

ODONATOLOGICAL ABSTRACTS

1973

- (3154) CHAPPELL, R.L., A.D. KLINGMAN & M.M. BELL, 1973. Neurophysiology and development of the dragonfly median ocellus. Proc. N.Y. ent. Soc. 81 (1): 63. — (Dept. Biol. Sci., Hunter Coll., City Univ. New York, Room 210, 695 Park Ave, New York, N.Y. 10021, USA).

This is abstract of the programme, "The cyclops eye of the dragon fly", presented at the meeting of the New York Ent. Soc., Feb. 20, 1973. — [Verbatim] The role and development of the dragonfly median ocellus are discussed in light of recent neurophysiological evidence obtained from intracellular recordings of receptors and post-synaptic units and from electron micrographs of synaptic organization. Behaviorally, dragonflies whose ocelli were occluded in the field flew up to a branch and remained there as long as they were observed (one hour) while those whose compound eyes were occluded flew skyward until they disappeared from sight, indicating possible roles in diurnal behavior and phototaxis. On the basis of neurophysiological recordings and feedback synaptic organization, an additional role as a shadow or motion detector was suggested. A study of the development of a population of 32 nymphs of *Aeshna tuberculifera* revealed that while the presumptive lateral and median ocelli could not be identified prior to the fourth day of the final instar, they could always be found after the eighth day of the final instar. The mean duration of the final instar was

30.4 days (standard deviation of 6.6 days) for a population of 245 dragonflies of the species *Aeshna tuberculifera* and *Anax junius*. The preceding instar (instar -1) had a mean duration of 16.8 days (standard deviation of 3.6 days) for a population of 100 dragonflies. For ten dragonflies reared through instar -2, the mean duration of that instar was 15.1 days. Developmental study suggests the possibility of severing the ocellar nerve prior to emergence in order to obtain denervated adult ocelli for neurophysiological study.

- (3155) GANDHI, Y., 1973. Chromosomal studies of five species of Odonata (damsel and dragon flies). M.Sc.thesis, Panjab Univ., Chandigarh. IV+91 pp., figs excl. — (Author's address unknown).

This is a very detailed study of the male gonial chromosome morphology and behaviour, with special reference to the chiasma frequencies in *Ceriagrion coromandelianum* (Delhi and Chandigarh; n=14), *Rhodischnura nursei* (Chandigarh; n=14, m), *Brachythemis contaminata* (Delhi; n=13, m), *Crocothemis servilia* (Chandigarh; 2n=27, n=13, m) and *Trithemis festiva* (Chandigarh; n=13, m). The paper also contains a brief outline of the history of the cytogenetic work on Odon. and a catalogue (incomplete) of the chromosome numbers in the Order is appended.

1974

- (3156) UTZERI, C., 1974. La vita delle libellule. In: I cinque libri delle ricerche, vol. 4 (zool.), pp.

24-26. S.E.D., Viterbo. — (*Ist. Zool., Univ. Roma, Viale dell'Università 32, I-00100 Roma*).

A general account on dragonflies, by a noted Italian odonatologist, directed at junior secondary school students, and including colour photographs of *Coenagrion puella* and *Calopteryx haemorrhoidalis*. — (*Abstracter's Note*. No reprints are available; for xerox copies apply to the Editors of *Odonatologica*).

1975

- (3157) FOSTER, S. & T. GRAVES, 1975. Odonata of North Queensland. *N. Qd Nat.* 43 (166): 4-5. — (*Authors' addresses not stated*).
A list is given of 35 spp., collected on Nov. 10 and Dec. 8, 1974 at resp. Davies Creek and Rocks at Freshwater Creek, Cairns, North Queensland, Australia. (Cf. also *OA* No. 3158).
- (3158) GRAVES, T., 1975. Introduction to Odonata of North Queensland. *N. Qd Nat.* 43 (166): 3. — (*Author's address not stated*).
This is an excerpt from the covering letter sent to the Editors along with the manuscript of the paper listed in *OA* No. 3157), but it is printed in the journal as an independent bibliographic unit. It contains brief field notes on *Pseudocordulia elliptica*, *Orthemis migratum* and *O. villosorittatum*.

1976

- (3159) PATTERSON, J.A. & R.L. CHAPPELL, 1976. Electrical activity and structure of receptor and second-order cells of the median ocellus of the dragonfly. *Biol. Bull. Woods Hole* 151 (2): 423. [Abstract only]. — (*Dept. Zool., St. Bartholomew's Hospital Med. Coll., Charterhouse Sq. London, EC1M 6BQ, UK*).
[Verbatim]: Cells producing a response, described as typical of the second-order ocellar neuron response, have been identified by procion yellow staining via intracellular micropipette recording electrodes. Of those cells successfully filled, two have

been unequivocally identified as representing the same second-order neuron on the basis of gross anatomy, location and patterns of terminal branches in the brain. The latter has been confirmed by comparison with a catalog of the central projections of the seven large neurons in the dragonfly median ocellar nerve obtained using cobalt impregnation of the whole nerve. The identified neurons represent one of three pairs of neurons, a neuron from each pair terminating in one side of the brain. (The seventh large ocellar neuron sends branches into both sides of the brain). The procion study reveals that the identified neuron descends from one lobe of the bilobed median ocellar retina, crossing over in the ocellar nerve to terminate in the contralateral deutocerebrum, an observation difficult from cobalt impregnations alone. — Procion staining of three receptor cells of the dragonfly median ocellus using intracellular electrodes has always revealed the entire receptor axon as well as the reticular region and soma. Receptor axons may be straight or slightly serpentine in their course and show no major branches, but have small swellings along their length. In each case the receptor axons terminate in the synaptic region of the retina and do not send projections into the brain. It may well be that the fairly numerous small axons in the ocellar nerve represent a class of second-order cell which may not be fully characterized electrophysiologically.

- (3160) WHITTEN, R.H., 1976. Color formation in insects, *Carolina Tips, Burlington* 39 (12): 47. — (*Invert. Biol. Dept., Powell Lab., Carolina Biol. Supply Co., Gladstone, Oregon 97027, USA*).
A general article, aiming at sales promotion, in the journal of the Company, and containing a reference to the Tyndall scattering, responsible for the blue colour of dragonflies.

1977

- (3161) DALTONS, S., 1977. The miracle of flight. *Sampson Low, Maidenhead*. 168 pp. —

Price: £ 5.95. — (Publisher: *Berkshire House, Queen Str., Maidenhead, Berks, SL6 1NS, UK*).

The evolution of flight, flight techniques in animals, and the development of aircraft are dealt with in a style understandable to a general reader. A few notes on the flight habits of Odon. are also included, and photographs of *Lestes sponsa* and *Aeshna cyanea* in free flight are shown.

- (3162) ŘÍHA, P., 1977. Terciérní hmyz chebské a sokolovské pánve. [Tertiary insects of the Cheb-Sokolovi basin]. Sbor. 8 celostát. paleontol. Konf. Sokolovo [Natn. Mus. Prague], pp. 19-22. (Czech). — (*Sobeslavská 66, CZ-130 00 Prague-3*).

As far as the insect fauna is concerned, the Miocene Cypris-deposits of Cheb and Sokolov (=Falkenau) are the richest in the Bohemian Massiv, Czechoslovakia. *Libellula doris* was recorded from there earlier (J. Jokély, 1857, Jb. geol. Reichsanst. Wien 8: 466-515), while in the present note the discovery is reported of odon. larvae, tentatively referred to 6 undescribed *Orthetrum* spp. (Cf. also *OA* No. 3093).

1978

- (3163) CHAPPELL, R.L., L.J. GOODMAN & J.B. KIRKHAM, 1978. Lateral ocellar nerve projections in the dragonfly brain. *Cell Tiss. Res.* 190 (1): 99-114. — (*Dept. Biol. Sci., Hunter Coll., City Univ. New York, Room 210, 695 Park Ave, New York, N.Y. 10021, USA*).

The central projections of the lateral ocellar neurons of adult *Aeshna tuberculifera* and *Anax junius* were examined using whole nerve cobalt iontophoresis, supplemented by sectioning of the nerve and brain for inspection in the light and electron microscopes. At E.M. level the presence of cobalt in filled axon profiles and cell bodies was confirmed by analysis of X-ray energy spectra in the microscope. — The pathways, cell body sites and terminal arborizations of four large (7-25 μm diameter) lateral ocellar neurons are described. Two of these fibers

arborize in the ipsilateral posterior neuropil of the protocerebrum and two cross the brain and arborize in the contralateral posterior neuropil. Within each half of the posterior neuropil, two spatially separated regions of ocellar input have been identified. These regions receive median ocellar input plus input from either the ipsi- or contralateral ocellus, but not both. The arborizations of the contralateral fibres are more extensive than those of the ipsilateral fibres.

— One of the contralateral neurons crosses the brain in the region of the protocerebral bridge giving off a collateral in that region before descending to the posterior neuropil. This collateral arborizes almost immediately in a region receiving input from arborizations of a number of small ocellar neurons (those less than 5 μm in diameter) from the ipsilateral ocellar nerve, together with small neurons from the median ocellar nerve, forming a region in each half of the brain which receives input from all three ocelli. The small lateral ocellar neurons associated with these arborizations have cell bodies adjacent to the lateral ocellar tracts (Authors).

- (3164) MATTA, J.F., 1978. An annotated list of the Odonata of south-eastern Virginia. *Va J. Sci.* 29 (3): 180-182. — (*Dept. Biol. Sci., Old Dominion Univ., Norfolk, Virginia 23508, USA*).

61 spp. are recorded from SE Virginia, USA (Counties of Sussex, Southampton and Isle of Wight, cities of Norfolk, Portsmouth, Virginia Beach, Chesapeake and Suffolk). Flight season and habitat preference, where known, are stated for most of them. A curriculum note and a portrait of the author are also provided.

- (3165) PRETSCHER, P. & A. SCHULT, 1978. Die Gefährdung der Insektenfauna, insbesondere der Schmetterlinge, durch Fang und Handel. *Natur Landschaft* 53 (10): 308-312. — (*Bundforschungsanstalt f. Naturschutz u. Landschaftsökol., Heerstr. 110, D-5300-Bonn-Bad Godesberg-1, GFR*). Reference is made (p. 309) to the well-known

case of *Coenagrion hylas* at Zwingsee, Upper Bavaria, which is often cited as an example of species destruction by overcollecting (cf. *OA* No. 1403). — (*Abstracter's Note*: The irresponsible overcollecting of *C. hylas* at this locality has certainly done much damage to the image of amateur dragonfly collectors, one of the consequences of which is the circumstance that the discoverers of new localities of this sp. are reluctant to disclose their location, hindering therewith the increase of our knowledge on its distribution in Europe. On the other hand, it is unlikely that overcollecting of adults during a limited time and within a single season would have destroyed the population. The latter has been annihilated in the subsequent years by the destruction of the habitat, sanctioned by the local political authorities and for the sake of local economic interests).

