

ODONATOLOGICAL ABSTRACTS

1971

- (3339) BHADURI, J.L., K.K. TIWARI & B. BISWAS, 1971. Zoology. *In*: D.M. Bose, S.N. Sen & B.V. Subbarayappa, [Eds], A concise history of science in India, pp. 403-444, 616-660 (ref.), Indian Natn. Sci. Acad., New Delhi. — (Authors' addresses not stated).

On p. 444, a reference is made to the 'dragonfly' as mentioned in the ancient Tamil Sangam literature. — (*Abstracter's Note*: Neither the quotation of the Tamil source, nor the original expression for 'dragonfly' are given. The statement is apparently based on the review paper by H.S. Rao, 1957, J. Bombay nat. Hist. Soc. 54: 251-280, pls 1-2. — The dating of the Śāṅgam literature is still uncertain; it was composed in the early centuries of the Christian era. — The Tamil expression for 'dragonfly' is 'tumbi', 'tumb' meaning something that is curved or bent (like e.g. an elephant's tusk), and 'i' is a suffix, denoting the condition of 'having something').

1972

- (3340) CLAUSNITZER, H.-J., 1972. Die Odonaten im Naturpark Südheide (Umgebung Celle). *Ent. Z., Frankfurt* 82 (20): 236-240. — (Südstr. 6, D-3106 Eschede, GFR). 46 spp. are listed and their occurrence in the Celle area, Lower Saxony, German Federal Republic is briefly discussed.
- (3341) PAINA, I., 1972. Lista speciilor de insecte

colectate de participantii la cursul de specializare tinut in jud. Bacău in perioada 6-14 iunie 1971. [A list of insects species collected by the participants in the specialization cours in Bacău, held June 6-14, 1971]. *Studii Com. Muz. Stii. nat. Bacău* 5: 327-334. (Rumenian). — (Author's address not stated).

9 zygopteran spp. are listed from the city of Bacău, Romania.

- (3342) WOOTTON, R.J., 1972. The evolution of insects in fresh water ecosystems. *In*: R.A. Clark & R.J. Wootton, [Eds], Essays in hydrobiology, pp. 69-82, Univ. Exeter.

— (Dept. Biol. Sci., Univ. Exeter, Exeter, Devon, EX4 4PS, UK).

On p. 71, there is a brief review of the more important fossil records of Odon., incl. a reference to a libelluloid forewing of the Upper Jurassic age of Spain, published here for the first time.

1974

- (3343) MEHTA, S., 1974. *A study on wing venation of some Indian dragonflies (Anisoptera: Odonata), evolution and relation to taxonomy of the group*. Ph. D. thesis, Univ. Agra. — (Dept. Zool., Agra Univ., Agra, U.P., India). [Not available for abstracting].

1976

- (3344) HALKKA, L. & O. HALKKA, 1976. The fate of a gene product body in the oocytes

of *Cordulia aenea* L. (Odonata). *Hereditas* 84: 242 [Abstract only]. — (Dept. Genet., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki-10, Finland).

Text identic to that listed in *OA* No. 1623.

- (3345) JARZEMBOWSKI, E.A., 1976. Insect fossils from the Wealden of the Weald. *Proc. Geol. Ass. Lond.* 87 (4): 443-446. — (Dept. Ent., Brit. Mus., Nat. Hist., Cromwell Rd., London SW7 5BD, UK). Several odon. specimens, without names and descriptions, are mentioned from 2 Wealdian (continental Lower Cretaceous) localities in Britain.

- (3346) LAUNAY, H. & P. RAZET, 1976. Appareil excréteur et excrétion azotée chez quelques odonates armoricains. *Bull. Soc. zool. Fr.* 101 (5): 1079. — (Lab. Parasit., Fac. Med., av. Prof.-Léon-Bernard, F-35043 Rennes). The morphology of the Malpighian system in the representatives of Platycnemididae, Coenagrionidae, Lestidae, Calopterygidae, Gomphidae, Aeshnidae, Cordulegasteridae, Corduliidae and Libellulidae is briefly summarized. Save for the Aeshnidae, it is uniform throughout the Order. The nitrogen excretion was studied in larvae and adults of *Aeshna cyanea*: uric acid, urea and NH_4OH are being excreted simultaneously. Urase has a higher activity in adults than in larvae. Studies on nitrogen excretion in connection with ecology and life-history of other spp. are in progress.

1977

- (3347) ARAI, Y. & K. ITOH, 1977. [Social behaviour of *Mnais pruinosa*. II]. *Kanagawa-chuho* 51: 1-2. (Jap.). — (3-72, Ishiwara, Kumagaya, Saitama Pref., 630, JA). [Abstract not available]. For pt 3 cf. *OA* No. 3350.
- (3348) ROOS, P., 1977. Über wenig beachtete Insektengruppen. I. Baustein zu einer Odonatenfauna Westfalens. *Mitt. westf. Entomol.* 1 (1): 4-5. (Schmidtstr. 23, D-4630 Bochum-1, GFR).

8 spp. are listed from various localities in the Ruhr area, Westfalia, German Federal Republic. (Cf. also *OA* No. 3377).

- (3349) SCHALLER, F., 1977. Rôle de la température dans le développement d'*Aeshna cyanea* Mull. (Insecta: Odonata): recensement des stades larvaires d'un biotope sur une période de quatre ans. *Bull. Ass. philomath. Als. Lorr.* 16: 21-28. — (Lab. Biol. gén., Univ. Louis Pasteur, 12 rue de l'Université, F-67000 Strasbourg).

The census of a larval population of *A. cyanea* has been studied in a defined biotope from late summer to early autumn. The highly variable environmental temperature conditions, prevailing during this season, exercise a strong influence as to the developmental stage of the larvae destined to undergo diapause. A strict correlation was noticed between the Aug-Oct temperatures and the instar pattern of the population at the end of this period. The predominance of I of the 3 instars preceding the ultimate instar is related to the milder/harsher temperature conditions. It is exceptional that diapause should occur at the ultimate instar. The respective roles of temperature and photoperiod during the postembryonic development are discussed. (Author).

1978

- (3350) ARAI, Y., 1978. [Social behaviour of *Mnais pruinosa*. III]. *Kanagawa-chuho* 54: 9-13. (Jap.). — (3-72, Ishiwara, Kumagaya, Saitama Pref., 360, JA). [Abstract not available]. For pt 2 cf. *OA* No. 3347.
- (3351) HEALY, A. & C. SMITHERS, 1978. *Australian insects in colour*. Reed Pty, Sydney-Wellington-London. 112 pp. Price: AU \$ 6.95. (Publishers: 53 Myoora Rd., Terrey Hills, Sydney, AU). A picture book dealing with Odon. on pp. 15-17. General text is accompanied by colour photographs of *Aeshna brevistyla*, *Ischnura aurora* and *Hemicordulia tau* (head only).

- (3352) PARKER, D.M., 1978. Survey of dragonflies (Odonata) in Herefordshire, 1977. *Trans. Woolhope Nat.Fld Club* 42 (3): 221-227. — (Dept. Bot., Univ. Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK). 14 spp. recorded (Apr.-Sep., 1977) from Herefordshire Co., W. Midlands, England are listed and discussed. Their distribution is mapped and suggestions are made as to the conservancy management of the local habitats.
- (3353) PRASAD, M., 1978. Studies on the male accessory genital structures of *Neurothemis fulvia* (Drury), *Neurothemis intermedia intermedia* (Rambur) and *Neurothemis tullia tullia* (Drury) from Western Himalaya (Odonata: Libellulidae Smpyetrinae). *Bull. zool. Surv. India* 1 (1): 87-90. — (Zool. Surv. India, 14 Madan Str., Calcutta-700072, India).
The said structures are described, illustrated and discussed, and the 3 spp. are keyed.
- (3354) SCHLEE, D., 1978. Bernsteine und Bernstein-Fossilien. *Stuttgart. Beitr. Naturk.* (C) 8: 72 pp., 16 col. pls excl. — (Abt. Stammesgesch. Forsch., Staatl. Mus. Naturk. Stuttgart, Zweigstelle Ludwigsburg, Arsenalplatz 3, D-7140 Ludwigsburg, GFR).
The petrography, stratigraphy and palaeontology of the Amber deposits of the world are reviewed and discussed, and an exhaustive bibliography on the subject is given. The odon. are mentioned from the Baltic (Lower Oligocene) and the Dominican (Oligocene) deposits only.
- 1979**
- (3355) (Anonymous), 1979. [At the meeting of the Kanto Branch of the Entomological Society of Japan, April 27, 1979]. *Nature and Insects* 14 (7): 29-31. (Jap.).
The article is a brief summary of the lecture, "A new insect classification, based on the fossil evidence", given at the said meeting by Dr A.G. Ponomarenko, USSR. A photograph of this well-known Russian palaeontologist and palaeocoleopterologist is also included. Among the insect illustrations are of interest Ponomarenko's original reconstructions of *Arctotypus* sp. (Fig. 5), *Hemeroscopus baissicus* Prit., imago (Fig. 7), and the same, larva (Fig. 8). — (Cf. *OA* Nos 3248., 3274, 3276).
- (3356) ABRAHAM, M., 1979. Studies on the bottom macro-fauna of Bhavanisagar reservoir (Tamil Nadu). *J. Inland Fish. Soc. India* 11 (2): 41-48. — (Central Inland Fish. Res. Inst., Bhavanisagar, Tamil Nadu, India).
The distribution and abundance of benthos of Bhavanisagar, an impoundment on the confluence of the Bhavani and Moyar tributaries, Cauvery River, Tamil Nadu, southern India, were studied. Samples were collected at 2-20 m depths, but the zygopteran larvae (not identified) are said to occur at the depth of 4 m only.
- (3357) ASAHINA, S., 1979. [My souvenirs entomologiques. Pt. 1. Primary school boyhood]. *Nature and Insects* 14 (5): 15-19. (Jap.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160 JA).
Autobiography of the doyen of the Japanese odonatologists; with photographs.
- (3358) EDA, S., 1979. [Odonatology in 1978 and the perspective for 1979, with an appendix on the annual meeting of the Society of Odonatology, Tokyo]. *Nature and Insects* 14 (4): 17-21. (Jap.). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
A chronicle of the main Japanese achievements, with a group photograph of the participants in the annual meeting of the Tokyo society.
- (3359) KAWAGUCHI, S., 1979. [Dragonfly fauna of the Kujiragaik Pond and the surroundings, Shizuoka]. *Nature and Insects* 14 (4): 10. (Jap.). — (2-16. Ohte-machi, Shizuoka, 420, JA).
A list and phenological data are given for 29 spp. (Japanese names only).
- (3360) KOBAYASHI, F., 1979. [A new locality of *Aeschnophlebia longistigma* in Gumma

