoured by natural/sexual selection to maintain territories and to attract females, while that of HW males is favourable for sneaking. The ratio of the 2 forms is affected by their degree of visibility on a stream.

(6528) VAIDYA, K., A.P. GORKHALI, S. KHANAL & T.M. PRADHANANGA, 1988. Water pollution in the Bagmati river of the Pashupati Development Area. *Proc. Sem. Environ. Pashupati Area, Kathmandu,* pp. 158-180 (Nepali pagination). — (First Author: Central Dept Zool., Tribhuvan Univ., Kirtipur, Kathmandu, Nepal).
The paper contains a list of the invertebrate genera and families recovered from samplings at 6 moderately polluted localities in the Bagmati R., Kathmandu Valley, Nepal (Sept., Oct., 1987). The gomphids appear rather common (4 localities), but are listed here under the New World genera Octogomphus and Progomphus. — (*Abstracter's Note:* Paragomphus lineatus is very common on the Bagmati R.; Anisogomphus occipitalis is the more common of the other 3 of 4 gomphid spp. that occur there).

(6529) VARIS, V., 1988. P.L. Miller, 1987; Dragonflies. *Annls ent. fenn.* 54(4): 162. (Engl.). — (Zool. Mus., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki).
Book review of the volume listed in *OA* 6031.

(6530) *WALKERIA.* Newsletter of the Canadian National Office of the International Odonatological Society, Vol. 3, No. 2 (Dec. 1, 1988). — (c/o Dr. S. Cannings, Dept Zool., Univ. British Columbia, 6270 University Blvd, Vancouver, B.C., V6T 2A9, CA).
Pratt, P.: Hunt for the black dragon (p. 5); — *Pritchard, G.:* Travels with Gordon, or Memoirs of Madurai (pp. 6-7). — The standard sections, "Canadian odonatology", "Publications available" and "Requests" contain 4 items.

(6531) WESSELS, H., 1988. Ein Massenschlüpfen der Nordischen Moosjungfer. Beobachtungen zum Vorkommen und Habitatsanspruch von Leucorrhinia rubicunda. *Beitr. Vogel- Insektenwelt Ostfrieslands* 32: 5-9. — (Am Tiergarten 25, D-2960 Aurich-1, FRG).
A massive occurrence of L. rubicunda (estimated at at least 500 individuals) is reported from a locality on the Nature Reserve "Ewiges Meer", East Friesland, FRG, May 7 and 14, 1988. By May 23, the adult population considerably decreased, and not a single individual was noticed on June 17. The habitat and behaviour are described, and reference is made to a similar observation from a Sphagnum moor nr Krickmeer, East Friesland, where on May 20, 1985 over 1000 individuals were estimated (*OA* 5163).

(6532) WIGHTON, D.C., 1988. Odonate fossils from the Lower Cretaceous of northeastern Brazil. *Proc. XVIIIth Int. Congr. Ent., Vancouver,* p. 64. [Abstract only] — (Dept Genet., Univ. Alberta, Edmonton, Alberta, T6G, 2E9, CA).
[Verbatim]: 2 new spp. of fossil Anisoptera are reported from the Crato member of the Lower Cretaceous (Aptian) Santana formation of NE Brazil. One sp. (adult) is assigned to the extinct Aeschnidiinae, genus Aeschnidiopsis, and sug-

gests an original Pangaeaian distribution for the subfamily and a north and south polar division during Mesozoic times, isolating the 3 generic populations. The other sp. (larva) is assigned to the Macromiidae, genus Macromia, and represents a very primitive condition, where large antennae may have played the major sensory role in detecting prey. The referred larva is the oldest member of the Macromiidae and the first macromiid from S. America. Other adult fossil zygopterans [were] also presented.