1979

- (3166) BRIGHAM, W.U. & A.F. BRIGHAM, 1979. *Anax longipes* Hagen and *Neurocordulia xanthosoma* (Williamson), two dragonflies new to Illinois (Odonata: Aeshnidae, Corduliidae). *Trans. Illinois Acad. Sci.* 72 (2): 91-92. — (*St. Nat. Hist. Survey Div., Illinois Inst. Nat. Resources, 172 Natural Resources Bldg, Urbana, Illinois 61801, USA*).
A. longipes is recorded from Moultrie Co., and *N. xanthosoma* from Pope Co. These are the first records of these spp. from Illinois, USA.
- (3167) DOLL, R. & E. HEMKE, 1979. Das Naturschutzgebiet "Degensmoor" bei Wessenberg (Kreis Neustrelitz). *Natur Naturschutz Mecklenb.* 15: 63-72. — (*Authors' address not stated*).
 An extensive account of the vegetation of the nature reserve Degensmoor nr Wessenberg, German Democratic Republic, is followed by some faunistic notes. The latter include a list of 17 odon. spp.; *Coenagrion hastulatum*, *Aeshna subarctica*, *Epithea bimaculata* and *Leucorrhinia albifrons* are of some interest.
- (3168) LEHMAN, G., 1979. Aus der nordtiroler Libellenfauna. *Jber. Bundesgymn. Kufstein* 72: 13. — (*Stimmerfeldstr. 17, A-6330 Kufstein*).
Nehalennia speciosa is added to the list of Northern Tyrol, Austria (cf. also *OA* No. 3186), bringing the number of odon. spp. so far recorded from this province up to 62. *Somatochlora alpestris* and *S. flavomaculata* are new to the region of Kufstein.
- (3169) SATO, Y., 1979. Experiments with *Calopteryx cornelia*. *Insectarium, Tokyo* 16 (8): 186-190. (Japanese, with Engl. title). — (3-17-16, Narita-nishi, Suginami-ku, Tokyo, 166, JA).
 Report on experimental and field work, with emphasis on the reproductive behaviour, and containing numerous field photographs.
- (3170) SHIRGUR, G.A., 1979. Observations on wettability and cuticle permeability of some of the fresh-water predatory beetles, bugs and odonatan naiads for eradication from fish nurseries, using a nonionic surfactant, Hyoxid 1011. *J. Anim. Morphol. Physiol.* 26 (1/2): 1-9. — (*Taraporevala Mar. Biol. Res. Stn, Bombay, Maharashtra, India*).
 Applications for controlling the said aquatic insects in fish nurseries are discussed. The toxicity of chlorine and Hyoxid 1011 was tested. Insect respiration, wettability and cuticle permeability determined the mortality rates from the chemicals. The effects of each chemical used separately and combined are analyzed.
- (3171) SINGH, S.D., D. MUKESH & R. GARG, 1979. Comparative studies on the total glycogen reserves of some adult insects. *Indian J. Zool.* 7 (1): 1-6. — (*Dept. Zool., Punjabi Univ., Patiala, India*).
 Studies on Hemiptera, Orthoptera, Odon., Hymenoptera, Lepidoptera and Coleoptera indicate no uniform pattern in the reserves of hemimetabolous and holometabolous insects; however, fast flying Hymen. store comparatively higher amounts of glycogen than other insects studied. The highest level

was recorded in the wasp *Polystes hebaeus*, while the male of *Rhyothemis variegata* (Odon.) contained the lowest. Among insects studied, mature females always contain more than mature males.

- (3172) UÉDA, T., 1979. Tandem and guarding — plasticity of males' reproductive tactics in *Sympetrum parvulum*. *Insectarium*, Tokyo 16 (8): 180-185. (Japanese, with Engl. title and fig. captions). — (*Dept. Zool., Fac. Sci., Kyoto Univ., Sakyo, Kyoto, 606, JA*). This is an abbreviated Japanese language version of the paper listed in *OA* No. 2741.

1980

- (3173) ANSELIN, A., 1980. Over het voorkomen van de roodoogjuffers *Erythromma viridulum* (Charpentier) en *Erythromma najas* (Hanseman) in het Brugse. [On the occurrence of *Erythromma viridulum* (Charpentier) and *Erythromma najas* (Hanseman) in the Brugge area]. *Stentor* 16 (3): 45-56. (Dutch). — (*Diksmuidse Heirweg 114, B-8200 St. Andries*).
Field notes on the habitats and status of the 2 spp. in the area of the city of Brugge, Belgium.
- (3174) BECKER-PLANTEN, H.D. & H. SCHUMANN, 1980. Beispiele geschädigter Landschaften im Raum Hannover und angrenzender Gebiete. *Ber. naturh. Ges. Hannover* 123: 177-191. (With Engl. s.). — (Second author: *Grünwaldstr. 25, D-3000 Hannover-1, GFR*).
Some examples of damage to nature in the Hannover area and the adjacent regions, Federal Republic of Germany, are stated and discussed. On p. 186, a list is given of 10 odon. spp. of particular interest, known to occur in the Warmbüchener Moor, all of which are seriously threatened or are likely to have already disappeared in the past few yrs (*Ceriatrigon tenellum*, *Coenagrion lunulatum*, *Aeshna subarctica*, *Anax imperator*). Attention is also drawn to the confusion, caused in faunistic literature by the use of non-standardized German vernacular dragonfly names.
- (3175) BORDONI, A., S. CARFI & F. TERZANI, 1980. Odonati dell'Alta Val Bormida. *Redia* 63: 55-65, pl. 1. (With Engl. s.). — (*Mus. Zool. "La Specola", Univ. Firenze, Via Romana 17, I-50125 Firenze*).
Annotated list is given of 29 spp. recorded from the Bormida High Valley, Savona prov., Liguria, Italy. The local fauna is characterized by the abundance of *Cordulegaster boltoni* and *C. bidentatus*. *Sympetrum vulgatum* has not been previously known from Liguria.
- (3176) BOURNAUD, M., G. KECK & P. RICHOUX, 1980. Les prélèvements de macro-invertébrés benthiques en tant que révélateurs de la physionomie d'une rivière. *Annls Limnol.* 16 (1): 55-75. (With Engl. s.) — (*Biol. anim. & Zool., Univ. Lyon-1, F-69622 Villeurbanne*).
32 macroinvertebrate samples were taken with a Surber sampler at 13 stations of the Furans and its tributaries, Bas-Bugey, France. "*Calopteryx* sp." is the only odon. taxon recovered in this way.
- (3177) CARFI, S., P. DEL CENTINA & F. TERZANI, 1980. Odonati raccolti in Sicilia, Calabria e Basilicata negli anni 1963-1977. *Redia* 63: 37-47. (With Engl. s.). — (*Ist. Zool., Univ. Firenze, Via Romana 17, I-50125 Firenze*).
24 spp. from Sicily, Calabria and Basilicata, all Italy, represented in the collections of the Zool. Mus. "La Specola", Univ. Firenze, are listed along with the usual locality data and some field annotations. The variation of the accessory genitalia in *Orthetrum ramburi* is illustrated and discussed in detail. *Onychogomphus uncatus* is new to Sicily and its terminalia are illustrated.
- (3178) EDMUNDS, G.F. & C.E. EDMUNDS, 1980. Predation, climate, and emergence and mating of mayflies. *In: J.F. Flannagan & K.E. Marshall, [Eds], Advances in Ephemeroptera biology*, pp. 277-285, Plenum, New York (With Fr. and Germ. s's). —

(Dept. Biol., Univ. Utah, Salt Lake City, Utah 84112, USA).

With reference to J.E. Bishop's monograph (cf. OA No. 3068) it is argued (p. 278) that Odon. are the most significant daytime predators on mayflies in Malaysia rather than birds.

- (3179) FRANKE, U., 1980. Libellen im Simmelried bei Hegne auf dem Bodanrück und ihre Vergesellschaftung. Jh. Ges. Naturk. Württemberg 135: 255-267. — (Teggingerstr. 1, L-7760 Radolfzell, GFR).

The odon. fauna of the Simmelried, western part of the Bodan Lake area, German Federal Republic, is discussed. Out of 29 recorded spp., 22 are autochthonous, constituting 2 types of odon. "associations".

- (3180) HADLEY, M., 1980. Migrant dragonfly at mercury vapour light. Ent. Rec. J. Var. 92 (10): 258. — (Nature Conserv. Council, 19-20 Belgrave Sq. London, SW1X 8PY, UK). A specimen of *Aeshna mixta*, entering the Robinson trap, at Eastbourne, E. Sussex, United Kingdom (Aug. 12, 1979), is recorded.

- (3181) HARITONOV, A.Yu., 1980. Pervyy opyt ustanovleniya kontaktov odonatologii i arheologii. [The first attempt at a contact between odonatology and archeology]. In: V.A. Posrednikov, Ed., *Novye metody v arheologii*, p. 46. Tomsk Univ., Tomsk. (Russian). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk). A note on the same material as first published in the paper listed in OA No. 2597.

- (3182) HILTON, D.F.J., 1980. The effect of Kraft paper mill effluents on insects inhabiting the St. Francis River near East Angus, Quebec. Anns Soc. ent. Québec 25: 179-189. (With Fr. s.). — (Dept. Biol. Sci., Bishop's Univ., Lennoxville, Que., J1M 1Z7, CA). Of the 6 orders collected, only the Ephemeroptera and Trichoptera showed statistically significant reductions (below the mill) in the number of families, genera and individuals.

The Odon. mentioned are *Gomphus descriptus* and *Macromia illinoiensis*.

- (3183) JOHNSON, D.M. & P.H. CROWLEY, 1980. Odonata "hide and seek": habitat-specific rules? In: W.C. Kerfoot, Ed., The evolution and ecology of zooplankton communities, pp. 569-579. Univ. Press New England, Hanover, N.H. — (Dept. Biol. Sci., Univ. Kentucky, Lexington, Kentucky 40506, USA).