- Prefecture]. *Nature and Insects* 14 (2): 32. (Jap.). — (1624-20, Oaza Hirakata, Koshigaya, Saitama Pref., 343, JA).
The sp. was noticed in good numbers at the Morinji-numa bog and in the adjacent marshes of the Tatebayashi area, Gumma Prefecture.
- (3361) KOBAYASI, F., 1979. [Early summer dragonflies from the Oppe River, Saitama Prefecture]. *Nature and Insects* 14 (2): 32. (Jap.). — (1624-20, Oaza Hirakata, Hoshigaya, Saitama Pref., JA).
The spp. listed are: *Calopteryx virgo japonica*, *Nihonogomphus viridis*, *Onychogomphus viridicostus*, *Sinogomphus flavolimbatus*, *Stylogomphus suzukii*, *Macromia a. amphigena*, and *Orthetrum albistylum speciosum*.
- (3362) MATSUKI, K., 1979. [A description of the larva of *Sympetrum eroticum ardens*]. *Nature and Insects* 14 (8): 19. (Jap.). — (3-75-17, Nakadori, Tsurumi-ku, Yokohama, 230, JA).
Descriptive notes, with a figure of the labium.
- (3363) MATSUKI, K., 1979. [The behaviour of *Cercion c. calamorum*]. *Nature and Insects* 14 (10): 4-13. (Jap.). — (3-75-17, Nakadori, Tsurumi-ku, Yokohama, 230, JA).
A detailed study of the territorial and sexual behaviour.
- (3364) MATSUKI, K., 1979. [A note on the flight of the mature male of *Sieboldius deflexus* (Chao)]. *Nature and Insects* 14 (14): 19. (Jap.). — (3-75-17, Nakadori, Tsurumi-ku, Yokohama, 230, JA).
At Shihing, Taipei Hsien, Taiwan, July 19, 1979, a peculiar, wave-like flight was repeatedly performed by a territorial male. It was quite different from the usual gomphid flight, and it is here described in detail.
- (3365) MURAKI, K., 1979. [Dragonfly fauna of the Bangaike Pond, Kurono, Gifu]. *Nature and Insects* 14 (8): 23-27. (Jap.). — (3-25-3-306, Takadono, Asahi-ku, Osaka, 535, JA).
26 spp. are listed along with some notes on reproductive behaviour, and the development (1972-1978) and phenology of the fauna are discussed.
- (3366) NICHOLLS, S.P., 1979. A survey of the dragonflies of Gloucestershire with notes on their distribution and habitats. *Proc. Bristol Nat. Soc.* 37 (1977): 105-115. — (Dept. Zool., Univ. Bristol, Woodland Rd, Bristol, UK).
The fauna of Gloucestershire, England (23 spp.) is listed, mapped and discussed. The paper is based on the 1977 preliminary survey, but the pre-1977 data (from various sources) are also included.
- (3367) ŌKŌCHI, H. & T. ŌKŌCHI, 1979. [Some dragonfly records from Chiba prefecture]. *Nature and Insects* 14 (14): 10-11. (Jap.). — (21-13, Oshima-cho 8-chome, Koto-ku, Tokyo, 136, JA).
Oligoaeschna pryeri and *Aeschnophlebia anisoptera* were taken at Mobara, the latter also at Yokoshiba-machi, both in Chiba Prefecture.
- (3368) ŌKŌCHI, T., 1979. [A northern range limit record of *Macromia daimoji*]. *Nature and Insects* 14 (14): 10. (Jap.). — (21-13, Oshima-cho 8-chome, Koto-ku, Tokyo, 136, JA).
2 spec. are recorded from resp. Motegi-machi, Tochigi Pref. (June 15, 1974), and from Shirakawa, Gumma Pref. (Aug. 13, 1975), Japan.
- (3369) ŌKŌCHI, T. & [the] KASAI ODONATOLOGICAL SOCIETY, 1979. [Dragonfly fauna of the eastern three Ku of Tokyo. I]. *Nature and Insects* 14 (8): 18-19. (Jap.). — (21-13, Oshima-cho 8-chome, Koto-ku, Tokyo, 136, JA).
36 spp. incl. *Ceriagrion nipponicum*, *Libellula angelina* and *Tramea virginia* are recorded from Koto-ku, Tokyo. For pt 2 cf. OA No. 3370. — (*Abstracter's Note*: The Kasai Odonatological Society is a small, informal amateur club; the office address is

that of the first author).

- (3370) ŌKŌCHI, T. & [the] KASAI ODONATOLOGICAL SOCIETY, 1979. [Dragonfly fauna of the eastern three Ku of Tokyo. II]. *Nature and Insects* 14 (11): 26-28. (Jap.). — (21-13, Oshima-cho 8-chome, Koto-ku, Tokyo, 136, JA).
43 spp., incl. *Mortonagrion Hirosei*, *Aeshnophlebia longistigma*, a supposed hybrid *Anax parthenope julius* × *A. n. nigrofasciatus* and *Libellula angelina* are recorded from Edogawa-ku, and 36 spp., incl. *M. Hirosei*, *Coperia tokyoensis*, *Stylurus nagoyanus* and *Aeshnophlebia anisoptera* are recorded from Katsushika-ku. (For pt I cf. No. 3369).
- (3371) OKUMA, M., 1979. [Dragonfly fauna of Jionji and the vicinity, Iwatsuki, Saitama Prefecture]. *Nature and Insects* 14 (8): 12. (Jap.). — (12-27, Hommachi Kazo, Saitama Pref., 347, JA).
18 spp. are listed along with locality data and capture dates.
- (3372) SASAJI, H., 1979. [A record of *Planaeschna milnei* from Fukui Prefecture]. *Nature and Insects* 14 (2): 24. (Jap.). — (Author's address not stated).
A female taken July 28, 1978.
- (3373) SCHWARZ, U., 1979. Das Naturschutzgebiet Mürgelbrunnen in Dettingen-Wanggenried. *Jb. Oberaargau* 1979: 183-208. — (Author's address not stated).
A list is given of 17 odon. spp. recorded from the nature reserve Mürgelbrunnen, canton Solothurn, Switzerland. Among these, *Cordulegaster bidentatus* and *Epitheca bimaculata* are of local interest.
- (3374) SHIRASAWA, R., 1979. [Dragonfly records from Ohmachi, Nagano Prefecture]. *Nature and Insects* 14 (11): 29-30. (Jap.). — (6305-3, Shin'ei-cho, Ohmachi, Nagano Pref., 398, JA).
pp. are listed along with the locality data and capture dates.
- (3375) SONEHARA, I., 1979. [A note on the attempt at artificial colonization of three dragonfly species in some ponds of the Matsumoto area]. *Nature and Insects* 14 (14): 22-23. (Jap.). — (Tazawa 5035, Toyoshina-machi, Minamiazumi-gun, Nagano Pref., 399-82, JA).
None of the 3 spp. has been previously known from the area. The colonization was attempted by introducing substantial numbers of eggs and early larval instars into some ponds. *Epitheca bimaculata sibirica* successfully colonized the new habitats; since 1971 it is regularly seen in the area (June-July). *E. marginata* was evidenced by 6 exuviae only in 1975 (May), while *Aeshna mixta* definitely does not breed there.
- (3376) SONEHARA, I., 1979. [A record correction]. *Nature and Insects* 14 (14): 23. (Jap.). — (Tazawa 5035, Toyoshima-machi, Minamiazumi-gun, Nagano Pref., 399-82, JA).
A corrective note on the Kitamimaki-Pond record of *Aeshna mixta* (should read *Minami-mimakigahara*), Nagano Pref., Japan (cf. Shimizu, A. & K. Tatsuno, 1965, *New Insect* 9 (24): 1-13).
- (3377) VON HAGEN, H. & P. ROOS, 1979. Über Libellen und ihre Lebensräume im südlichen Ruhrgebiet. *Mitt. westf. Entomol.* 3 (3): 27-30. — (Akazienweg 23, D-5810 Witten, GFR).
17 spp. are listed from various localities in the vicinity of the city of Bochum, Westfalia, German Federal Republic. (Cf. also *OA* No. 3348).
- (3378) YAMAGUCHI, H., 1979. [First record of *Ischnura asiatica* from Obihiro, Hokkaido]. *Nature and Insects* 14 (1): 35. (Jap.). — (27-9, Minami 2-chome, Nishi 20-jo, Obihiro, 080-24, JA).
A series of both sexes is recorded (Sep. 17, 1978).
- (3379) YAMAGUCHI, H., 1979. [Records of *Epopthalmia elegans* at Tokachi, Hokkaido]. *Nature and Insects* 14 (8): 12. (Jap.). — (27-9, Minami 2-chome, Nishi 20-jo, Obihiro, 080-24, JA).

Various specimens, taken in July 1976 and 1978, are listed.

- (3380) YAMAGUCHI, H., 1979. [Records of *Somatochlora clavata* from Obihiro and the surroundings]. *Nature and Insects* 14(8): 33. (Jap.). — (27-9, Minami 2-chome, Nishi 20-jo, Obihiro, 080-24, JA).
Various records (July-Aug., 1977-1978) from the Obihiro area, Hokkaido are given.

1980

- (3381) (Anonymous), 1980. Suomen hydroentomologiien osoitteet ja erikoisalut — Finlands hydroentomologers adresser och specialområden. (The addresses and fields of interest of the hydroentomologists in Finland). *Notul. ent.* 60: 1-4. (Finnish & Swedish, with Engl. title).
The list contains the addresses of 5 Finnish odonatologists, viz. E. Huttunen (cf. *OA* No. 2476), M. Hämäläinen (cf. *OA* No. 3428), J. Kuusinen (cf. *OA* No. 3033), P. Valtonen (cf. *OA* No. 3143), and V. Varis (Eläinmuseo, P. Rautatiekatu 13, SF-00100 Helsinki-10).
- (3382) ALEXANDER, D.E., 1980. Wingbeat asymmetry associated with turning in dragonflies (Odonata: Insecta). *Am. Zool.* 20 (4): 894 [Abstract only]. — (Dept. Biol., Duke Univ., Durham, NC, USA).
[Verbatim]: Several odon. spp. were flown in a wind tunnel in order to study their wingbeat pattern. *Tramea carolina* and *Libellula incesta* were the spp. that flew longest and most steadily. When the dragonflies were forced to turn or allowed to turn freely, high-speed photographs show asymmetry between the wingbeat pattern of the left and right pairs of wings. Dragonflies can vary the amount of pronation and supination, and the wingbeat amplitude of contralateral wings. A given insect can use either type of asymmetry or both at once to control a turn. This behaviour indicates that dragonflies in flight turn by using the unbalanced forces caused by beating contralateral wings asymmetrically.
- (3383) BOON, L., 1980. Libellen, waargenomen in de bosvijver Birkhoven [Dragonflies of the Birkhoven forest pond]. *Natuur Landsch. Milieu Amersfoort* (2): 1-10. (Dutch). — (Author: Ringweg Randenbroek 73 C, Amersfoort, NL; — Copies available free from the publisher: c/o V. van Laar, Afd. Welzijnzaken, Gemeente Amersfoort, Stadhuisplein 1, 3811 LM Amersfoort, NL). The fauna of the pond (13 spp.; Amersfoort, Utrecht prov., Netherlands) is listed and discussed, and some conservancy measures are suggested.
- (3384) DE EGUILLEOR, M., R. VALVASSORI & G. LANZAVECCHIA, 1980. Discontinuity of sarcoplasmic reticulum in the mid-sarcomere region in flight muscle of dragonflies. *Tissue & Cell* 12(4): 749-759. — (Third author: Ist. Zool., Univ. Milano, Via Celoria 10, I-20133 Milano).
The sarcoplasmic reticulum organization of adult *Aeshna mixta* and *Anax imperator* flight muscles is analyzed, with particular reference to the doubling existing at H-band level. This doubling could be explained as a consequence of a regular discontinuity in the sarcoplasmic reticulum covering myofibrils. In each sarcomere, 2 sleeves of the sarcoplasmic reticulum seem to overlap, forming a telescopic system which can slide out during the lengthening and shortening movements of the fiber. (Authors).
- (3385) HALKKA, L., 1980. *Accumulation of gene products in the previtellogenic oocytes of the dragonfly Cordulia aenea: an ultrastructural and cytochemical study.* Acad. Diss., Univ. Helsinki. [ISBN 951-99285-2-9]. 253 pp. + 22 pls + reprints from *Science* 162 (1968): 803-805, *Z. Zellf.* 94 (1969): 534-541, *J. Cell Sci.* 19 (1975): 103-115 [*OA* No. 1313], 26 (1977): 217-228 [*OA* No. 1978]. (With Finnish s.). — (Dept. Genet., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki-10, Finland).
The larval development of *C. aenea* in Finland takes 3 yrs (14 instars), with hibernation at the 6th, 10th and 14th instars. Only the diapause of the 3rd hibernation is obligatory