(6533) WOOTTON, R.J., 1988. The historical ecology of aquatic insects: an overview. *Palaeogeography Palaeoclimatology Palaeoecology* 62: 477-492. — (Dept Biol. Sci., Univ. Exeter, Prince of Wales Rd, Exeter, EX4 4PS, UK).
The fossil record of freshwater insects is reviewed. The Protodonata (= superorder Meganisoptera = infraorder Meganeurina of order Odonata), which are distinguished from other odonatoids by their wing venation, are known from the Namurian to the Lias. Their juveniles are almost unknown. It was suggested that they were at most semi-aquatic (cf. *OA* 3276), while a larva figured by Kukalova-Peck (cf. *OA* 4320) suggests a fully aquatic habit. — The Odon. proper (sensu Carpenter, 1960) first appear in the Lower Permian (Artinskian and Kungurian) of the USA and USSR, where they are represented by Zygoptera-like spp. and by small Protanisoptera. Anisozygoptera are first known from the Upper Trias of the USSR and Australia, and Anisoptera from the Lias of Britain and Germany. — The inter-relationships of the subdivisions of Odon. are still controversial, and their interpretation affects the evidence for the age of the aquatic larval. Fossil larvae are unknown before the Trias. Fraser (1957) regarded Protanisoptera as a blind branch, and derived Anisoptera from Anisozygoptera, and the latter from Zygoptera. Carpenter (1931) derived Zygoptera from Lower Permian Protozygoptera, and suggested that Anisozygoptera and Anisoptera might come from Protanisoptera. Pritykina (1980) implies that the Zygoptera and Anisoptera lineages may have been separate since the Carboniferous. — The forms resembling Zygoptera have been diversifying since the Lower Permian, and Anisozygoptera were prominent during Late Trias-Early Cretaceous, but declined with the expansion of the Anisoptera from the Lias onwards.

(6534) ZAHN, A., 1988. [Book review]. H. Bellmann: Libellen beobachten-bestimmen. *Ökowerk Mag.* 2(5): 20.
Bock review of the work listed in *OA* 6111.

(6535) ZESSIN, W., 1988. Neue Libellenfunde (Odonata) im Oberen Lias Mitteleuropas. *Kurzfass. Vortr. XII. Int. symp. Entomofaunistik Mitteleuropas*, Kiev, p. 184. — (Thälmann Str. 30, DDR-2754 Schwerin, GDR).
From the Upper Lias of Grimmen, GDR, 7 spp. are listed, viz 3 in Protomyrmeleontidae (incl. Zirzipanagrion quadriordinis gen. n., sp. n. and Obotritagrion petersi gen. n., sp. n.), 1 in Heterophlebiidae, 1 in Gomphidae and 2 in Anisozygoptera incertae sedis. The new taxa are nomina nuda.

1989

(6536) DE MARMELS, J., 1989. Palaemnema orientalis spec. nov. aus der östlichen Küsten-Kordillere Venezuelas (Odonata: Platystictidae). *Opusc. zool. flumin.* 32: 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 4 ♂ and 2 ♀ (holotype ♂: Venezuela, Sucre, Macuro, 17-VII-1988; deposited at I.Z.A., U.C.V., Maracay). It is closely related to P. melanostigma Hagen in Selys from which it differs in colour pattern of thorax and in shape of superior tooth of superior anal appendages. This sp. and Megapodagrion lepidum Racenis are endemic to the Venezuelan eastern Coastal Cordillera and might be under threat due to severe deforestation, forest fire and the construction of water reservoirs in the mountains. — (*Abstracter's Note:* In the same series, descriptions of new odon. taxa were published in papers listed in *OA* 5246, 6064, 6372; other

odon. papers are listed in *OA* 4572, 5316, 5774, 5862, 5874, 5999, 6177, 6289, 6393, 6466, 6540. Single papers can be ordered from, and subscriptions to the odon. titles or to the whole series sent to: "Casa d'Uors", Postfach 324, CH-8896 Flumserberg-Grossberg, Switzerland).

(6537) KRÜNER, U., 1989. Die Libellen (Odonata) im deutschen Meinweg. *Heimatskalender Kreis. Heinsberg* 1989: 173-180, 1 col. pl. excl. — (Gelderner Str. 39, D-4050 Mönchengladbach-4, FRG).
The odon. fauna (26 spp.) inhabiting the heaths and moors of the German part of the Meinweg (in the German-Dutch border area) is described and discussed. Lestes dryas, L. virens and Leucorrhinia pectoralis are among the 8 threatened spp.