Odon. are dominant predators in the littoral zone of many lakes, and face the familiar problem of avoiding predators and of capturing prey. Niche space is apparently partitioned by them primarily along a habitat (microhabitat) axis, though seasonality and food may also be important. Fish-predators appear to restrict the Odon. to one or two species-specific life-styles: a sluggish, cryptic, smaller, tactile, slow-growing type; and an active, larger, visual, rapidly growing type. Coexistence of Odon. and benthic Cladocera depends on apparent shifts in predator and prey behaviour with prey densities, stabilizing properties of the numerical, developmental and functional responses of these predators to their prey, and the complexity of littoral structure. (Authors).

- (3184) KLEIN, W. & F. KORTE, 1980. Case and comparative studies on xenobiotics in terrestrial and aquatic ecosystems. In: Agrochemical residue-biots interactions in soil and aquatic ecosystems, pp. 3-21. Panel Proc. Ser., Int. Atomic Energy Agency, Vienna [Wien]. — (Inst. Ökologische Chemie, Ges. Strahlen- & Umweltforschung, Neuherberg, GFR).

Case studies on agrochemical fate in soils, plants, animals and water revealed problems of long-term persistence, bound residues, species diversity, etc. The information obtained from each single experiment brought forward the need for an integrated approach. Each chemical should be characterized by an ecotoxicological profile analysis. Examples are given of such an analysis made in rigorously standardized ex-

periments. The results are used for a comparative ranking of the xenobiotic according to its ecotoxicological risk. For this purpose the experimental data are completed by data regarding the utilization of chemicals, etc. As an example of such a complete analysis HPMAA (hydrolyzed polymaleic acid anhydride) is given and larval *Libellula quadrimaculata* is among the organisms used. Residue levels recovered, based on radioactivity measurements, are given in graphs.

- (3185) KNUTSON, L., 1980. The insect collection at the Instituto de Zoologia Agricola (I.Z.A.), Facultad de Agronomia, Central University of Venezuela, Maracay. Proc. ent. Soc. Wash. 82 (3): 512-513. — (*IIBIII, Agric. Res., Sci. & Educ. Admin., USDA, BARC-W, Beltsville, Maryland 20705, USA*).

The Institute of Agricultural Zoology is the major centre of taxonomic research in Venezuela. The insect collection consists of over 1.5 million prepared specimens. Odon. are among the well-represented orders. — (*Abstracter's Note*: The odon. curator and the successor of the late Dr. J. Racensis (deceased Apr. 1980) is Mr. J. De Marmels, Inst. Zool. Agric., Fac. Agron., Univ. Central Venezuela, Apartado 4579, Maracay-2101-A, Venezuela).

- (3186) LEHMANN, G., 1980. Die "Schwemm" bei Walchsee — Nordtirols grösste erhaltene Moorlandschaft. Jber. Bundesgymn. Kufstein 73: 16-18. — (*Stimmerfeldstr. 17, A-6330 Kufstein*).

The "Schwemm" moor on the foot of the Kaisergerbirge Mts., between the rivers of Inn and Grossache, Northern Tyrol, Austria, is described, and a reference is made to *Nehalennia speciosa* newly discovered there (cf. also *OA* No. 3168).

- (3187) MIELEWCZYK, S., 1980. G. Jurzitza — Unsere Libellen. Biul. inf. pol. Tow. ent. 1979 (23: 100-102). (Polish). — (*Dept. Agrobiol., Polish Acad. Sci., Swierczewskiego 19, PO-60-809 Poznan*).

Extensive book review of the volume listed in *OA* No. 2121.

- (3188) NARASIMHAMURTI, C.C. & S.N. AHAMED, 1980. A new septate gregarine, *Actinocephalus bradinopygi* sp.n. from the dragon fly, *Bradinopyga geminata* Rambur. Acta protozool. 19 (1): 61-68. — (With Fr. s.). — (Second author: *Government H.S. School, Pasighat, Arunachal Pradesh, India*).

The morphology and life-history of the new sp. are described. The gregarine was discovered in the gut of adult *B. geminata*, collected at Visakhapatnam, Andhra Pradesh, India. — (*Abstracter's Note*: Due to the wrong typographic reproduction of the name "S. Nazeer Ahamed" in the primary journal, the paper listed in *OA* No. 2988 is wrongly alphabetized).

- (3189) NIEHUIS, M., 1980. [Faunistisch-ökologische Mitteilungen] 32. (Odonata: Coenagriidae) — *Coenagrion lindeni* (Selys) — Nachweise in der Westpfalz und im Nahetal. Pfälzer Heimat 31 (3): 112. — (*Im vorderen Grossthal 5, D-6743 Albersweiler, GFR*).

A new record of *C. lindeni* from the western Pfalz, German Federal Republic, is given, and the occurrence of this sp. in Pfalz is discussed.

- (3190) NOTULAE ODONATOLOGICAE. Semi-annual bulletin of the International Odonatological Society. Published by the Societas Internationalis Odonatologica (S.I.O.), Utrecht. Vol. I, No. 6 (Dec. I, 1980). Annual subscription Hfl. 25,— net. — (*c/o Dept. Anim. Cytogen. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL*).

Cannings, R.A. (Dept. Ent., British Columbia Prov. Mus., 601 Belleville Str., Victoria, B.C., V8V 1X4, CA): Ecological notes on *Sympetrum madidum* (Hagen) in British Columbia, Canada (Anisoptera: Libellulidae) (97-99); — *Lounibos, L.P.* (Florida Med. Ent. Lab., P.O.B. 520, Vero Beach, Fla 32960, USA): Larval Odonata in water-containing treeholes at the Kenya coast (99-100); — *Utzeri, C.* (Ist. Zool., Univ. Roma, Viale

dell'Università 32, I-00100 Roma): Considerations on cannibalism in Zygoptera (100-102); — *Geijskes, D.C.* (Rijksmus. Nat. Hist., Raamsteeg 2, Leiden, NL): Distribution and zoogeography of Odonata on the Lesser Antilles (102-103); — *Gloyd, L.K.* (Div. Insects, Mus. Zool., Univ. Michigan, Ann Arbor, Mich. 48109, USA): The status of the generic names *Erythemis*, *Leptemmis*, and *Mesothemis* (Anisoptera: Libellulidae) (103-104); — *Kiauta, B. & M.A.J.E. Kiauta* (Dept. Anim. Cytogen. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL): The karyotypes of *Aeshna subarctica elisabethae* Djak. and *Somatochlora alpestris* (Sel.) from Switzerland (Anisoptera: Aeshnidae, Corduliidae) (104-105); — *Van Noordwijk, M.* (Univ. Juba, CNRES, c/o Interflight Kenya, Juba Office, P.O.B. 42106, Nairobi, Kenya): Dragonfly behaviour over shining surfaces (105); — *Winstanley, W.J.* (Zool. Dept., Victoria Univ., Private Bag, Wellington, NZ): Avoidance behaviour in Odonata (105-106); — *Inoue, K.* (5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA): Introduction [to the Abstracts of Papers presented at the Mnais Symposium, Kyoto, Japan, January 5-6, 1980] (106); — *Asahina, S.* (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA): Distribution and differentiation of the Japanese Mnais: a working hypothesis (106-107); — *Suzuki, K. & M. Eguchi* (Dept. Biol., Coll. Lib. Arts, Toyama Univ., Gofuku 3190, Toyama, 930, JA): The Mnais infraspecific forms and their geographic distribution in the Hukuriku District, central Honshu, Japan (107); — *Obana, S.* (3-4-10, Kinryo-cho, Sakai, Osaka Pref., 590, JA): A tentative clue to polymorphism in Mnais (107-108); — *Inoue, K.* (address cf. above): Studies on Mnais pruinosa Sel. that have been carried out by the members of the Kansai Research Group of Odonatology (108-109); — *Suzuki, K., H. Ubukata & M. Eguchi* (address first author cf. above): Infraspecific forms, habitat segregation and reproductive isolation in Mnais of the Hokuriku and Hokkaido districts, Japan, with a historical review on the classification of the species (109); — *Nomakuchi, S., Y.*

Okame, K. Higashi, M. Harada & M. Maeda (Dept. Biol., Fac. Sci., Kyushu Univ., Fukuoka, 812, JA): An analytical study of the territorial behaviour of *Mnais p. pruinosa* Sel. (109-110); — *Mizuta, K.* (Hiroshima Agric. Coll., Saijo-cho, Kamogun, Hiroshima Pref., 724, JA): The ratio of *Mnais p. pruinosa* ♂-f. *esakii* to ♂-f. *strigata* and the differences in their behaviour observed in Hiroshima Prefecture, Japan (110); — *Nishida, T.* (Fac. Sci., Kyoto Univ., Kyoto, 606, JA): Territoriality and mating success in *Mnais pruinosa* nawai Yamamoto (110); — *Iwasaki, M.* (deceased): Comparative study of reproductive behaviour of seven genera of Calopterygidae (100-111); — Breeding behaviour of *Mnais p. pruinosa* Sel. in Kyoto (111); — *Eguchi, M.* (Dept. Biol., Fac. Sci., Kanazawa Univ., Marunouchi 1-1, Kanazawa, 920, JA): Population studies on *Mnais pruinosa* nawai Yamamoto and *M. p. pruinosa* Sel. coexisting in a creek (111-112); — *Inoue, K.* (address cf. above): Obituary notice: Yoshitsugi Tarui (112).

- (3191) RAWLUK, E., 1980. Wazki [Dragonflies]. Przyroda polska 1980 (7/8): 41. (Polish). — (c/o Editors, ul. M. Reja 3/5, PO-02-053 Warszawa).

A general talk on dragonflies, containing a reference to Odonatologica. A Polish translation (by M. jastrun) of the first stanza of J.W. GOETHE's 'dragonfly poem', "Die Freuden" is also included.

- (3192) REIST, J.D., 1980. Predation upon pelvic phenotypes of brook stickleback, *Culaea inconstans*, by selected invertebrates. Can. J. Zool. 58 (7): 1253-1258. (With Fr. s.). — (Dept. Ichthyol. & Herpetol., Royal Ontario Mus., 100 Queen's Park, Toronto, Ontario, M5S 2C6, CA).

Laboratory experiments investigated selective predation by aquatic insects upon phenotypes of brook stickleback, with and without pelvises, from Wakomao Lake, Alberta, Canada. Predation by the larvae of *Ditiscus* (Coleoptera) resulted in significant selection for individuals possessing 5 dorsal spines. Larval *Aeshna* showed significant

selective predation on the without phenotypes in one year, but no selection during the other year, involving larvae from other area. Predation by *Lethocerus* (Heteroptera) was random upon each phenotype. The situation in *Aeshna* is unclear; it may be due to different sources of the dragonflies or to between-year differences in experiments.