and cannot be experimentally avoided. — Production and accumulation of maternal RNAs were studied in previtellogenic oocytes by means of cytochemical and histochemical stainings, autoradiography, electron microscopy and cinemicrography. —

(1) In the oocyte nucleus, the primary nucleolus was the producer of ribosomes, the secondary nucleolus probably took part in the production of soluble (5S) RNA. Several types of smaller nuclear bodies were found, some of which took part in the function of the primary nucleolus (lamellate bodies, fibrillar nuclear bodies). Some others were found to make associations with the secondary nucleolus (granular nuclear body, dotted nuclear body), or represented active chromosome areas (annular nuclear bodies, nuclear nodules, perichromatin granule aggregates). — (2) In the oocyte cytoplasm, a vast amount of ribosomes was reserved as monosome mass or ribosome whorls. The RNAs transported from the nucleus in the form of nuclear extrusions were segregated into several types of RNP-containing storage structures, each having a specific function during oogenesis or embryogenesis. The following structure-function relationships were proposed: dense masses — tubulin mRNA storage and tubulin synthesis; granulatubular masses — tubulin storage and polymerization; nematosomes — development of mitochondria and determination of germ line; cytosome-RNP — development of cytoplasmic membrane elements. — (3) The seasonal changes in temperature had a strong effect on the activity and ultrastructure of the RNA-producing and storing elements. The change in hormonal balance associated with the obligatory diapause induced considerable structural and functional changes in oocytes, and oogenesis proceeded to vitellogenesis proper. These change processes were preceded by structural modifications in certain RNP storage elements (cytosome-RNP, nematosomes). It is proposed that these RNP structures contain elements sensitive to hormone action, and take part in the direction of intracellular developmental

processes, e.g. on the translational level. Activities of the enzymes cAMP phosphodiesterase, thiamine pyrophosphatase and adenosine triphosphatase were found in these RNP elements, as well as in the active chromosome areas and in some of their products. These enzymes may be involved in the hormone action in these RNP-containing structures.

- (3386) HANDA, S.M. & H.N. BATRA, 1980. Cytology of ten species of dragonflies (Anisoptera: Odonata). *Proc. 67th India Sci. Congr.* (3): 103. — (Dept. Zool., Panjab Univ., Chandigarh-160014, India). $2n = 25$, XO is reported in *Acisoma p. panorpoides*, *Brachydiplax sobrina*, *Diplacodes trivialis*, *Neurothemis t. tullia*, *Orthetrum glaucum*, *O. taeniolatum*, *O. t. triangulare*, *Palpopleura s. sexmaculata*, *Tholymis tillarga*, and in *Trithemis festiva*. The provenience of material is not mentioned, and it is stated that the chromosomes are monokinetic in all spp.
- (3387) HANDA, S.M. & N. KOCHHAR, 1980. Cytology of eight species of damselflies (Zygoptera: Odonata). *Proc. 67th India Sci. Congr.* (3): 104. — (Dept. Zool., Panjab Univ., Chandigarh-160014, India). $2n = 23$, XO is reported in *Rhinocypha unimaculata*, $2n = 25$, XO in *Calicnemia miles* Laidl., $2n = 28$, neo-XY in *Agriocnemis pygmaea*, and $2n = 27$, XO in *Ceriagrion coromandelianum*, *Enallagma parvum*, *Ischnura delicata*, *Pseudagrion rubriceps*, and in *Rhodischnura nursei*. The chromosomes are said to be metacentric in all spp. — (*Abstracter's Note*: The provenience of material is not stated. If it originates from Panjab, the *Calicnemia* sp. is certainly not *C. miles*).
- (3388) LIM, R.P., 1980. Limnological research and education with reference to natural ecosystems in Malaysia. *Proc. 1st Workshop Promot. Limnol. Developing Countries, Kyoto*, pp. 57-65. — (Dept. Zool., Univ. Malaya, Kuala Lumpur, Malaysia). The status of taxonomic research on various

- aquatic taxa in Malaysia (incl. Odon.) is stated and the main bibliographic references are given for each group. A classification of the Malaysian streams into 5 habitat categories with respect to their odon. fauna using the Index of Similarity is outlined. It is based on the unpublished PhD thesis of J.I. Furtado (1966), listed in *OA* No. 3068.
- (3389) MACHADO, A.B.M., 1980. [published 1981]. *Helveciagrion* n.g., com descrição de uma nova espécie de Parque Estadual do Rio Doce, Minas Gerais (Odonata Coenagrionidae). [*Helveciagrion* gen. nov., with the description of a new species from the State Park of Rio Doce, Minas Gerais (Odonata Coenagrionidae)]. *Lundiana* 1: 59-87. (Port., with Engl. s.). — (Dept. Morfol., Inst. Cienc. Biol., Univ. Fed. Minas Gerais, C.P. 2486, BR-30000 Belo Horizonte). The new genus includes *Skiallagma simulacrum* (Calv.), *Acanthagrion chirihuanum* (Calv.) and *Helveciagrion vulcanoae* sp.n. The latter is the genotype (holotype ♂: Lagoa Terceira, VI-1959, allotype ♀: Lago Dom Helvécio, 18-V-1980, various paratypes of both sexes from both localities; holotype in author's coll.). A key for the 3 taxa of the new genus is also provided along with figs and scanning electron micrographs.
- (3390) MAKINO, S., 1980. [Notes on *Epiophlebia superstes*]. *Collect. & Breed. [Saysiu to Siiku]* 42 (4): 200-203, 207 (Jap.) — (Author's address unknown). [Not available for abstracting].
- (3391) MATHAVAN, S., J. MUTHUKRISHNAN & G.A. HELEENAL, 1980. Studies on predation on mosquito larvae by the fish *Macropodus cupanus*. *Hydrobiologia* 75: 255-258. — (Sch. Biol. Sci., Madurai Kamaraj Univ., Madurai-625021, India). With reference to the paper listed in *OA* No. 2579 it is emphasized that in both the fish (*Macropodus*) and the larval dragonfly (*Mesogomphus*) the temperature significantly influences the satiation time only in the smaller size-class predators.
- (3392) PAVLYUK, R.S., 1980. K fenologii strekoz Zapadnoy Lesostepi. [On the dragonfly phenology of the Western Forest-steppe]. *Tez. Dokl. 2 S'ezd. Ukrain. ent. Obshch., Uzhgorod* (Issled. po entomol. i akarol. na Ukraine), pp. 51-52. (Russ.). — (Dept. Invert. Zool., Lvov Univ., 4 Shchrbakov Str., USSR-290005 Lvov). Due to the variability of climatological conditions in the Western Forest-steppe, Ukraine, USSR, the dragonfly flight season also varies greatly in different years. The variation in the dates of the first appearance of adults in the spring is particularly pronounced in those spp. that might hibernate at the ultimate or penultimate stage. Usually, in the first decade of May 10 spp. are on the wing, there are up to 48 in the first decade of July, only 20 late in Sept., and 3-5 late in Oct. *Sympetrum striolatum* and *S. vulgatum* are on the wing even when the night temperatures drop down to -8 and -6° respectively.
- (3393) POLISHCHUK, V.V., V.S. TRAVYANKO, T.T. TAVOLZHANOV & G.V. KOBENEK, 1980. Fauna bespozvonochnyh vodoemov Pripyatskogo Poles'ya i ee izmeneniya pod vliyaniem melioracii. [The invertebrate fauna of the Pripyatsk Polesie water basins, and its changes caused by land-reclamation]. *Tez. Dokl. 2 S'ezd. Ukrain. ent. Obshch., Uzhgorod* (Issled. po entomol. i akarinol. na Ukraine), pp. 55-56. (Russ.). — (Inst. Hydrobiol., Ukrain. Acad. Sci., 44 Vladimirska Str., USSR-252003 Kiev). *Erythromma najas*, *Nehalennia speciosa*, *Lestes dryas* and *Cordulia aenea* are among the prevailing odon. spp. in the marshlands of the Pripyatsk Polesie, Ukraine, USSR.
- (3394) SEMUSHIN, R.D., 1980. O hishchnikah krovososushchih moshek (Diptera, Simuliidae) Donbassa. [On the predators of Simuliidae in the Donbas (Diptera)]. *Tez. Dokl. 2 S'ezd. Ukrain. ent. Obshch., Uzhgorod* (Issled. po entomol. i akarinol. na Ukraine), pp. 201-202. (Russ.). — (Dept. Biol., Donetsk Univ., Ul. Universitetskaya 24, USSR-340055 Do-netsk).

The larvae of *Calopteryx splendens* are reported as predators of the simuliid larvae and pupae in the Krasnaya-, Nizhniya Krynka- and the Derkul Rivers, Ukraine, USSR.

(Czech). — (Author's address not stated). The ultimate larval stages of the Czechoslovak spp. are keyed and figured.