(6538) MEIER, C., 1989. Die Libellen der Kantone Zürich und Schaffhausen. *Neujahrsbl. naturf. Ges. Schaffhausen* 41: 124 pp, 12 col. pls incl. — (Gibel Bannholz, Postfach 252, CH-8636 Wald). — Available from the SIO.
This is not a regional faunistic monograph in the classical sense, but rather a "monographic analysis" of the ecological propensities and the status development (since 1885) of each of the 68 species recorded from the Swiss cantons of Zürich and Schaffhausen. With his collaborators, the author has examined in the field, or screened from the literature records, the fauna of over 700 biotopes, and a computer program was developed for the treatment of the data. In its approach, the book is largely a pioneer work in odonatological literature; its principal aim is to serve as a reliable instrument in dragonfly conservation. The theoretical considerations on the role of dragonflies in the general concept of nature conservation are of universal applicability. The careful characterisation of the faunal composition of various types of habitats is applicable in most parts of Europe. The charm of the easily legible book is enhanced by colour portraits of 51 species, contributed by a number of well known Swiss dragonfly photographers.

(6539) VAN TOL., 1989. [Boekbespreking]. Askew, R., 1988. The dragonflies of Europe. *Ent. Ber., Amst.* 49(1): 19. (Dutch). — (Rijksmus. Nat. Hist., P.O. Box 9517, NL-2300 RA Leiden).
Book review of the volume listed in *OA* 6357.

(6540) VERHANDLUNGEN DES I. SYMPOSIUMS SCHWEIZERISCHER ODONATOLOGEN. — PROCEEDINGS OF THE 1st SYMPOSIUM OF SWISS ODONATOLOGISTS. *Opus. zool. flumin.* 34: 1-32. (With Engl. titles). — The booklet is available, at sFr. 17.— net, from "Casa d'Uors", Postfach 324, CH-8896 Flumserberg-Grossberg, Switzerland).
There are extensive "abstracts" of papers presented at the Symposium, edited by C. Meier (Postfach 252, CH-8636 Wald). A newspaper note on the Symposium was published in *Neue Zürcher Zeitung* (cf. *OA* 6381), and a brief technical report appeared in *Selysia* (cf *OA* 6522). — Contents: Meier, C.: Einleitung (p. 2); — *Buchwald, R.:* Zur Ökologie von Coenagrion mercuriale (Charp.) und Orthetrum coerulescens (Fabr.) in Südwestdeutschland (Odonata: Coenagrionidae, Libellulidae) (pp. 3-6); — *Hoess, R.:* Variationen von Calopteryx virgo (L.) in der Schweiz (Odonata: Calopterygidae) (pp. 7-9); — *Küry, D.:* Hohe pH-Werte als Folge der Eutrophierung in anthropogenen Naturschutzweihern und ihre Auswirkung auf Libellenpopulationen (Odonata) (pp. 10-14); — *Maibach, A & C. Meier:* L'atlas de distribution des libellules de Suisse (pp. 15-16); — *Müller, R.:* Kurze Übersicht über die Odonaten der Philippinen und ihre Lebensräume (pp. 17-18); — *Schwaller, T. & K. Eigenheer:* Die Libellenfauna im Bezirk Wasseramt, Kanton Solothurn, Schweiz (Odonata) (pp. 19-20); — *Sternberg, K.:* Ergebnisse quantitativer Exuvienaufsammlungen in einigen Mooren des südlichen Hochschwarzwaldes, Bundesrepublik Deutschland: eine vorläufige Bewertung (Odonata) (pp. 21-26); — *Wegmüller, R.:* Zur Situation geschützter Feuchtgebiete im Berner Seeland, Schweiz, aus der Sicht der Libellen (Odonata) (pp. 27-29); — *Wildermuth, H.:* Zur Verbreitung und zur Ökologie von Somatochlora arctica (Zett.) und S. alpestris (Sel.) in der Schweiz (Odonata: Corduliidae) (pp. 30-32).