- (3193) RIPPEY, I., 1980. Extension of the known range of *Brachytron pratense* (Odonata: Aeshnidae). *Ir. Nat. J.* 20 (4): 113. — (*13 Enniscrone Park, Portadown, Co. Armagh, N. Ireland, UK*).
B. pratense is reported as new for Co. Londonderry, N. Ireland, United Kingdom, and new records are also given for Co. Fermanagh. These records considerably extend the known range of the sp. in Ireland.
- (3194) ROBACK, S.S., L. BERNER, O.S. FLINT, N. NIESER & P.J. SPANGLER, 1980. Results of the Catherwood Bolivian-Peruvian Altiplano Expedition. Part I. Aquatic insects except Diptera. *Proc. Acad. nat. Sci. Philadelphia* 132: 176-185. — (*Acad. Nat. Sci. Philadelphia, 19th and The Parkway, Philadelphia, Penn. 19103, USA*).
 A total of 28 stations were collected in the course of the said 1978 expedition. The material includes 3 odon. spp. (2 at the Titicaca Lake), but no specific names are stated.
- (3195) SEBASTIAN, A., MYAT MYAT THU, MAY KYAW & MYINT MYINT SEIN, 1980. The use of dragonfly nymphs in the control of *Aedes aegypti*. *SEast Asian J. trop. Med. publ. Health* 11 (1): 104-107. — (*Med. Ent. Res. Div., Dept. Med. Res., Min. Health, Rangoon, Burma*).
 The predatory rates of the odon. larvae on *A. aegypti* were studied in the laboratory and under field conditions. Libellulid larvae predate on mosquito larvae and pupae readily. The rate of consumption was 133 ± 21 for all stages of mosquito/medium size dragonfly per 24 hrs. In container habitats, complete elimination of all mosquito larvae and pupae was achieved between day 4 and 9, depending on density of aquatic stages. The odon. larvae as predators could be used in biological control of *Aedes* mosquitoes.
- (3196) TANAKA, Y. & M. HISADA, 1980. The hydraulic mechanism of the predatory strike in dragonfly larvae. *J. exp. Biol.* 88: 1-19. — (*Zool. Inst., Fac. Sci., Hokkaido Univ., Sapporo, JA*).
 (1) *Aeshna* larvae catch prey with a fast-moving elongated labium. The mechanism of this movement was analysed by high-speed cinematographs and by hydrostatic and electrophysiological measurements. — (2) The strike movement consists of an initial, mid and late phase. The angular acceleration of the joints of the labium is 2.6×10^5 and $7.8 \times 10^5 \text{ deg.s}^{-2}$ during the initial and mid phase respectively. The torque necessary for the acceleration was calculated to be 1.3×10^{-5} and $4.0 \times 10^{-5} \text{ N.m}$ for the initial and mid-phases respectively; — (3) The relation between the pressure applied to the labium and the extension torque at the joints has been established. No torque develops about the postmentum-prementum joint as long as the click of the flexed labium is engaged; — (4) The power production of the extensor muscles is less than the power output of the mid phase. The power for the mid phase is derived from the internal body pressure developed by the contraction of the abdominal dorsoventral muscles. The required pressure for the mid phase is about 60 cm H₂O if the resistance is neglected and 80 cm H₂O when the resistance is considered; — (5) Abdominal dorso-ventral muscles contract 110-500 ms before the onset of the strike and the body pressure of the animal increases to a peak of 40-120 cm H₂O at the onset of the strike; — (6) The geometry of the labial joints gives the primary flexor muscles of the labium a large mechanical advantage over the extensor muscles in the fully flexed labium, and allows the extensor muscles to contract almost isometrically. — (7) The extensor muscles and the primary flexor muscles co-contract for 75-100 ms before the strike. The strike movement begins when the flexor muscles relax. The stored energy in

the extensor system is released suddenly and disengages the click producing the initial phase. Once the click is disengaged the internal pressure produces the large torque to move the labium with great acceleration during the mid phase. (Authors).

- (3197) TERZANI, F., 1980. Odonati raccolti in provincia di Livorno. Redia 63: 97-108. (With Engl. s.). — (*Mus. Zool. "La Specola", Univ. Firenze, Via Romana 17, I-50125 Firenze*).
21 spp. are listed from 21 localities in the prov. of Livorno, Italy. Among these, *Ceriagrion tenellum*, *Coenagrion puella* and *Orthetrum cancellatum* are the first provincial records.
- (3198) TÜRKAY, M., 1980. Bericht über die Bundesartenschutzverordnung (BArtSchV). Mitt. int. ent. Ver. 5 (4): 54-60. — (*Kohl-seeweg 5, D-6072 Dreieich-3, GFR*).
Critical comments on the (German Federal Republic) Federal Species Conservation Act (cf. OA No. 3112), incl. the odon. list.
- (3199) TYAGI, B.K. & V. VEER, 1980. More records of entomogenous fungi from preserved dragonfly collections. J. Bombay nat. Hist. Soc. 79 (1): 176-177. — (*Malaria Res. Cent., I.C.M.R., 22 Sham Nath Marg, Delhi-110054, India*).
The following spp. of fungi were obtained from dragonfly museum specimens in Dehra Dun, India: *Alternaria* sp., *Aspergillus flavus*, *A. nidulans*, *Coelomomyces* sp., *Entomophthora aphidis*, *Spicaria javanica*, and *Stemphylium* sp. *Spicaria* has not been previously reported from any insect material. Contrary to the opinion expressed earlier (cf. OA No. 2822), the fungal infestation is non-specific, and several spp. can simultaneously infest one and the same specimen.
- (3200) WATERSTON, A.R., 1980. Insects of Saudi Arabia. Odonata. Fauna Saudi Arabia 2: 57-70. (With Arabic s.). — (*Royal Scottish Mus., Edinburgh, EHI 1JF, UK*).
The odon. fauna of Saudi Arabia is compiled from various sources. Out of 25 known spp., 22 are recorded for the first time from the Kingdom. Various faunal elements are represented as follows: Ethiopian 10, — Ethiopian-Oriental 7, — Oriental 1, — Eremic 6, — and 1 sp. is a global intertropical migrant. — As new is described *Pseudagrion inconspicuum arabicum* ssp.n. (♂ holotype, ♀ allotype: Suda, 'Asir Sirat, Saudi Arabia; 5-VII-1962; deposited in Royal Scottish Mus., Edinburgh; various paratypes of both sexes). The new ssp. differs from the nominal typical form in the pale thorax and redder markings of the female. — (*Abstracter's Note*: It is unfortunate that at all relevant literature was considered, and that no figures are provided of the new or any other sp.).
- (3201) WHITE, T.R., K.J. TENNESSEN, R.C. FOX & P.H. CARLSON, 1980. The aquatic insects of South Carolina. Part I: Anisoptera (Odonata). Bull. Sth Carol. agric. exp. Stn 632: 1-153. — (*Dept. En. Fish. & Wildf., Clemson Univ., Clemson, S. Carol. 29681, USA*).
This is a catalogue and a citation index combined of all the known records of the 105 anisopteran spp. so far recorded from South Carolina, USA. For each sp. a map is included showing the number of collection localities per county. The list contains all published and unpublished records. The former are accompanied by bibliographic references, annotated to the utmost detail. For the heretofore unpublished records the exact locality, collection date, collector and the authority responsible for identification are stated. — (*Abstracter's Note*: The map scale adopted did not allow a topographic mapping of the localities. In view of the exactitude of bibliographic and locality citations, however, this is not a handicap. To the contrary, the detailed documentation and the general organization of the paper are far above the quality of those encountered in numerous, if not most of the similar works in the Old World. On the other hand, the number of records, e.g. in Europe, is too high, and the available manpower and funds too limited to enable a similar well-documented treatment).

- (3202) WHITE, T.R., WEAVER, J.S., III & R.C. FOX, 1980. Phoretic relationships between Chironomidae (Diptera) and benthic macro-invertebrates. *Ent. News* 91 (3): 69-74. — (507 Henderson Drive, Augusta, Georgia 30909, USA).
7 streams in the Piedmont and Coastal Plain regions of South Carolina, USA, were sampled to determine frequency and composition of aquatic phoretic relationships. In one stream, 71.4% of Odon. collected hosted phoretic midges, *Stenonema smithae* (Ephem.) and *Neotopsyche exquisia* (Trich.) were also found with phoretic Chironomidae. In a population of snails at Wildcat Creek, 80.0% were phoretic symbionts. Aquatic phoretic relationships were concluded to be relatively common in the regions studied, probably due in part to the prevalence of sand-bottomed streams.
- (3203) WINTERBOURN, M.J., 1980. The freshwater insects of Australasia and their affinities. *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 31: 235-249. — (Zool. Dept., Univ. Canterbury, Christchurch-1, NZ).
Stream faunas of New Zealand, south-eastern Australia and Tasmania are characterized by numerous cool-adapted species of Ephemeroptera, Plecoptera, Mecoptera and Diptera with southern (austral) affinities. They include a number of amphinotic (= circum-Antarctic) groups with close relatives in South America and their distributions seem best explained in terms of vicariance of an ancestral, Gondwanaland fauna. A second major component of the Australasian freshwater insect fauna has strong Oriental affinities and is thought to represent a more recent element which entered New Guinea, Australia, New Zealand and islands to the east in the last 20 million years. Included in this element are Trichoptera and Diptera with stream-dwelling larvae and Hemiptera, Coleoptera, Diptera and Odonata which mainly occur in standing waters. Mountains and islands formed when the Australian and Asian plates met in the late Cenozoic would have provided dispersal pathways for many of these groups. Colonisation of islands in the Pacific has resulted from early land connections, e.g. elements of the New Caledonian fauna, dispersal by air and most recently by man. (Author). — (*Abstracter's Note*: Odon. and aquatic Lepidoptera are specifically excluded from a detailed discussion).
- (3204) WISE, K.A.J., 1980. Records of South Pacific dragonflies (Hexapoda: Odonata). *Rec. Auckland Inst. Mus.* 17: 175-178. — (*Auckland Inst. & Mus., Private Bag, C.P.O., Auckland, NZ*).
14 spp. of South Pacific Odon. represented in the Auckland Museum collections are recorded. Included are spp. from Norfolk Island, Fiji (particularly the Lau Group) and the Cook Islands.
- (3205) YOUNG, A.M., 1980. Feeding and oviposition in the giant tropical damselfly *Megaloprepus coerulatus* (Drury) in Costa Rica. *Biotropica* 12 (3): 237-239. — (*Sect. Invert. Zool., Milwaukee Public Mus., 800 West Wells Str., Milwaukee, Wisc. 53233, USA*).
Feeding by adult *M. coerulatus* at the large webs of *Nephila clavipes* (Araneidae) was witnessed at 2 localities in Costa Rica (Jan.-March, Sept.-Oct.). A total of 52 visits to webs was scored, of which about 25% resulted in successful capture of various small kleptoparasitic spiders. Most odon. were males. The typical behavioural sequence was: (1) dragonfly approaches web and flutters at it for 10-50 sec, (2) a small spider is plucked from the web, (3) the dragonfly alights on a nearby plant to devour the prey. There were no apparent responses by the host spider to these visits, and an individual web is often visited by the dragonfly on several successive days. — In Sept. oviposition was noticed in a clear rain-water pool, accumulated in a cragged indentation in the trunk of a fallen tree. The female alighted on the bark above the water line at the side of the pool and began probing crevices in the bark just under the water with the tip of the abdomen. This activity continued for 5 min, and presumably resulted in eggs being