1981

- (3395) TRUEMAN, E.R., 1980. Swimming by jet propulsion. *Semin. Ser. Soc. exp. Biol. Cambridge 5* (Aspects of animal movement): 93-105. — (Author's address not stated). The subject is briefly reviewed, and it is stated that the performance of *Aeshna cyanea* larvae compares well with cephalopods, though the latter may have a greater capacity for sustained swimming.
- (3396) WHITE, T.R. & R.C. FOX, 1980. Recolonization of streams by aquatic insects following channelization. *Rep. Water Resour. Res. Inst. Clemson Univ.* 87, pt. 1: IV+120 pp. (text), pt 2: II+57 pp. (bibl.). — (2305 Dearborne St., Augusta, Georgia 30904, USA). 5 channelized and 2 natural streams in the Piedmont and Coastal Plain regions, South Carolina, USA were sampled (1975-1979) to determine the effect of channelization on the species composition and diversity of aquatic insects. In addition, Surber square foot, core, and kickscreen sampling devices were utilized to determine optimal methods of stream sampling. The Odon. are also considered, and 28 identified spp. are listed.
- (3397) [WHIZZARD, G.] [?], (text) & G. BERNARD (illustrations), 1980. *Dragonflies. "Nature's Way"*, Whizzard & Deutsch, London. IV+28 pp. — Price: £ 2.25. — (Publishers: 105 Great Russel Str., London, W.C.1., UK) This is the original Engl. edition of the volume listed in *OA* No. 3283. — (*Abstracter's Note*: The authorship of the text is not clearly indicated).
- (3398) ZELIENÝ, J., 1980. Řád Váňky — Odonata. [Order dragonflies — Odonata]. In: R. Razkošný. [Ed.]. *Klíč vodních larev hmyzu [A key to the aquatic insect larvae]*, pp. 68-85. Czechoslovak Acad. Sci., Prague.
- (3399) (Anonymous), 1981. 6. Int. Odonatologie-Symposium. *Bündner TagBl., Chur* 129 (192): 2 (Aug. 17). General information on the international odonatological symposia, with special reference to the Sixth Int. Symp., Chur, Aug. 16-24, 1981. A pictorial key for identification of the local odon. genera is also included. (Cf. *OA* No. 3450).
- (3400) *ABSTRACTS OF PAPERS read at the Sixth International Symposium of Odonatology.* Chur, 1981. Edited by H. Schiess. Issued by the Societas Internationalis Odonatologica (S.I.O.), Chur, 76 pp. — Price: Hfl. 35.— (incl. the Program- and Field Trips booklets; cf. *OA* Nos. 3421, 3450) — (c/o Editors of Odonatologica, Dept. Anim. Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL.) — For the addresses of the authors contact the Editors of Odonatologica. *Feature and Submitted Papers: Askew, R.R.*: Resting sites of adult damselflies (Zygoptera) (9); — *Cannings A.*: The larvae of the Tarnetrum subgenus of *Sympetrum*, with a description of the larva of *Sympetrum nigrocreatum* Calvert (Odonata: Libellulidae) (9-10); — *Crowley, H. & M. Johnson*: Co-occurrence of Odonata in the eastern United States (10-11); — *Csiby, M. & S. Toth*: The latest results of recent research on the Odonata fauna of the Bakonyi Mountains (11-12); — *Deacon, K.J.*: The seasonality of Temperate Zone Odonata (12-13); — *Dufour, C.*: Endangered dragonflies in western Switzerland (13-14); — *El Amin El Rayah, M.*: Food preference of nymphs of *Ischnura senegalensis* Rambur (Zygoptera: Coenagriidae) (14); — On the biology of the dragonfly *Crocothemis erythraea* (Brullé) (Anisoptera: Libellulidae) (15); — *Fincke O.M.*: Reproductive strategies and mating success in two coenagrionid damselflies

- (*Enallagma hageni* and *Enallagma boreale*) (15-16); — *Garrison, R.W.*: Reproductive isolation in damselflies: methods of coexistence among four species of *Enallagma* from the western United States (16-17); — *Gonzalez Soriano, E.*: Studies on Neotropical Zygoptera: the reproductive behaviour of *Palaemnema desiderata* Selys (Odonata: Platystictidae) (17-18); — *Halverson, T.*: Variable environments, habitat selection and life-history traits in some pond-breeding anisopteran odonates (18); — *Hassan, A.T.*: The effect of environmental stress on the population structure of *Urothemis assignata* Selys larvae in a tropical pond (19); — *Herzog, H.-U.*: Effects of various media on the hemolymph of the *Aeshna cyanea* larva (Odonata: Aeshnidae) (20); — *Nomakuchi, S., K. Higashi, Y. Okame, M. Harada & M. Maeda*: An analytical study of territoriality of *Mnais pruinosa pruinosa* Selys (Zygoptera: Calopterygidae) (20-21); — *Kaiser, H.*: Intraspecific aggression, territorial behaviour, and "temporal" behaviour in dragonflies (21-22); — *Kiauta, B.*: A review of the main achievements in odonate taxonomy and systematics from 1971 to 1980 inclusive (22-25); — *Komnick, H., J. Bongers & W. Fischer*: Lipid absorption in the midgut of larval *Aeshna cyanea* (25-26); — *Komnick, H.*: The rectum of larval dragonflies as jet-engine, respirator, fuel depot and ion pump (26-27); — *Kukulies, J.*: Fine structure and tracer permeability of the cuticle and cell junctions of the rectal chloride epithelia in *Aeshna cyanea* larvae, a comparative freeze-fracture and thin-section study (27); — *Lavoie-Dornik, J., M. Gogala & J.-G. Pilon*: Electrophysiology of the compound eyes of *Enallagma cyathigerum* (Charp.) (Odonata: Coenagrionidae) (28); — *Lavoie-Dornik, J. & J.-G. Pilon*: Ultrastructure of the compound eye of *Enallagma cyathigerum* (Charp.) (Odonata: Coenagrionidae) (28); — *Lohmann, H.*: The Metzazygoptera: a new suborder and connecting link between Zygoptera and Anisozygoptera (29); — *Martens, K. & H.J. Dumont*: Description of the larval stages of the desert dragonfly *Paragomphus sinaiticus* Morton (nymph and five preceding instars), with notes on the larval habitat and a comparison with two related species (29-30); — *Mathavan, S.*: Effects of body weight, temperature, food quantity and dissolved oxygen concentration on ventilation in nymphs of *Pantala flavescens* (30-31); — *Mill, P.J.*: A decade of dragonfly neurobiology (31); — *Mitra, T.R.*: Indian odonatology — a review (32); — *Miyakawa, K.*: Behaviour and life span of adult *Calopteryx atrata* Selys and *C. virgo japonica* Selys (Odonata: Calopterygidae) (33); — *Moore, N.W.*: Conservation of Odonata — first steps towards a world strategy (34); — *Norling, U.*: How can dragonflies live above the Arctic Circle? — Some aspects of the influence of climate on dragonfly life-histories (35-36); — *Parr, M.J.*: Some aspects of territoriality in *Orthetrum coerulescens* (Fabr.) (Anisoptera: Libellulidae) (36-37); — An analysis of territoriality in libellulid dragonflies (37); — *Pilon, J.-G.*: Influence of temperature on the embryonic development of *Enallagma vernale* (Gloyd) and *E. ebrium* (Hagen) (Odonata: Coenagrionidae) in Quebec (38); — *Pinhey, E.C.G.*: *Platycypha caligata* (Selys) and a new lacustrine morph (Odonata: Chlorocyphidae) (38-39); — *Pritchard, G.*: Life history strategies in dragonflies and the colonization of North America by the genus *Argia* (39); — *Robertson, H.M.*: The mating behaviour of *Platycypha caligata* (Chlorocyphidae) (40); — *Schmidt, E.*: Biogeographische Analyse der Odonatenfauna Mitteleuropas (41-42); — *Schneider, W.*: Man-induced changes in the dragonfly fauna of the Jordan Valley (42); — *Sherk, T.*: Dragonfly vision (43); — *Tembhare, D.B.*: Endocrinology of Odonata (44); — *Thakare, V.K., D.B. Tembhare & M.W. Khan*: Neuroendocrine regulation of carbohydrate metabolites in the haemolymph of the dragonfly *Pantala flavescens* (Fabr.) (44-45); — *Tennesen, J.*: Review of reproductive isolating mechanisms in Odonata (45-46); — *Thompson, D.J.*: Prey density and survival in damselfly larvae: field and laboratory studies (46-47); — *Ueda, T. & M. Iwasaki*: Seasonal change of distribution and move-

- ment pattern in *Lestes temporalis* (47-48); — *Valtonen, P.*: The mapping of the distribution of Finnish dragonflies (48); — *Waage, J.K.*: Sexual selection and evolution of odonate reproductive behaviour (49); — *Watson, J.A.L.*: Dragonflies in the Australian environment: Taxonomy, biology, and conservation (50); — *Westfall, M.J.*: Current progress in taxonomic studies of American Odonata (51-52); — *Wildermuth, H. & A. Krebs*: The importance of man-made habitats for the conservation of Odonata in Switzerland (52-53); — *Winstanley, W.J.*: A review of the biology of the Petaluridae (53); — *Yousuf, M.*: The genus *Orthetrum* Newman (Anisoptera: Libellulidae) in Pakistan (54). — Poster Papers: *Carchini, G., S. Di Cave & P. Nicolai*: Coexistence and resource partitioning of *Lestes virens* and *Lestes barbarus* in a temporary pond (55); — *Lavoie-Dornik, J., M. Mouze, J.-G. Pilon & C. Marullo*: Ommatidie d'un anisoptère (Leucorrhinia): vue au microscope à balayage (55-56); — *Machado, A.B.M.*: Preparation of the penis of libellulids for study in the scanning electron microscope using critical point drying and freeze-drying methods (56-57); — *Masseau, M.J. & J.-G. Pilon*: Clef d'identification des stades larvaires d'*Enallagma boreale* Selys, *E. ebrium* (Hagen), *E. hageni* (Walsh) et *E. vernale* Gloyd (Odonata: Coenagrionidae) (57); — Etude de la variation intra-stade au cours du développement postembryonnaire de *Enallagma hageni* (Walsh) (Zygoptera: Coenagrionidae): facteurs agissant sur la différenciation des types de développement (57-58); — Influence de la température sur l'incubation des oeufs de *Enallagma hageni* (Walsh) (Odonata: Coenagrionidae) (58-59); — *Mill, P.J.*: Metamorphosis and neuromuscular changes in Aeshnidae (59); — *Miller, P.L.*: Copulatory mechanisms in Odonata (59-60); — *Mol, A.W.M.*: Karyological relationships within the Palaeoptera (60-61); — *Mouze, M.*: A new method for marking dragonflies (61-62); — *Nicolai, P., G. Carchini & S. Di Cave*: A comparative study of the life cycles of four coexisting coenagrionid species in two ponds of central Italy (62-63); — *Pfau, H.K.*: Funktionelle Anatomie des Flugapparates der Libellen (63); — *J.-G. Pilon & J. Masseau*: Morphologie externe des larves de *Enallagma hageni* (Walsh) (Odonata: Coenagrionidae) (64); — *Suzuki, K. & D. Tadauchi*: Morphometrical analysis of intraspecific variation in two Japanese dragonflies (Odonata). I. Cross-vein number (64-65); — *Utzeri, C. & R. Raffi*: Adult behaviour of *Lestes barbarus* (Fabr.) and *L. virens* (Charp.) at small ponds, with some ecological notes (65-66); — *Utzeri, C., R. Raffi & N. Falchi*: Some observations on the behaviour of *Aeshna affinis* (Vander L.) at a temporary pond (Odonata: Aeshnidae) (66-67); — *Van Poelgeest, R. & P. van der Steen*: Karyotypic variation in some European coenagrionid dragonflies (67); — *Van Zinnicq Bergmann, F.F.M.*: Annotations on chromosome complements of some Tanzanian dragonflies (East Africa) (68); — *Verdonk, M.*: Specific differences in population structure and reproductive behaviour in coexisting populations of *Ischnura elegans* (Vander L.) and *I. pumilio* (Charp.) (Zygoptera: Coenagrionidae) (68-69). — Slide and Movie Programs: *Belle, J.*: Odonata floridana (70); — *Csiby, M. & S. Toth*: The Hungarian dragonflies of the Bakony Mountains and their biotopes (71); — *Kiauta, B.*: Ten years of the International Odonatological Society: history, development and perspectives (72); — *Pinhey, E.*: Scenes and Odonata from Museum safaris (National Museum, Bulawayo/Zimbabwe) (73); — *Sandhall, Å.*: Some northern dragonflies (73). — Workshops: *Corbet, P.S.*: A review of certain topics in odonatology in the context of current knowledge (74); — *Schmidt, E.*: European Invertebrate Survey/Odonata (75). — Additional inlay sheets: *Demarmels, J.*: The genus *Euthore* Selys in Venezuela, with special notes on *Euthore fasciata fasciata* Hagen (Zygoptera: Polythoridae); — *Schlüter, T.*: Fossil dragonflies from the Jurassic Cretaceous junction of southwestern Egypt. — (Cf. OA No. 3450).