deposited. (On the biology of *Nephila*, the webs of which are known to harbor various kleptoparasitic spiders, cf. *OA* No. 675; for the title of another paper on *Megaloprepus*, by the same author, cf. *OA* No. 3233). — (*Abstracter's Note*: The references were accidentally omitted in the course of printing. A xerox of these, from the original manuscript, will be supplied by the author upon request).

1981

- (3206) (Anonymous), 1981. Dragonfly expert to leave. *Chronicle* (Zimbabwe), issue of Feb. 11, 1 p.
A local daily's article on the occasion of Dr. E. Pinhey's retirement from the National Museum of Bulawayo, Zimbabwe (Feb. 27, 1981). A brief outline of his African career is given as follows: 1939: arrival to Rhodesia, joining first the Territorials, then the RAF; — 1942: joining the Dept. of Agric., Salisbury; — 1948: Assistant Professional Officer in Ent., Transvaal Mus.; — 1949: Keeper of Ent., Coryndon Mus., Nairobi; — 1953: Keeper Invertebr. Zool., Natn. Mus., Bulawayo; — 1969: Curator Natn. Mus., Bulawayo and Keeper Ent.; — 1972: retired as Curator; — 1975: retired as Keeper and became Associated (Research) Entomologist; — 1981: returning to United Kingdom. — (For Dr. Pinhey's biography and odonatol. bibliography cf. *Odonatologica* 5: 97-105; 1976).
- (3207) (Anonymous), 1981. Dragonfly under threat. *Evening News*, Scarborough, issue of Jan. 7, p. 13.
This is a rather exhaustive report, directed at the general reader on the Inaugural Meeting of the Odonata Specialist Group, Survival Service Commission, International Union for Conservation of Nature and Natural Resources (IUCN), Aug. 4-5, Kyoto, Japan, chaired by Sir Norman W. Moore (UK), and attended by S. Asahina (Japan), G. Bick (USA), P.S. Corbet (New Zealand), H. Dumont (Belgium), F. Howarth (Hawaii), B. Kiauta (the Netherlands), D. Paulson (USA) and J.A.L. Watson (Australia); absent: J. Furtado (Malaysia). In formulating the action plan it was agreed that dragonflies should be conserved throughout the world and that the emphasis should generally be on communities rather than on spp. 5 main projects for IUCN's 1981-1983 action programme were outlined, viz. Conservation requirements of *Hemiphlebia mirabilis* in Australia, Ecological requirements of *Epiophlebia laidlawi* in Nepal and India, Survey of the odon. fauna of eastern slopes of the Andes in Ecuador, Ecological requirements of *Megalagrion pacificum* in the Hawaii, and Survey of the Odon. of northeastern Turkey. Endangered status was proposed for *Coenagrion hylas* (Europe), *Ischnura gemina* (USA), *Megalagrion pacifica* (Hawaii), *Cordulegaster sayi* (USA), and *Hemiphlebia mirabilis* (Australia). The next meeting is scheduled on Aug. 16, 1981 in Chur, Switzerland. — (*Abstracter's Note*: Not all information stated here is mentioned in the article).
- (3208) ASAHINA, S., 1981. A revision of the Himalayan dragonflies of the genus *Cephalaeschna* and its allies (Odonata, Aeschnidae). Part I. *Bull. natn. Sci. Mus., Tokyo* (A) 7 (1): 27-49. — (*Takadano-baba 4-4-24, Shinjuku-ku, Tokyo, 160, JA*)
This is the first part of a (long needed) revisional treatment of the group. It includes a brief historical survey, a revised key to the genera (*Petaliaeschna*, *Periaeschna*, *Cephalaeschna*, *Gynacanthaeschna*), and detailed descriptions, illustrated and considerations of the following 7 taxa *C. orbifrons* Sel., *C. masoni* (Martin), *C. acutifrons* (Martin), *C. triadica* Lieft. (a note, with figs from the paper listed in *OA* No. 1670), *C. viridifrons* (Fraser), *C. klapperichi* (Schmidt), and *G. sikkima* (Karsch).
- (3209) BAKER, R.L., 1981. Use of space in relation to areas of food concentration by nymphs of *Lestes disjunctus* (Lestidae, Odonata) in captivity. *Can. J. Zool.* 59 (1): 134-135. (With Fr. s.). — (*Dept. Zool., Univ. Alberta, Edmonton, Alberta, T6G 2E9, CA*).

Laboratory experiments provided no evidence that solitary larvae of *L. disjunctus* remain near areas of food concentration. There was also no evidence that the presence of other larvae affected the use of feeding areas. These observations are in contrast to previous evidence on the larvae of *Coenagrion resolutum* (cf. *OA* No. 2996) and support the hypothesis that life histories are affected by spacing behaviour of larvae.

- (3210) BAUST, J.G., A.H. BENTON & G.D. AUMANN, 1981. The influence of off-shore platforms on insect dispersal and migration. *Bull. ent. Soc. Am.* 27 (1): 23-25. — (*Dept. Biol., Univ. Houston, Houston, Texas 77004, USA*).
23 spp. (some not identified) of 6 orders, collected at an oil platform, 160 km SSE of Galveston, Texas, USA are listed. *Tramea lacerata* is the only dragonfly mentioned. The possible influence of the Gulf Coast off-shore oil platform complex on insect dispersion is discussed, and it is suggested that the "chain" of such platforms may be responsible for the introduction of non-native spp. into the continental United States.
- (3211) BELLE, J., 1981. A new species of *Epigomphus* from Mexico (Odonata: Gomphidae). *Ent. Ber., Amst.* 41 (4): 61-63. — (*Onder de Beumkes 35, 6883 HC Velp, NL*).
E. paulsoni sp. n. (♂ holotype: stream 27.2 mi N of Ocozocoautla, Chiapas, Mexico; 21-VIII-1965) is described and illustrated. ♀ is unknown. The holotype is deposited in the Florida State Collection of Arthropods, Gainesville. This is the 17th known member of the genus.
- (3212) BELLE, J., 1981. The dragonflies of Alderney. Alderney Soc., Alderney, Channel Islands. 8 pp. — (*Onder de Beumkes 35, 6833 HC Velp, NL*).
The pamphlet is a critical review of all what is known on the odon. fauna of the Alderney Island, Channel Island. It includes a brief outline of the history of odonatol. research there, a complete bibliography, and a number of conservancy suggestions. Although 6 spp. were known from the island, only 2 were encountered during the author's 1978 exploration, incl. *Sympetrum striolatum*, which has not been previously recorded from the island, bringing the total number of the Alderney spp. up to 7. (For a review of the odon. fauna of the Sarmial Islands cf. *OA* No. 3001).
- (3213) BENKEN, T., 1981. "Wachtumer Paol" — ein bedeutendes Feuchtbiotop Süddoldenburgs. *Jb. Oldenburg. Münsterl.* 1981: 185-194. — (*Poststr. 2, D-4573 Löningen, GFR*).
The odon. coenosis of the Wachtumer Paol, a small pond near Löningen. Lower Saxony, German Federal Republic, consists of 24 spp., the status of which is analyzed.
- (3214) CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS [Newsletter of the Dutch Dragonfly Workers], No. 1 (Apr., 1981). Issued by the Werkgroep Nederlandse Libellenonderzoekers [Association of the Dutch Dragonfly Workers], Bussum; edited by M. Verdonk & J.W. Schoorl. — (Dutch). — (Annual subscription (2 issues): Hfl. 10,—. — (Editorial & Business address: *Miss M. Verdonk, Floraliaan 47, 1402 NJ Bussum, NL*; — orders from the Netherlands and the European Common Market countries by sending the subscription fee to the Postal Giro Account No. 3612729, on the name of J.W. Schoorl, Amsterdam).
This is the continuation of the former "Contactbrief Nederlandse Libellenonderzoekers" (cf. *OA* No. 867), and is in the first place a semiannual newsletter, publishing also brief scientific notes on the Dutch fauna and/or of special interest to Dutch odonatologists. The titles are given also in Engl. translation. The first issue contains an Editorial, and various news items on S.I.O., the Netherlands Section of the European Invertebrate Survey (Odon.) and on the odonatol. work of Dutch Youth Federations of Nature Study. It also includes an announcement of the Sixth Colloquium of Dutch

Dragonfly Workers (Amsterdam, May 16, 1981), and an appeal for cooperation in and coordination of observations on the dragonfly migrations in the Netherlands (coordinator: J.W. Schoorl, Lod. Boisotstr. 20/1, 1057 ZP Amsterdam, NL). — The "Werkgroep" has the status of a "national odonatological association" and is affiliated to S.I.O. The membership is open to all bona fide professional and amateur odonatologists; the subscription is considered automatically as a membership fee. The members enjoy most of the privileges of the full S.I.O. members, but are not receiving the S.I.O. periodicals and have no voting privileges in S.I.O.

- (3215) COSTA, J.M., 1981. Estudo da especiação em *Mnesarete pudica* (Calvert, 1909) Cowley, 1934. [A study on the infraspeciation of *Mnesarete pudica* (Calvert, 1909) Cowley, 1934]. Resum. Com. cient. 8 Congr. brasil. Zool., Brasilia, pp. 45-46, (Port.). — (*Dept. Ent., Mus. Nac. Univ. Fed. Rio de Janeiro, Quinta da Boa Vista, BR-20974 Rio de Janeiro, RJ*).
The existence of 2 structurally distinct geographic forms of *M. pudica* (Hetaeriniidae) in Brazil is reported. The form referred to here as "A" occurs in the states of Rio de Janeiro and Minas Gerais, while the morph "B" is recorded from 2 areas in the state of Sao Paulo. In Rio de Janeiro the "B" individuals were encountered in the "A" population in the ratio 1:1000. It is argued that "B" is the ancient form, from which "A" is phylogenetically derived.
- (3216) COTTON, D.C.F., 1981. Some new records and an appraisal of the published records for *Ischnura pumilio* (Charpentier) (Odonata: Coenagrionidae) in Ireland. Ent. Gaz. 32 (1): 59-64. — (*Dept. Agric. Biol., Univ. College, Dublin, Eire*).
14 records are discussed in detail and mapped.
- (3217) DHRK, 1981. Provisional atlas of the insects of the British Isles. Published by the Biological Records Centre. Part 7. Odonata, dragonflies. Edited by D.G. Chelmick, Second edition. Bull. amat. ent. Soc. 40 (330): 14-15.
Book review of the volume listed in *OA* No. 2789.
- (3218) DOS SANTOS, N.D., 1981. Notas sobre a larva de *Heliocharitidae* (Odonata). [Notes on the larval stage of the *Heliocharitidae*]. Resum. Com. cient. 8 Congr. brasil. Zool., Brasilia, pp. 43-44. (Port.). — (*Dept. Ent., Mus. Nac., Univ. Fed. Rio de Janeiro, Quinta da Boa Vista, BR-20974 Rio de Janeiro, RJ*).
For the first time the larval stage of a member of this neotropical family is described. It originates from the Federal District of Brasilia, and is probably referable to *Heliocharis*. In passing, its structural features are compared to those of *Calopterygidae*, *Amphipterygidae*, *Polythoridae*, and *Megapodagrionidae*.
- (3219) DUNKLE, S., 1981. Odonata collected in Ecuador and Colombia, August-September 1980. Privately issued, 2 pp. — (c/o Prof. Dr. M.J. Westfall, Dept. Zool., Univ. Florida, Gainesville, Fla 32611, USA).
151 spp. are listed, collected on the eastern slopes of Andes, between Baeza and Lago Agrio. Ecuador, at Limoncocha, Ecuador, and on the Bogota-Villavicencio Road and in the vicinity of Monteria, Colombia. — (*Abstracter's Note*: Copies are available from the author and from the Editors of *Odonatologica*).
- (3220) HINTON, H.E., 1981. Biology of insect eggs. Vols I-III. Pergamon Press, Oxford-New York-Sydney-Paris-Frankfurt. The roman pagination is separate for each volume, viz. XXIV, XVIII and XVIII resp., but the arabic pagination is consecutive, viz. 1-474, 475-778, and 779-1126 resp. — (*Author deceased*).
The Odon. are dealt with in Vol. II, pp. 486-494. The titles of the chapters are: "Oviposition", "Structure of the chorion", "Micropyle", "Spumaline", and "Hatching".
- (3221) JOHNS, P.M., 1981. Checklist of New

Zealand terrestrial and freshwater arthropod families. Dept. Zool., Univ. Canterbury, New Zealand. 103 pp. — Price: NZ \$ 3.—
— (*Dept. Zool., Univ. Canterbury, Christchurch-1, NZ*).

A checklist compiled for students at an advanced university level, providing a guide to the local families and the literature about them. Odon. are referred to on pp. 3-4. Two coenagrionid spp. are mentioned as still to be described, and attention is drawn to the omission by F.C. Fraser (1960, Handbook of the dragonflies of Australasia) of 3 libellulid spp. from the New Zealand faunal list.

- (3222) KRISTENSEN, N.P., 1981. Phylogeny of insect orders. *Ann. Rev. Ent.* 26: 135-157. — (*Dept. Ent., Zool. Mus., Univ. Copenhagen, Universitetsparken 15, DK-2100 Copenhagen-Ø*).

It is widely, though not universally, accepted that the Pterygota are monophyletic, and it is generally agreed that 3 high-rank categories can be recognized among extant pterygotes, viz. Ephemeroptera, Odonata and Neoptera. Pterygote groups that do not exhibit the neopterous traits are usually included in the taxon "Palaeoptera". (i.e. a number of Palaeozoic orders, Ephemeroptera and Odon.). It is widely believed that Neoptera arose from palaeopterous ancestors, hence the "Palaeoptera" is a grade rather than a monophyletic taxon. Some authors (Sharov, Kukalova-Peck) are in favour of monophyletic character of Palaeoptera and Neoptera. If the Neoptera arose from "Palaeoptera", some of the extant and/or extinct palaeopterous orders must be phylogenetically closer to Neoptera than the others. The hypothesis of a sister-group relationship between Ephemeroptera and Odonata + Neoptera may appear best substantiated at present. Possible synapomorphies of Odon. and Neoptera include suppression of imaginal molts, tracheization of each wing and pterothoracic leg from the spiracle of its own segment, abdominal spiracles with occlusor muscles inserting directly on spiracular sclerites, veins R and Rs with common stem (Hamilton's termino-

logy), female gonopore unpaired, suppression of superlinguae, and loss of some primitive cephalic and thoracic muscles. If the "Palaeoptera" is considered monophyletic, acceptance of a sister-group relationship between the Ephemeroptera + Odon. and the Neoptera is a corollary, but the assumption that all palaeopterous orders together constitute a paraphyletic assemblage does not preclude that the 2 surviving lineages belonging to this grade could be each other's closest relatives. In Hennig's opinion, the following traits might be synapomorphies of Ephemeroptera and Odonata: presence of intercalary veins, fused maxillary endites in larvae, bristle-like imaginal antennae, and aquatic larval life. It is stressed, however, that the intercalary veins may actually be plesiomorphic, while fused maxillary lobes cannot be ascribed to the ephemeropteran ground-plan. The remaining 2 features can easily be convergencies. Also the absence of crystallomitin in the mitochondrial derivatives of the ephemeropteran and odonate spermatozoa could be explained as convergent.

- (3223) KUMAR, A. & M. PRASAD, 1981. Field ecology, zoogeography and taxonomy of the Odonata of Western Himalaya, India. *Occ. Pap. zool. Surv. India* 20: 1-118. — Price: US \$ 12.—. — (*Zool. Surv. India, 13 Subhash Rd., Dehra Dun-24801, U.P., India*).

Since the original publication (1933-1936) of C.F. Fraser's volumes in the Fauna of British India (for a recent reprint cf. *OA* No. 061) the knowledge of the odon. fauna of the Western Himalaya (Jammu and Kashmir, Himachal Pradesh, and the Kumaon and Garhwal ranges of Uttar Pradesh) has been nearly doubled, largely so due to the extensive surveys conducted by the Zool. Surv. India, and in which, during the past decade, the present authors have intensively participated. In the present monograph an attempt is made to bring together all the available information on the Odon. of this region (162 spp.). Aside of the literature records, almost 20.000 hitherto unpublished

specimens were also considered. The following are the titles (and pagination) of the chapters: "Introduction" (1-4), "Geographical features, divisions and climate of Western Himalaya" (4-5), "Brief description of typical Odonata biotopes in Western Himalaya" (5-8), "Phenology" (8-9), "Key to the Odonata of Western Himalaya" (9-32; based on adult males), "Check list of Odonata of Western Himalaya with notes on field ecology" (32-67), "Zoogeography of Odonata of Western Himalaya" (67-97), "References" (98-104), and illustrations (105-118). The emphasis of the work is on the checklist, which contains data on faunistics, taxonomy (larva and adult), life history, ecology, behaviour etc. Notes on adult flight periods, oviposition, emergence, larval habitats, altitudinal range, etc. are also included, where available. Description of the taxa are omitted, but under the heading of each sp. the bibliographic references are given of the relevant taxonomic (and other) papers.

- (3224) LEGRAND, J., 1981. Désignation de types d'odonates afrotropicaux des collections du M.N.H.N. Paris, à la localisation et au statut incertains (Odonata). Rev. fr. Ent. (N.S.) 3 (1): 34-36. (With Engl. s.). — (*Lab. d'Ent., Mus. Natn. Hist. Nat., 45 rue de Buffon, F-75005 Paris*).

The status and provenience of the type material of the following spp. are stated: *Enallagma elongatum* (Martin), *Bradinopyga cornuta* Ris, *B. subcancellata* Martin, *Macromia bifasciata* (Martin), *Sympetrum navasi* Lacroix, *Trithemis basitincta* Ris, *T. hecate* Ris, and *Zygonyx natalensis* (Martin). Lectotypes are designated for *M. bifasciata*, *S. navasi*, and *T. hecate*.

- (3225) MACHADO, A.B.M., 1981. Biologia de *Roppaneura beckeri* Santos, 1966, libélula cuja larva vive na água acumulada em folhas da umbelífera *Eryngium floribundum*. [Biology of *Roppaneura beckeri* Santos, 1966, a dragonfly whose larva lives in the water accumulated in the leaves of the umbelliferan *Eryngium floribundum*]. Re-

sum. Com. cient. 8 Congr. brasil. Zool., Brasília, pp. 41-42. (Port.). — (*Dept. Morfol., Inst. Cienc. Biol., Univ. Fed. Minas Gerais, C.P. 2486, BR-30000 Belo Horizonte, Minas Gerais*).