GREIN, 1981. Zur Verbreitung von Libellen, Heuschrecken und Tagfaltern in Niedersachsen (Stand 1980). *Beih. SchrReihe NatSchutz Landschaftspf. Niedersachs.* 1: 1-244. — Price: DM 6.—. (Abt. Naturschutz, Niedersächs. Landesverwaltungsamt, Richard-Wagner-Str. 22, D-3000 Hannover-1, GFR).

This is an updated and greatly enlarged edition of the volume listed in *OA* No. 2831, in which the TK 25 grid is adopted. Maps are produced for 58 odon. spp., showing the known distribution in 4 periods, viz. prior to 1961, 1961-1970, 1971-1975, and 1976-1980. The number of records is very impressive: while 3027 are available for the period 1977-1978, no less than 11778 were registered during 1979-1980. The publication is to be understood as an interim report, hence it does not include any comments on the taxa concerned. The locality names are also omitted, but a list of recorders is given for each sp.

- (3402) ANDRÉ, P., P. LEGENDRE & P.P. HARPER, 1981. La sélectivité de trois engins d'échantillonnage du benthos lacustre. *Annls Limnol.* 17 (1): 25-40. (With Engl.s.). — (Third author: Dép. Sci. Biol., Univ. Montreal, C.P. 6128, Montreal, Que., H3C 3J7, CA).

Measures of ecological likeness, a technique of ordination in reduced space, and a contingency analysis were used in a comparison of benthos sampled with a Ponar grab and 2 basket-type artificial substrates, one filled with stones, and the other with synthetic webbing. The 3 devices are selective, given the mode of action of each sampler and the ways of life of the organisms collected. The stone-filled basket gives results which are intermediate between those from the grab and the webbing basket. The Odon. were collected, but the group is not discussed further.

- (3403) ASAHINA, S., 1981. [Odonata]. In: Japanese Environmental Agency, [Pubs], [The second basic survey of the natural environment, Division Zoology, Section Insects],

pp. 10-17, 41-60, 196-200. (Jap., with cumulative Engl. s. on pp. 142-143). (Dated 1980, published March 31, 1981). — (Takanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA).

Information on the current status of some faunistically important insect spp. in Japan is presented with the objective to provide a basis for the conservation of the national environment. Among the 10 "index-spp.", well-known and distributed throughout Japan, there are 3 Odon., viz. *Epiophlebia superstes* (waterheads in well-forested mountain areas; often threatened by road construction and tourism), *Tanypteryx pryeri* (middle sections of mountain streams; no threat), and *Nannophya pygmaea* (lowland sphagnum marshes). The distributional maps of these are provided (original data published in 1979 by the Government Publishing Office; not available for abstracting).

- (3404) BAKER, R.L., 1981. *Spacing behaviour and life histories of nymphal Zygoptera*. Ph. D. thesis, Univ. Alberta, Edmonton. XV + 163 pp. — (Inst. Anim. Resource Ecol., Univ. British Columbia, 2075 Wesbrook Mall, Vancouver, B.C., V6T 1M5, CA).

The objective of this study was to determine whether larvae of some zygopteran spp. exhibit a form of spacing behaviour that could result in variation in larval development rate. — Diet altered development rate of *Coenagrion resolutum* and *Enallagma boreale* to the extent that some members of a cohort could emerge 1 yr before other individuals of the same cohort. In the laboratory, solitary *C. resolutum* remained primarily at one feeding area, even if other feeding areas of equal food value were nearby. Solitary larvae tended to remain at feeding areas that would result in maximum growth rate when areas of different food value were offered. When several individuals were present, some were excluded from feeding areas; but use of a feeding area was never totally exclusive. Large individuals excluded small ones, but larvae with previous experience with feeding areas had no advantage in remaining at feeding areas when native animals were

- added. — Larvae exhibited an array of behaviours, some being interpreted as aggressive. Exclusion of some individuals from feeding areas was a result of aggressive interactions, but the result of interactions (win or lose) was not site-dependent. Dominant animals spent more time at the feeding areas than subordinate animals. — In the laboratory, solitary *Lestes d. disjunctus* did not remain at areas of food concentration, and there was no evidence that some individuals were excluded from areas of food concentration when several larvae were present. These results contrast with results of similar experiments using *C. resolutum*, but correlate with field life-history studies on populations of both spp. The *C. resolutum* populations had a variable life cycle; some individuals were univoltine while others were semivoltine. The entire *disjunctus* population developed synchronously and was univoltine. — Because diet markedly affected development rate, and because some larvae were excluded from areas of food concentration, the results reported here support the hypothesis that spacing behaviour of some spp. may result in altered life histories. However, because the first animal at feeding areas had no advantage over intruding animals, and the outcome of aggressive interactions was not site dependent, spacing behaviour is considered to be based on the dominance and limited movement of some individuals instead of on a territorial system, as suggested by other authors. (Author).
- (3405) BAKER, R.L. & H.F. CLIFFORD, 1981. Life cycles and food of *Coenagrion resolutum* (Coenagrionidae: Odonata) and *Lestes disjunctus disjunctus* (Lestidae: Odonata) populations from the boreal forest of Alberta, Canada. *Aquatic Insects* 3 (3): 179-191. — (Inst. Anim. Resource Ecol., Univ. British Columbia, 2075 Westbrook Mall, Vancouver, B.C., V6T 1W5, CA). In a boreal forest pond of Alberta, Canada, some *C. resolutum* were univoltine, while others were semivoltine; all *L. disjunctus* were univoltine. Life cycles and diet of larvae (mainly Cladocera and Chironomidae) of both spp. were similar in the different vegetation zones.
- (3406) BELLE, J., 1981. A new species of Phyllogomphoides from Ecuador (Odonata: Gomphidae). *Ent. Ber., Amst.* 41 (11): 173-176. — (Onder de Beumkes 35, 6883 HC Velp, NL). *P. brunneus* sp. n. (♂ holotype: Macas, Prov. Morona Santiago; ♀ allotype: Limóncocha, Prov. Napo) is described and illustrated. Its affinities and variation are discussed.
- (3407) BELLE, J., 1981. An annotated list of the Gomphidae of Uruguay (Odonata). *Revta Fac. Human. Cien., Montevideo* (B) 1 (16): 261-264. (With Span. s.). — (Onder de Beumkes 35, 6883 HC Velp, NL). The spp. listed are *Cyanogomphus uncatus* Fraser, *Aphylla producta* Sel., *Phyllocyba argentina* Hag., *P. pallida* Belle, *P. propinqua* Belle, and *Progomphus lepidus* Ris. Collection data, descriptive notes and the regional bibliography are also provided.
- (3408) BIEDERMANN, J., 1981. Naturschutzgebiet "Ruggeller Riet", Ruggell, Fürstentum Liechtenstein: bisher beobachtete Libellenarten. *VIIth Int. Symp. Odonatol., Chur*. 1 p. — (Liechtensteinisches Gymnasium, FL-9490 Vaduz, Liechtenstein). A separately issued list of 17 spp. recorded from the nature reserve Ruggeller Riet, to go along with the description of the area, published in the volume listed in OA No. 3421. 7 of the spp. listed were not earlier recorded from the Principality of Liechtenstein (cf. OA No. 1099).
- (3409) bz, 1981. Am Dienstag im Kirchengemeindehaus Brandis: Diavortrag über Libellen. *Bündner Ztg., Chur* 105 (191): 2 (Aug. 17). Daily's article on the occasion of a public talk on dragonflies, given in Chur, on Aug. 18, 1981 in the framework of the Sixth Int. Symp. Odonatol. by A. Krebs & H. Wildermuth. The talk was sponsored by the Nat. Hist. Soc. of Grisons (Naturforschende

Gesellschaft Graubündens) and was presented in the local dialect. (Cf. *OA* No. 3450).