[Unabridged translation]: *R. beckeri* (Protoneturidae) breeds in the water which accumulates in the leaf axils of *E. floribundum* (cf. *OA* No. 3069). Observations were carried out (twice monthly, during 2 yr) in the area of Florestal, Minas Gerais, Brazil. In addition, detailed studies were performed on 70 plants, whose leaves were detached and examined for the presence of larvae, whose characteristics and position were recorded. The larvae were taken to the laboratory and measured; most of them having been reared in order to record the morphological changes after each molt. In all, 350 specimens were studied. — A medium size plant (60 cm diameter) has 20-25 leaves disposed in 6 layers, named A-F, from the inner to the outer layer, layer F consisting only of rotten leaves. The adults emerge always only on the underside of the leaves, most frequently on layers C (47%) and D (27%). Periodic counts of exuviae (in 25 plants) revealed that the emergence period extends from the second half of Aug. to late Jan: 2/3 of population emerging from late winter to early spring. This early emergence peak is unusual in the Brazilian Odon., and may possibly be correlated with the fact that soon after this season most of the plants die, thus rendering the emergence difficult for the lack of adequate leaf support. Males and females could be observed in the vicinity of plants until early Feb.; meeting pairs were frequently noticed. Immediately after copulation, the oviposition takes place; the female is not attended by the male. The eggs are deposited endophytically in the leaves, below the water level (60% in D, 36% in E). 16 plants examined contained 4-110 eggs (mean 46). Although a female deposits only 3-6 eggs in each leaf, it usually visits many plants. This behaviour should be understood as one of the mechanisms preventing over-oviposition per leaf or plant, allowing a uniform distribution of eggs throughout the

plant population. Experiments with marked larvae revealed that when overpopulation is artificially brought about in a plant, many larvae move into the neighbouring plant. Likewise, when the mother-plant dies, the larvae move into the young plants that bud in its place. The mean number of larvae per plant was 5-7 during May-Aug., increasing up to 10 in Nov., and reaching the maximum (13) in Feb. On the basis of head width, 13 larval stages were identified. The study of larval size and instar distribution (periodical sampling during 1 yr) indicates that *R. beckeri* completes a circle every 2 yrs. This rises the problem of the mechanisms regulating the coexistence, in a restricted habitat, of 2 populations of cannibalistic larvae of different sizes, and which is dealt with in *OA* No. 3226.

- (3226) MACHADO, A.B.M., 1981. Alguns aspectos de ecologia e do comportamento das larvas de *Roppaneura beckeri* Santos, 1966 (Odonata-Protoneturidae), com ênfase no estudo da territorialidade. [Some aspects of the ecology and behaviour of the larvae of *Roppaneura beckeri* Santos, 1966 (Odonata-Protoneturidae) with emphasis on the territoriality]. Resum. Com. cient. 8 Congr. brasil. Zool., Brasília, pp. 149-150. (Port.). — (*Dept. Morfol., Inst. Cienc. Biol., Univ. Fed. Minas Gerais, C.P. 2486, BR-30000 Belo Horizonte, Minas Gerais*).

With reference to the papers listed in *OA* Nos 3069 and 3225, the strategy is discussed, used by the larvae to maximize the resource utilization and to diminish cannibalism between the 2 populations (of different age and size) that coexist within the small space available per a plant. Due to the preferential oviposition (cf. *OA* No. 3225), the 1 and 2 instars are concentrated in layers D and E. The instars 3-8 are distributed throughout all the layers, with a tendency of concentration in C. From the 9th instar onwards, the larvae tend to migrate to the outer layers (D, E), 57% of the ultimate instars occurring in D. The physical conditions (temperature, pH), prevailing in the latter, do not differ significantly from those in the other layers, though

the volume on water is slightly larger (2.1 ml). It is believed that the higher food concentration (*Culex dolosus*, *C. machadoi*) is the principal factor causing the migration. Thus, the spatial distribution of the 2 populations inside the plant is resulting in a better adjustment to the available food resources, and diminishes the cannibalism of the larger on the smaller larvae. Laboratory experiments have shown that the 13th instars are still able to eat the 8th instars, but not the larvae of the 9th instar. It has been also experimentally that the larvae tend to stay for a long time in the same layer, but their migratory activity is stimulated by the lack of food. When 2 large larvae (instars 9-13) are placed together, one will always displace the other, often mutilating it. The large numbers of mutilated individuals found in the plants suggest that this behaviour occurs also under natural conditions. Experimentally it was shown that chasing is not conditioned by the lack of food. This indicates that at least instars 9-13 display a kind of territorial behaviour, each territory corresponding to the space filled with water in the axil. — (*Abstracter's Note*: The territoriality of *R. beckeri* larvae has been reported for the first time, by the same author, in 1977; cf. *OA* No. 1798. Recently territorial behaviour was observed also in 2 other zygopteran larvae; cf. e.g. *OA* Nos. 2782, 2996, 3209).

- (3227) MANCKE, R., 1981. Dragonflies. *Newsl. S. C. Mus. Comm.* 7 (1): 5. — (*South Carol. Mus. Commission, 2221 Devine Str., Room 300, P.O.B. 11296, Columbia, S. C. 29211, USA*).

A general note on Anisoptera, with reference to the recent catalogue of South Carolina, USA, anisopteran fauna (105 spp.), listed in *OA* No. 3201.

- (3228) OLBERG, R.M., 1981. Object- and self-movement detectors in the ventral nerve cord of the dragonfly. *J. comp. Physiol. (A)* 141 (3): 327-334. — (*Dept. Zool., Univ. Washington, Seattle, Wash. 98195, USA*). (1) Descending, movement-sensitive visual interneurons in the ventral nerve cord of the

dragonfly, *Anax junius*, fall into 2 categories, based upon their responses to a variety of stimulus patterns. One group (object-movement detectors) is sensitive only to movement of small patterns; the other (self-movement detectors) responds maximally to movement of very large patterns or to rotation of the animal in the lighted laboratory. — (2) Object-movement-detector responses to repeated identical stimuli habituate very rapidly. The habituation is region specific; patterns movement elsewhere in the receptive field elicits a renewed response. The habituation is very long lasting and is not subject to dishabituation by mechanical or visual stimulation. Self-movement detectors, in contrast, show little or no habituation. — (3) Increasing the extent of the stimulus pattern in the direction of motion decrease responses of object-movement detectors slightly and greatly increases self-movement-detectors responses. — (4) Increasing the length of the advancing edges perpendicular to the line of motion dramatically reduces object-movement-detector responses. Such increases enhance self-movement-detector response only slightly, unless they result in the pattern occupying especially sensitive regions of the receptive field. — (5) Over a wide velocity range, self-movement-detector responses are not dependent on pattern wavelength. — (6) These results indicate that the parameter upon which the object/world discrimination is based is different for the 2 groups of interneurons. The critical parameter for the self-movement detectors is the extent of the pattern in the direction of motion, whereas for the object-movement detectors, the critical parameter is the extent of the pattern perpendicular to the direction of motion. (Author).

- (3229) SCHLÜPMANN, M., A. SCHÜCKING & R. BLAUSCHECK, 1981. Der Kalksteinbruch Helmke (Iserlohn-Letmathe), als schützenswerter Lebensraum. Hohenlimburger Heimatsbl. 42 (3): 47-60. — (*Arbeitsgem. Naturschutz, Ver. Orts- u- Heimatk., Hohenlimburg, G.F.R.*).

Data on the flora and fauna of a limestone quarry nr Iserlohn, Northrhine-Westfalia, German Federal Republic, are compiled. *Coenagrion* sp., *Pyrrhosoma nymphula*, *Aeshna cyanea*, *Sympetrum flaveolum*, *S. sanguineum*, and *S. vulgatum* are the Odon. spp. listed for the locality.

- (3230) SELYSIA. A Newsletter of Odonatology. Compiled by M.J. Westfall & M.S. Westfall, Dept. Zool., Univ. Florida, Gainesville, Fla. Vol. 10, No. 1 (March 1, 1981). — Sent free of charge to all members of the International Odonatological Society and to anybody else expressing to the Editors the desire to receive it. — (c/o Dr. M.J. Westfall, Jr., Dept. Zool., Univ. Florida, Gainesville, Fla 32611, USA).
- Asahina, S. & K. Inoue* (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA): World odonatologists meet in Kyoto and Osaka, Japan (1-2); — *Bick, G.* (1928 S.W. 48th Ave, Gainesville, Fla 32608, USA): Inaugural meeting Odonata Specialist Group International Union Conservation of Nature and Natural Resources (IUCN) (2-3); — The origin of the Congress emblem (3); — Odonata conservation (4); — Sr. González visits Florida (4); — *Donnelly, T.W. & R.W. Garrison* (Partridge Lane, Binghamton, N.Y. 13903, USA): Collecting trip to Santo Domingo (4); — *Belle, J.* (Onder de Beumkes 35, 6883 HC Velp, NL): Orientation trip to Peru (4); — *Dunkle, S.W.* (c/o the Editors): Dunkle and Knopf blitz Ecuador and Columbia (5-6); — Gomphurus eggs (6); — Helocordulia and Gomphaeschna eggs needed (6); — *Tennessee, K.J.* (1949 Hickory Ave, Florence, Al. 35630, USA): Requests for loans of specimens (6-7); — *Westfall, M.* (address above): South American sabbatical (7-8); — (*Anonymous*): Symposium plans finalized (8); — Obituary [for Prof. V. Teyrovský] (8-9); — Annotated catalogue and bibliography of taxa introduced in Odonata from 1971 to 1980 (9); — *Westfall, M.J.* (address above): Cellophane envelopes for Odonata (9); — Second reprinting of dragonfly Manual by Needham and Westfall (9); — Editor's note

(9).

- (3231) STANGE, G., 1981. The ocellar component of flight equilibrium control in dragonflies. *J. comp. Physiol. (A)* 141 (3): 335-347. — (*Dept. Neurobiol., Res. Sch. Biol. Sci., Austral. Natn. Univ., P.O.B. 475, Canberra City, A.C.T. 2601, AU*)
The dynamics of light-evoked head reflexes in *Hemicordulia tau* is described under light conditions which were selected to optimally address the ocelli. — (1) The responses occur only during flight. — (2) Stimulation by a light positioned to address the median ocellus evokes a head movement around the pitch axis. The threshold is in the order of 10^7 photons \cdot cm $^{-2}$ \cdot s $^{-1}$. With increasing intensity, the responses become progressively faster but do not increase in amplitude. — (3) Stimulation by lights positioned to address the lateral ocelli evokes head movements around the roll axis with a similar threshold and similar dynamics as in the pitch responses. The responses are strongest when two sources at their side of the animal are switched in alternation. — (4) No evidence is found for interactions between the lateral and the median inputs. — (5) During sustained illumination from the median source, the head is tilted towards it indefinitely, and increasing the intensity causes only a small additional change of head position. Decreasing the intensity causes a large movement of the head away from the source, and then the system readapts rapidly and the head returns to the on-position (high pass filtering). If increment pulses are superimposed on a steady background, the magnitude of their effect is a function of both their duration and amplitude. — (6) If the median source is modulated by a square wave of a frequency above the high pass cut-off, the amplitudes of the responses are proportional to modulation depths and independent of average intensity over 4 log units. — (7) At intensities below 10^{11} photons cm $^{-2}$ s $^{-1}$, the spectral sensitivity has a maximum in the green, exceeding the UV-sensitivity by a factor of 5; at higher intensities the responses become more sensitive to

UV than to green (reverse Purkinje shift). It is suggested that the reverse Purkinje shift is a functional adaptation to optimize the detectability of the contrast between sky and ground both in dim light and in direct sunlight. — (8) The dynamics of the behavioural responses can be largely accounted for by known properties of the neuronal elements of ocellar systems. (Authors).