- (3410) CANNINGS, S.G., 1981. New distributional records of Odonata from northwestern British Columbia. *Syesis* 13: 13-15. — (Dept. Zool., Univ. British Columbia, 6270 University Blvd, Vancouver, B.C., V6T 2A9, CA).
A list of collection records for 19 spp. is presented along with some notes on distribution, phenology and taxonomy. Among the more interesting records is a larva of *Aeshna juncea*, recovered from a slightly saline oceanside pond at Stewart.
- (3411) CLAUSNITZER, H.-J., 1981. Die Libellen im Naturschutzgebiet 'Breites Moor' bei Celle. *Beitr. Naturk. Niedersachs.* 34 (2): 91-101. — (Südstr. 6, D-3160 Eschede, GFR).
The odon. fauna (35 spp.) of the Nature Reserve, the 'Breites Moor', nr. Celle, Lower Saxony, German Federal Republic, is enumerated, its composition is analyzed, and the conservancy aspects of the area are briefly discussed.
- (3412) *CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS* [Newsletter of the Dutch Dragonfly Workers], No. 2 (Oct., 1981). Issued by the Werkgroep Nederlandse Libellenonderzoekers [Association of the Dutch Dragonfly Workers], Bussum; edited by M. Verdonk & J.W. Schoorl. — (Dutch). — Subscription for 1981: Hfl. 10,—. — (c/o M. Verdonk, Florialialaan 47, 1402 NJ Bussum, NL; — for order conditions cf. *OA* No. 3214).
The 'Editorial' and the Preliminary Announcement of the Seventh (1982) Colloquium of Dutch Dragonfly Workers (*M. Wasscher*) are followed by various news items and reports on the activities of S.I.O. (report on the the Sixth Int. Symp. Odonatol., *M. Verdonk*), the European Invertebrate Survey (*J. van Tol*), on the Dragonfly Study Group of the Dutch Youth Federations (A.C.J.N., N.J.N.) of Nature Friends (coordinators: *H. Olf*: Kievitsweg 29, 8191 BE Wapenveld, & *L. Beukeboom*: v. Sijensstr. 50a, 9724 NR Groningen), by a report on the Sixth Colloquium of Dutch Dragonfly Workers, Amsterdam, May 16, 1981, *P. Schoorl*), and by a book notice (*M. Verdonk*). On p. 6, there is an obituary notice for Lt. Col. Dr C. de Jong (*B. Kiauta*), and a list is provided of the 45 members and institutional subscribers of the Association.
- (3413) DANKS, H.V., 1981. Bibliography of the Arctic arthropods of the Nearctic Region. *Ent. Soc. Canada, Ottawa*. VI + 126 pp. (c/o Ent. Soc. Can., 1320 Carling Ave., Ottawa, Ont., K1Z 7K9, CA).
11 titles are marked as containing odonatol. information.
- (3414) DAVIES, D.A.L., 1981. A synopsis of the extant genera of the Odonata. *Soc. int. odonatol. rapid Comm.* 3: XIV + 60 pp. — (Crofton Lodge, 8 Drury Lane, Mortimer, Reading RG7 2JL, UK). — Orders to be sent to the Editors of *Odonatologica*, Dept. Anim. Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL. — Price: Hfl. 30.— net.
This is the first synopsis of the extant higher taxa of the Order that has become available since the publication of W.F. Kirby's catalogue, almost a century ago. While 319 genera were known to Kirby in 1890, 630 genera are listed in the present work. They are organized alphabetically within subfamilies; the authority, type species and the general range are also stated. In addition, among other information, brief characterisations are provided of 8 superfamilies, 28 families and 64 subfamilies.
- (3415) DOMMANGET, J.-L., 1981. Introduction à l'étude des libellules (Odonates). *Bull. Soc. Sci. nat., Compiègne* 1981 (29/30): 41-51. (With Engl. s.). — (7 rue Lamartine, F-78390 Bois d'Arcy).
The need for (departmental faunal surveys in France is stressed, and the necessity to set up reference collections is emphasized. The paper is directed at amateur entomolo-

- gists, presenting notes on (French) odon. habitats, flight periods and on other aspects important for the collector. Instructions are given for collecting and specimen preparation of all stages, the apparatus used for laboratory breeding is described, and notes are presented on field- and laboratory photography of dragonflies.
- (3416) DONATH, H., 1981. Ergänzungen zur Libellenfauna des Körbaer Teiches. *Biol. Stud. Luckau* 10: 42-45. — (Jahnstr. 6, DDR-7960 Luckau, GDR). 5 spp. are added to the list published in the paper listed in *OA* No. 2595.
- (3417) DONATH, H., 1981. Über zwei für die nordwestliche Niederlausitz neu nachgewiesene Libellenarten. *Biol. Stud. Luckau* 10: 61-63. — (Jahnstr. 6, DDR-7960 Luckau, GDR). *Coenagrion lunulatum* and *Cordulegaster boltoni* are added to the list published in the paper given in *OA* No. 3109, bringing the number of the odon. spp. known from the NW Niederlausitz, German Democratic Republic, up to 53.
- (3418) DONATH, H., 1981. Notizen zur Fauna des Warmwassergrabens bei Klein-Beuchow. *Biol. Stud. Luckau* 10: 66-67. — (Jahnstr. 6, DDR-7960 Luckau, GDR). *Platycnemis pennipes*, *Ischnura elegans*, *Calopteryx splendens*, *Ophiogomphus serpentinus*, *Orthetrum cancellatum* and *Symptetrum pedemontanum* adults were recorded on the thermal effluent of the Lübbenau power plant, district Calau, German Democratic Republic (temperature range 22.0-38.5°C, "relatively high velocity"). *O. cancellatum* is considered to be autochthonous.
- (3419) EDA, S., 1981. Review of the 1980's dragonflies. *Nature and Insects* 16 (7): 13-20. (Jap., with Engl. title). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA). This is the regular annual review of the main Japanese odonatol. achievements and events in 1980. Among these are over 80 publications by Japanese authors, and the organization of 4 odonatol. meetings in Kyoto and Osaka on the occasion of the XVIth Int. Congr. Entomol. — (*Editor's Note*: The Editor of *OA* has to apologize also in this place for his inability, in spite of numerous attempts, to provide an adequate and rapid coverage of the Japanese literature).
- (3420) EDA, S., 1981. Dragonflies on stamps in the world. Third report. *Nature and Insects* 16 (8): 27-29. (Jap., with Engl. title). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA). 11 postage stamps are illustrated and described, viz. Singapore (1962), Romania (1964), Lebanon (1965), New Zealand (1969), Poland (1973), Yugoslavia (1976), Lesotho (1978), Sweden (1979), and Japan (2 in 1979, 1 in 1980). — (For pts I-II cf. *OA* Nos 1980, 2572).
- (3421) *FIELD TRIPS in the framework of the Sixth International Symposium of Odonatology, Chur, 1981.* Edited by H. Schiess. Issued by the Societas Internationalis Odonatologica (S.I.O.), Chur, 24 pp. (Engl.). — Price: cf. *OA* No. 3400. — (c/o Editors of *Odonatologica*, Dept. Anim. Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL). *Kiauta, B.* (Dept. Animal Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL): Some requests and suggestions concerning dragonfly collecting during the field trips, at the Post-Symposium Tour, and generally in Switzerland (3-5). — The small field trips: *Kiauta, B. & M. Kiauta* (address above): The Seebenalp area in the Flumserberg, canton St. Gallen (6-7); *Wolf, M.* (Altwiesenstr. 345, CH-8051 Zürich): Unterer Prätschsee, Arosa GR (7-8); — Zizerser Baggerseen, Zizers GR (8-9; cf also *OA* No. 17); — Balzers and Vaduz, Principality of Liechtenstein (9-10); Ruggeller Ried, Principality of Liechtenstein (10-11; cf. *OA* No. 3408); — Dreibündenstein, Malix GR (11-12). — [The Post Symposium Tour]: *Kiauta, B.* (address above): The Engadine Post-Symposium Tour (13-

- 20). — [Miscellaneous]: [*Kiauta*, B. & M. *Kiauta*] (address above): Some hints for the "points of odonatological interest" in the city of Chur (21-22). — (Cf. *OA* No. 3450).
- (3422) FORGE, P., 1981. Développement et rendement de croissance des larves d'*Urothemis assignata* Selys (Odonata: Libellulidae) dans la région de Lamoto (Côte-d'Ivoire). *Acta oecol.* 2 (3): 213-226. (With Engl. s.). — (Ecole Norm. Supér., 08 B.P. 10, Abidjan, Côte-d'Ivoire).
The larval development of *U. assignata* was studied in captivity. From egg to metamorphosis the development requires 130 days: prolarva and 9 instars (ultimate instar figured). The allometric growth curves relating fresh weight with total body length are calculated. The individual global consumption during larval development is 1.422 mg and the daily intake passes from 0.32 g/g Lib. to 0.08 g/g Lib., between stages IV and IX. Both consumption and weight production are linear functions of the larval fresh weight. Daily production at the IXth instar reaches 6 mg, i.e. 25% of the daily intake. The validity of the results and the influence of the laboratory conditions are considered and the data are related to the earlier literature. (Author).
- (3423) FRASERIA. Newsletter of the S.I.O. National Office in India, Ukai. No. 1 (Dec. 1, 1981). — Free for the Indian members and subscribers of the International Odonatological Society (S.I.O.); upon application to the Editor of *Odonatologica* free for residents of Afghanistan, Bangladesh, Bhutan, Brunei, Burma, Cambodia, India, Indonesia, Laos, Malaysia, the Maldives, Nepal, Pakistan, Singapore, Sri Lanka (Ceylon), Thailand, Tibet (Autonomous Region of China) and Vietnam; all others US \$1. — per issue. — (c/o Editor: Dr B.K. Tyagi, Malaria Res. Cent., I.C.M.R., UGH 61-70 / Sector VI, Ukai-394680, Distr. Surat, Gujarat, India).
It is the objective that the newsletter will appear semiannually, and will serve as a vehicle for communication among Indian workers. The following notes appear in the present issue: "S.I.O. National Office opened in India" [on Dec. 1, 1981, sanctioned by the S.I.O. Plenary Business Meeting in Chur, Switzerland, Aug. 18, 1981, and headed by the Editor of the newsletter]; "Main tasks of the S.I.O. Indian Office"; "Societas Internationalis Odonatologica"; "First informal meeting of the Indian odonatologists" [organized by S.I.O. in the framework of the 1982 Symposium of the Indian Science Congress Association, Mysore, Jan. 4, 1982]; "About the newsletter 'Fraseria' [named after the 'Father of Indian Odonatology', Lt. Col. Dr F.C. Fraser]; "Request to the readers"; "The 1982 S.I.O. membership fees for the Indian residents"; "Important checklist of the extant odonate genera of the world" [cf. *OA* No. 3414].
- (3424) GARRISON, R.W., 1981. Population structure of the rare damselfly, *Ischnura gemina* (Kennedy) (Odonata: Coenagrionidae). *Oecologia* 48: 377-384. — (Calle Iris UU-18 B, Borinquen Gardens, Rio Piedras, Puerto Rico 00926, USA).
The population structure of the endemic San Francisco Bay Area *I. gemina* was examined using mark-recapture methods. Average daily movements, sex ratios, population size, maturation times, survivorship, and dispersion patterns were recorded and calculated from 2 small sites nr Glen Canyon, San Francisco, USA. Of 563 adults marked over 36 days, 412 (73%) were recaptured at least once. Average daily movements for males and females were less than 6 m, suggesting local movements. However, directional movements of 150 m were observed from one site to the other, indicating dispersal potential. One of the populations was a satellite composed entirely of emigrating individuals from the other site; no larvae or teneral adults were found at the satellite area. Males were more aggregated than females at both sites. Both sexes were highly clumped at one site, but were nearly randomly dispersed at the other site. Total

population size for both sexes tended to be constant throughout the sampling period, at about 250. Adult population estimates showed more males were present than females, but larval counts at one site indicated only a slight excess of males. Average life span estimates ranged from 6.5 days (females) to 23.3 days (males). One male lived at least 36 days. Maturation time for males was about 5-7 days, 7-10 days for females. A long life span and long flight season (March to November) are probably adaptations to the foggy San Francisco climate. All populations of *I. gemina* located to date are small, possibly originating from founders from nearby demes, and may be subject to different selection pressures. The dispersal potential of *I. gemina* may increase its chance of survival should small urban demes be threatened with destruction.

(3425) GILBERT, O.L., 1981. Records. Odonata-dragonflies. *Vasculum* 66 (2): 14-15. (Author's address not stated).
4 spp. are listed from 2 localities in the Chester-le-Street area, United Kingdom.

(3426) GOÑI, B. & Y.P. DE ABENANTE, 1981. Estudio cromosómico de cinco especies de odonatos del Uruguay. *Res. Com. Jornadas Cienc. nat., Montevideo* 2: 47-48. — (Dep. Artrópodos, Fac. Human. & Cienc., Univ. de la Republica, Tristán Narvaja 1764, Montevideo, Uruguay).
The chromosome complements are reported of the following 5 spp. from Uruguay: *Ischnura fluviatilis* (Salto, Artigas; n♂ = 14, m), *Erythrodiplax atroterminata* (Salto; 2n ♀ = 26), *E. chromoptera* (Artigas; n♂ = 11, m, XO), *E. nigricans* (Montevideo; n♂ = 13, m), and *Perithemis mooma* (Salto; n♂ = 13, m). The 3 *Erythrodiplax* spp. are new for cytology.

(3427) GOPAL, K., R.N. KHANNA, M. ANAND & G.S.D. GUPTA, 1981. Acute toxicity of endosulfan to fresh-water organisms. *Toxicol. Lett., Amst.* 7 (6): 453-456. — (Indian Toxicol. Res. Cent., P.O. Box 80, Mahatma Gandhi Marg, Lucknow-226001,

India).

A statistic bioassay was performed to measure short-term (96 hr) toxicity of the said insecticide to juvenile catfish *Clarias batrachus*, frog tadpoles of *Rana tigrina*, and larvae of *Enallagma* sp. Median tolerance limit, slope function, confidence limit and presumable harmless concentration were computed. The tadpoles were more susceptible to endosulfan than the dragonfly and catfish. Morphological changes and behavioural alterations are evaluated as symptoms of endosulfan toxicity.

(3428) HÄMÄLÄINEN, M., 1981. *Finnish odonatological literature. A preliminary list of papers, scientific notes or meeting communications dealing with Finnish Odonata or other odonatological publications written by Finnish entomologists*. Privately issued. II + 24 pp. — (Dept. Agric. & Forest Zool., Univ. Helsinki, SF-00710 Helsinki-71).

The bibliography covers the period 1715-1980, and contains close to 300 references.

(3429) HARITONOV, A.Yu., 1981. Morfologiya i biologiya maloizvestnogo vida strekoz *Gomphus epophthalmus* Selys (Odonata, Gomphidae). — (On the morphology and biology of little-known species of dragonflies *Gomphus epophthalmus* Selys [Odonata, Gomphidae]). *New little-known Spec. Siber. Fauna* 1981: 111-113. (Russ., with Engl. s.). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).

G. epophthalmus is one of the least known Siberian spp. It has long been considered an East Asiatic sp. (NE China, the USSR Littoral), until a female was taken and described from the Ina R., SW Siberia (cf. *OA* No. 863). In 1979, on the same river, long series were collected. The adult stage of both sexes is here described and illustrated, and notes are provided on habitat, breeding and behaviour.

(3430) HASSAN, A.T., 1981. Coupling and oviposition behaviour in two macrodiplacinid

libellulids — *Aethriamantha rezia* (Kirby) and *Urothemis assignata* Selys (Libellulidae: Odonata). *Zool. J. Linn. Soc.* 72: 289-296. — (Ent. Res. Unit, Dept. Zool., Univ. Ibadan, Ibadan, Nigeria).

The observations were carried out in the Ibadan area, Nigeria. Sperm translocation occurs in both libellulids after the male has secured the female. Pre-mating tandem flight occurs prior to mating. Mating is long in *A. rezia* (384-716 s, mean 480) and shorter in *U. assignata* (69-122 s, mean 94). After mating, both libellulids rest in tandem, the duration being longer in *A. rezia* (25-82 s, mean 42) than in *U. assignata* (0-24 s, mean 11). This is followed by tandem exploration in *A. rezia* and later by oviposition, the male guarding the female. In *U. assignata*, tandem exploration is absent, but oviposition is usually in tandem. The duration of oviposition is similar in both libellulids — 67-148 s, mean 95, in *A. rezia* and 63-183 s, mean 133, in *U. assignata*. *Aethriamantha rezia* oviposits mainly on *Pistia stratiotes* while plants utilized by *U. assignata* are more variable, although *P. stratiotes* is also preferred. The number of eggs laid per oviposition is high, averaging 435 in *A. rezia* and 398 in *U. assignata*. High population of males at water prolongs mating and oviposition in the two species. The ecological habitats of both overlap. (Author).

- (3431) HENNIG, W., 1981. *Insect phylogeny*, Wiley, Chichester-New York-Brisbane-Toronto. XII + 514 pp. — Price: £ 28.—. (Author deceased).
This is a revised (by D. Schlee) Engl. edition of the 1969 German work (*Die Stammesgeschichte der Insekten*, Kramer, Frankfurt/Main). The Odon. are dealt with on pp. 350-356. Of interest is the phylogenetic tree of the extant families.
- (3432) HIGASHI, K., 1981. A description of territorial and reproductive behaviours in *Mnais pruinosa* Selys (Odonata: Calopterygidae). *J. Fac. lib. Arts Saga Univ.* 1981 (13): 123-140. — (Dept. Biol., Fac. Liberal Arts Saga Univ., Saga, 840, JA).

The study was performed in a mountain stream NE of Fukuoka City, Japan, inhabited by ♂-f. *esaki*, ♂-f. *strigata*, and by a hyaline-winged ♀-form. The territorial and non-territorial behaviour in males are described, and the spatial structure of the male population is discussed. Based on the observations on the territorial and reproductive behaviour, the function of the territory in Zygoptera is discussed, and some general considerations on the relations between territoriality and population density are considered.

- (3433) JURZITZA, G., 1981. [Grüne Keiljungfer (*Ophiogomphus serpentinus*)]. In: G. Friedrich, [Ed.], *Fließgewässer: Bedeutung-Gefährdungen-Schutz*, p. 10. Deutscher Naturschutzring, Bonn. — (Bot. Inst., Univ. Karlsruhe, Kaiserstr. 12, D-7500 Karlsruhe, GFR).
A colour photograph.
- (3434) KABISCH, K. & J. HEMMERLING, 1981. *Tümpel, Teiche und Weiher - Oasen in unserer Landschaft*. Edition Leipzig. 270 pp., pls incl. — (Krockerstr. 9, DDR-7022 Leipzig, German Democratic Republic).
The work is directed at the general reader. The biology of the stagnant freshwater habitats, exemplified by the conditions of Central Europe, is dealt with in considerable detail, covering the abiotic factors, biotic communities, physiology and ecology of aquatic organisms, and the economic and other aspects of aquatic habitats and their research, management and conservation. The Odon. are mentioned on various places. The original approach, the pleasant and concise style, as well as the numerous, well-chosen illustrations classify the book among the best readings in this field in the modern German literature.
- (3435) KAPPES, H.-J. & A. SIDOW, 1981. Lop-pautallagerbericht Teil 2. Libellen und Schmetterlinge. *Naturk. Beitr. DJN* 7: 10-15. — (Auf den Wöörden 26, D-2000 Hamburg-67, GFR).
A list is given of 26 odon. spp., collected May

- 14-22, Aug. 13-17, and Sept. 26-28, 1980 in the Valley of Loppau nr Luneburg, S of Hamburg, German Federal Republic.
- (3436) ke, 1981. Symposium im Natur-Museum: Libellenforscher aus aller Welt. *Bündner Ztg, Chur* 105 (186): 3 (Aug. 11). Daily's article on the occasion of the Sixth Int. Symp. Odonatol., Chur, Switzerland, Aug. 16-24, 1981. (Cf. *OA* No. 3450).
- (3437) ke, 1981. Symposium der Libellenforscher in Graubünden: ein breit gefächertes Programm mit Exkursionen. *Bündner Ztg, Chur* 105 (191): 3 (Aug. 17). Daily's article on the occasion of the opening of the Sixth Int. Symp. Odonatol., Chur, Switzerland (Aug. 16-24, 1981). A photograph of the gate of the Nat. Hist. Mus., decorated with the flag of the International Odonatological Society is also shown. (Cf. *OA* No. 3450).
- (3438) KHARITONOV, A.Yu. & A.S.N. BORISOV, 1981. Diplacodes Kirby — novyy dlya fauny SSSR rod strekoz (Odonata, Libellulidae). (Diplacodes Kirby — a new for the USSR genus of the dragonflies (Odonata, Libellulidae)). *Ent. Obozr.* 60(3): 604-606. (Russ., with Engl. s.). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., U1. Frunse 11, USSR-630091 Novosibirsk). A series of *Diplacodes lefebvrei* was taken at the Yakkodinskoe Lake, Tigrovaya Balka Nature Reserve, southwestern Tadzhik SSR, USSR (Sep. 2, 1978). The sp. is new for the USSR fauna. The morphology is described and the terminalia of both sexes are illustrated.
- (3439) KUMARI, K.R.N. & N.B. NAIR, 1981. On the predaceous naiad of *Rhodothemis rufa* (Rambur) (Insecta: Odonata). *Entomon* 5 (1): 57-60. — (Dept. Aquatic Biol. & Fish., Univ. Kerala, Trivandrum-695007, India). The ultimate instar larva of *R. rufa* from Trivandrum, Kerala, India is described and illustrated, and some notes on its biology are supplied.
- (3440) LAVOIE-DORNIK, J., J.-G. PILON, M.-A. ALI & M. MOUZE, 1981. Revue critique de la vision chez les odonates: électrophysiologie. *Rev. Can. Biol.* 40 (3): 287-304. (With Engl. s.). — (Dep. Sci. Biol., Univ. Montreal, C.P. 6128, Que., H3C 3J7, CA). A critical review and bibliography of the electrophysiology of the odon. vision are presented, covering the period 1952-1981, partim.
- (3441) MACHADO, A.B.M., 1981. *Memorial, apresentado ao Instituto de Ciências Biológicas de Universidade Federal de Minas Gerais, para Concorso de Professor Titular no Departamento de Morfologia*. Bello Horizonte. VI + 238 pp. (Portuguese). — (Dept. Morfol., Inst. Cienc. Biol., Univ. Fed. Minas Gerais, C.P. 2486, BR-30000 Belo Horizonte, Minas Gerais). The volume represents a self-evaluation of the author's scientific work, presented in fulfillment of the (Brazilian) requirements for the title of Full Professor in the Department of Morphology, Federal University of Minas Gerais, Belo Horizonte. The author is a Member of the Brazilian Academy of Sciences and one of the outstanding South American odonatologists. His odonatol. publications are dealt with on pp. 197-215.
- (3442) MAY, M.L., 1981. Wingstroke frequency of dragonflies (Odonata: Anisoptera) in relation of temperature and body size. *J. comp. Physiol.* (B) 144 (2): 229-240. — (Dept. Ent. & Econ. Zool., Cool Coll., Rutgers Univ., New Brunswick, New Jersey 08903, USA). (1) Wingstroke frequency during pre-flight warm-up, fixed flight, and self-supported flight on a tether was measured at several body temperatures (Tb) in 13 genera (19 spp.) of 4 families. — (2) Frequency increases as body size (mass or wing length) decreases and as Tb increases. The change in frequency for a given change in size is greater during flight than warm-up at any given Tb, while the rate of increase with temperature is greater during warm-up,