- (3232) STARK, J.D., 1981. Feeding relationships of aquatic fauna. *Newsl. N. Z. limnol. Soc.* 1981 (16): 22. — (*Dept. Zool., Univ. Canterbury, Christchurch-1, NZ*).
[Verbatim text on Odon.]: The presence of non-animal material in the faecal pellets of *Xanthocnemis* — normally considered as a strict predator — was recorded. This material was certainly almost ingested when striking at prey, or it was derived from gut contents of prey spp. Cladocerans and oligochaetans were common in the faeces of all size classes examined, and mites, caddisflies, and especially *Potamopyrgus* snails were of increasing importance.
- (3233) TOMBO. ACTA ODONATOLOGICA. Published by the Society of Odonatology, Tokyo. Vol. 23, Nos. 1/4 (dated Feb. 20, 1981). — Annual subscription/membership for individual bona fide odonatologists Y 2000. — (orders to be sent to the Treasurer, Dr. S. Eda, Dept. OralPathol., Matsumoto Dental Coll., 1780 Gobara, Hirooka, Shiojiri, Nagano, 399-07, JA), for libraries and institutions Y 4000. — (orders to be sent to the Japan Publication Trading Co., Central P.O.B. 722, Tokyo, JA). — (Mostly in Engl., Jap. papers with Engl. s's.). — (c/o Editor: Dr. S. Asahina, 4-4-24 Takadanobaba, Shinjuku-ku, Tokyo, 160, JA).
Eda, S. (address cf. above): Oviposition of *Somatochlora uchidai* (1, 2); — *Asahina, S.* (address cf. above): Records of little or unknown Odonata from Thailand incl. descriptions of *Microgompus thailandica* sp.n. and *Planaeschna chiengmaiensis* sp.n. (3-16); — *Young, A.M.* (Sect. Invert. Zool., Milwaukee Public Mus., 800 West Wells

Str., Milwaukee, Wisc. 53233, USA): Notes on the oviposition microhabitat of the giant tropical damselfly *Megaloprepus coerulatus* (Drury) (Zygoptera: Pseudostigmatidae) (17-21) [cf. also *OA* No. 3205]; — *Asahina, S.*: Odonatists' meetings associated with XVI Congress of Entomology, Kyoto, Aug. 3-9, 1980 (22); — *Inoue, K., S. Obana & Y. Fujiwara* (5-9 Fuminosato 4-chome, Abenoku, Osaka, 545, JA): Life history of *Aeschnophlebia longistigma* (23-27); — *Ueda, T.* (Dept. Zool., Fac. Sci. Kyoto Univ., Kyoto, 606, JA): In memoriam Mr. Masamichi Iwasaki (28); — *Andoh, T. & Y. Takasaki* (5-24 Otowa 1-chome, Ichinomiya, Aichi-ken, 491, JA): Observations on the breeding habitat of *Sympetrum flaveolum flaveolum* and *S. risi yosico* in Hokkaido, with the descriptions of their larval exuviae (29-33); — *Mitamura, T.* (c/o the Editor): New records of *Mortonagrion hirosei* from Saitama Prefecture (33); — *Arai, Y.* (3-72 Ishiwa, Kumagaya, Saitama Pref., 360, JA): Observations on the pairing act between *Orthetrum albistylum speciosum* and *O. triangulare melania* (34); — A case of triple-connection of *Lestes temporalis* (34); — *Sugimura, M.* (Higashishita-cho, Nakamura, Kochi Pref., 786, JA): Egg-laying behaviour of some Japanese dragonflies, 2 (35-38) [for pt. 1 cf. *OA* No. 2990]; — *Yamaguchi, M.* (Kasuga-cho 2-13, Nerima-ku, Tokyo, 176, JA): Occurrence of *Aeschnophlebia longistigma* at Asu, Hanno, Saitama Prefecture (38); — *Ishikawa, H.* (c/o the Editor): Three examples of triple-connection and two examples of hybridizing connection among Japanese Odonata (39-40); — *Aeschna juncea* newly recorded from Kanagawa and Tokyo (40); — *Kohama, T.* (95, Samashita, Ginowan, Okinawa Pref., 901-22, JA): Records of *Hydrobasileus* and *Brachydiplax chalybea flavovittata* from Okinawa Island, the Ryukyus (41); — A record of *Sympetrum cordulegaster* from Ishigaki Island, the Ryukyus (42); — *Watanabe, K.* (145-1, Maesato, Ishigaki, Okinawa Pref., 907, JA): — Note on the Odonata of the Yayeyama Islands. II. Season of the adults (43); — *Asahina, S.*: [A note on the

1980 Annual Meeting of the Society of Odonatology, Tokyo] (43); — *Eda, S.*: International Odonatologists' Evening Meeting, Kyoto, August 7, 1980 (44); — *Asahina, S.*: Additional to Thai Odonata records (45).

- (3234) **VAN DEN HURK, P.**, 1981. Libellen in Spanje. [Dragonflies in Spain]. Stridula 1981 (March): 17-23. (Dutch; volume and issue numbers not stated in the journal). — (*Borgesiuslaan 353, 9722 VG Groningen, NL*).
14 spp., collected at various localities in Granada and on the Guadalquivir River, Spain (July-Aug., 1980), are discussed. Of interest is the record of *Enallagma cyathigerum* from Pantano de Cubillas, N of Granada (alt. 900 m), which is said to be the southernmost locality of this sp. in Spain.
- (3235) **WATERSTON, A.R.**, 1981. Present knowledge of the non-marine invertebrate fauna of the Outer Hebrides. Proc. R. Soc. Edinb. (B) 79 (4): 215-321. — (*Royal Scottish Mus., Chambers Str., Edinburgh, EH1 1JF, UK*). This is a catalogue of Protozoa and Invertebrata known to occur in the Outer Hebrides, United Kingdom. Odon. are dealt with on pp. 236-237. 10 spp. have been so far recorded. *Coenagrion puella* requires confirmation, and *Lestes sponsa* and *Cordulegaster boltoni* are rare and local. The most common sp. is *Sympetrum nigrescens*. The others are: *Enallagma cyathigerum*, *Ischnura elegans*, *Pyrrhosoma nymphula*, *Aeshna juncea*, *Libellula quadrimaculata* and *Sympetrum danae* (= *scoticum*). (Cf. also *OA* Nos. 3095, 3096).
- (3236) **WOOTTON, R.J.**, 1981. Palaeozoic insects. Ann. Rev. Ent. 26: 319-344. — (*Dept. Biol. Sci., Univ. Exeter, Exeter, Devon, EX44PS, UK*)
[Verbatim text of the odon. section, pp. 327-328]: Protodonata and Odonata are closely related, and the Moscow school include the Protodonata in the Odonata as the Suborder Meganisoptera. Carpentier has defended separate ordinal status, again a matter of opinion. The principal characters that

separate these orders are the (plesiomorphic) absence from the protodonate wing of arculus, nodus, and pterostigma. The aerial predatory habit of both groups was established early, probably by the time of their first appearance. Carboniferous Meganeuridae (Protodonata) have massive mandibles and spiny, forward-directed legs; the very close parallelism in wing shape between Protodonata and large extant Anisoptera points to a similar mode of flight. No Palaeozoic larvae are known, so it is not certain that Protodonata and earliest Odonata had aquatic juvenils. — Protodonata: *Erasipteron larischii*, a hind wing of strikingly dragonfly-like shape, is known from the Namurian C of Czechoslovakia and is among the oldest insect fossils. Another *Erasipteron* species, known mainly from a fore wing, has been found in the Westphalian A of England. Later representatives include the largest insects known. This dramatic fact, combined with some atrocious early palaeontology, has led to widespread misrepresentation and fictional reconstruction. Carpenter has restudied the Commeny material on which most of the mythology is based. *Meganeura monyi*, the classic "giant dragonfly" is known only from poor body fragments and some pieces of wing that suggest a span of not less than 630 mm. No accurate reconstruction is possible from existing material. Knowledge of the protodonate body comes mainly from the smaller Commeny insect *Meganeura selysii*. Protodonata are known from other Carboniferous localities in the USA and Britain, and particularly in the L. Permian of Kansas and Oklahoma, where they show a considerable size range. *Meganeuropsis permiana*, from Kansas, may have had a span of 710 mm — larger than *Meganeura monyi* — but other wingspans were as low as 150 mm, within the range of modern Odonata. *Erasipterosa larischii* would have been still smaller, with a span of ca 130 mm.

Protodonata are recorded from the U. Permian of European Russia and may have continued into the Mesozoic. — Odonata: True Odonata appear in small numbers in the L. Permian of Kansas, Oklahoma, the Kuzbass, and the Urals. They fall into two categories: early Zygoptera (usually referred to a separate but unnecessary Suborder Protozygoptera) and Protanisoptera. The Zygoptera show from the first the slender petiolate wings that characterize many extant forms, and they probably flew and behaved in a similar fashion. Protanisoptera had broader-based wings, in shape resembling those of small true Anisoptera, but with a more distal nodus. In both lineages the parallel evolution of the nodus and arculus may be followed. There has been disagreement whether the Anisozygoptera/Anisoptera arose from zygoterous stock in the Mesozoic or directly from Protanisoptera. If the latter is true, the lines leading to the two surviving suborders were already separate in the L. Permian, and one may conclude that the aquatic habit, the mask, and other larval characters that they share were also established. Most known Permian Odonata were small. The Oklahoma zygoterous *Progoneura nobilis*, with a span of less than 30 mm, is among the smallest Odonata of any age. The difference between this and *Meganeuropsis* is enormous: odonatoids were able to exploit insect food over a considerable size range. Zygoptera and Protanisoptera are also known from the U. Permian of European Russia, Australia, and the Falkland Islands.

- (3237) ZÜRCHER LIBELLENFORUM. Compiled by H. Schiess (*Brüglenstr. 1, CH-8345 Adetswil*). Nos. 5, 6 (Feb., 1981). (No. 5): Schiess, H.: "Kritische Arten" (1-2), with an appendix: Vorschlag für Liste "Die Kritische Arten"; — (No. 6): Schiess, H.: Anleitung zum Libellen-Praeparieren (1-2).