- regardless of size. — (3) The relationship of frequency during flight to wing length departs significantly from that predicted by the harmonic oscillator model of Greenewalt (1960), but the discrepancy can be explained in part by the absence of geometric similarity among dragonflies. Scaling of frequency during warm-up is substantially further still from predictions of the model, and in these circumstances the fundamental harmonic frequency probably is not realized. — (4) Among flying insects generally, the fit to the oscillator model is somewhat better than in dragonflies alone and is markedly improved if differences in wing-loading are also taken into account. — (5) Linear regressions of frequency on T_b fit the data about as well as exponential regressions. Regardless of the regression model used, temperature sensitivity of wingstroke frequency during flight is lower than that of most biological processes. The difference in temperature response between warm-up and flight frequencies is consistent with the different functions of these behaviors. — (6) During warm-up the quantity of heat produced per wingstroke increases with increasing T_b in small but not in large dragonflies. (Author).
- (3443) MESSNER, B., 1981. Über die Nützlichkeit faunistischer Beobachtungen. *Ent. Nachr.* 25 (2-3): 29-33. — (Dr.-W.-Külz-Str. 68, DDR-2200 Greifswald, GDR). *Calopteryx virgo* is reported from the Schwinge nr Pustow, German Democratic Republic.
- (3444) NOVELO GUTIERREZ, R., 1981. *Comportamiento sexual y territorial en Orthemis ferruginea (Fab) (Odonata: Libellulidae)*. [Sexual and territorial behaviour in *Orthemis ferruginea* (Fab) (Odonata: Libellulidae)]. M. Sc. thesis, Univ. Nac. Auton. Mexico. VIII + 63 pp. (Spanish). — (Lab. Ent., Dep. Zool., Inst. Biol., Univ. Nac. Auton. Mexico, Ciudad Universitaria, 04510 Mexico, D.F., Mexico). A detailed qualitative and quantitative analysis of the behaviour is presented.
- (3445) O'DONNELL, C.F.J., 1981. Foods of the New Zealand kingfisher (*Halcyon sancta vagans*). *Notornis* 28 (2): 140-141. — (198 Blenheim Rd, Christchurch-4, NZ). A note on the food of kingfishers in 3 New Zealand localities. *Uropetala carovei* was seen taken in flight in Westland. An analysis of 14 food pellets below a nest hole nr Taumarunui revealed 61 food items: 6 freshwater crayfish, 1 *U. carovei*, 2 *Procordulia grayi*, 1 phasmid, 3 cicadas, 1 lizard (Scincidae) and a range of coleopterans.
- (3446) PAVLYUK, R.S., 1981. Do vivchennya fauni babok (Insecta, Odonata) Chornogori ta sumizhnih girs'kih teritoriy. [Contribution to the knowledge of the dragonfly fauna of the Ukrainian Carpathians and the adjacent territories]. *Visn. Iviv. Univ. (Biol.)* 1981 (12): 113-115, 127. (Ukrainian, with Russ. s.). — (Dept. Invert. Zool., Lvov Univ., 4 Shcherbakov Str., USSR-290005 Lvov). The data are presented on the vertical distribution in the high elevations of the Ukrainian Carpathians. *Ischnura pumilio* occurs up to an elevation of 1438 m. It is emphasized that the regional fauna is but poorly explored.
- (3447) PFAFF, V., 1981. Abschied vom Libellensommer. *Die Pirsch* 33 (19): 1353. — (Author's address not stated). A poem inspired by the life-history of a dragonfly.
- (3448) PINHEY, E., 1981. Checklist of the Odonata of Moçambique. *Occ. Pap. natn. Mus. Rhod.* (B) 6 (8): 555-632, 6 col. pls incl. — (Wye View Villa, Gloucester Rd, Tutshill, Chepstow, Gwent, NP6 7DH, UK). The 150 spp. known to occur in Moçambique are catalogued. The information provided for each sp. includes references to original descriptions and depositions of types (14 taxa originally described from Moçambique), illustrations of genitalia, notes on ecology and general distribution. The locality names listed are those used before the Independence. A gazetteer is also

appended. Colour illustrations are provided of 39 spp.

- (3449) POLIVANOV, V.M., 1981. *Ekologiya ptic — duplognezdnikov Primor'ya*. [The ecology of the hollownesting birds of the Far-Eastern Littoral]. Nauka, Moscow, 171 pp. (Russ.). — (Biol. Inst., Far-Eastern Scient. Centre, USSR Acad. Sci., Ul. Stoletiya 159, USSR-690022 Vladivostok).

The Amur Red-footed Falcon (*Falco amurensis*), Broad-billed Roller (*Eurystomus orientalis*) and the Needle-tailed Swift (*Hirundapus c. caudatus*) are among the spp. regularly feeding on dragonflies in the Russian Littoral. The author has noticed, in various localities, that *F. amurensis* feeds its yearlings almost exclusively on libellulids.

- (3450) *PROGRAM AND GENERALITIES of the Sixth International Symposium of Odonatology, Chur*, 1981. Edited by H. Schiess. Issued by the Societas Internationalis Odonatologica (S.I.O.), Chur, 36 pp. — Price: cf. *OA* No. 3400. — (c/o Editors of Odonatologica, Dept. Anim. Cytogenet. & Cytotaxon., Univ. Utrecht, Padualaan 8, Utrecht, NL).

Akatombo (R. Miki and K. Yamada, text and music resp.) (2); — Symposium Officers (4); — Symposium location (5-7, with a map); — General information (Informal Arrival Gathering, Accommodation, Car parking, Meals, Symposium membership, Symposium publications, Symposium Dinner, Small field trips, Post-Symposium Tour to the Engadine valley, Glacier Tour, Odonata expositions, General talk on dragonflies, Ladies Program, Symposium Office and other official rooms, Mail, Poster procedure, IUCN meeting) (8-13); — Agenda of the SIO Business Meeting (14); — Scientific program (15-22); — List of participants and addresses of Full- and Student Members (23-36). — Additional inlay sheets: *Inoue, K.* (5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA): Aka-Tombo (Red Dragonflies): transliteration, translation, vocabulary and commentary; —

Chrebs [= Krebs], A. & H. Wildermuet [= Wildermuth] (Ankerstr. 3, CH-8406 Winterthur): *Iladig für en Libelelvortrag; — Anonymous*: Exhibit of some odonatalogical publications currently available in the market: list of titles, with prices and addresses of the publishers (4 pp.); — United States odonatological doctoral dissertations 1971-1980 (2 pp.). — For the Abstracts of Papers and for the description of the Field Trips cf. *OA* Nos 3400 and 3421 resp. For other publications of the Symposium cf. *OA* Nos 3153, 3400, 3421 and for the press reports *OA* Nos 3399, 3409, 3436, 3437, 3455.

- (3451) RETTIG, K., 1981. Beitrag zur Vogel- und Insektenwelt im Raum Nauders/Tirol. *In: K. Rettig, Beiträge zur Vogel- und Insektenwelt Ostfrieslands und der Alpen*, pp. 8-13. Privately published. — (Danziger Str. 11, D-2970 Emden, GFR).

Coenagrion hastulatum, *Erythromma najas*, *Aeshna coerulea*, *A. grandis*, *A. juncea*, *Somatochlora metallica* and *Leucorrhinia dubia* are recorded from Schwarzer See nr Nauders (alt. 1721 m), North Tyrol, Austria (July 13-22, 1981). The high-altitude record of *E. najas* is of particular interest.

- (3452) RETTIG, K., 1981. Zum Vorkommen einiger Insektenarten in Ostfriesland. Teil VI. *In: K. Rettig, Beiträge zur Vogel- und Insektenwelt Ostfrieslands und der Alpen*, pp. 1-7. Privately published. — (Danziger Str. 11, D-2970 Emden, GFR).

Distributional records are given for 19 odon. spp. from various localities in Eastern Frisia, German Federal Republic.

- (3453) RÖSLER, O., R. ROHN & L. ALBAMONTE, 1981. *Libellula permiana* do Estado de São Paulo, Brasil (Formação Irati): *Gondvanoptilon brasiliense* gen. et sp. nov. [A Permian dragonfly from the State of São Paulo, Brazil (the Irati Formation): *Gondvanoptilon brasiliense* gen. et sp. nov.] *Anais 2 Congr. Latino-Amer. Paleontol., Porto Alegre*, pp. 221-232, 1 pl. incl. (Port., with Engl. s.). — (Inst. Geocienc., Univ.

- São Paulo, São Paulo, Brazil).
Gondvanoptilon brasiliense gen. n., sp. n. (Permodonata, Protanisoptera, Permaeschnidae) from the Irati Formation, Upper Permian of the Passa Dois Group, Paraná Basin is described and illustrated. The locality (Pedrera da Mineração Amaral Machado) is an open mine, 19 km S of Piracicaba, São Paulo, Brazil. The holotype, deposited in the Inst. Geociências, Univ. São Paulo, is the only specimen recovered, and consists of an almost complete left hindwing. The affinities of the genus are discussed.
- (3454) SAUER, F., 1981. Im Gespräch: die Bundesartenschutzverordnung. *Tier + Naturfotografie* 12 (5): 4. — (c/o Editors: Münsterstr. 71, D-4402 Greven-1, GFR).
 The *OA* are unable to list the several dozens of critical comments that have appeared in the German press within the first yr after the publication of the disreputable German Species Conservation Act (cf. *OA* No. 3112), and many of which make clear that the Act is considered by numerous outstanding workers as the most serious blow yet dealt to insect conservancy in Germany. This is also the opinion of the author of the present Editorial. A reference is made to dragonflies, and the negative effects of the Act are point-wise analysed.
- (3455) SCHIESS, H., 1981. Libellen — Kleinodien unserer Gewässer. In Graubünden kommen 44 Libellenarten vor, darunter einige Raritäten. *Bündner Zig, Chur* 105 (196): 18-19 (Aug. 22). — (Brüglenstr. 1, CH-8345 Adetswil).
 An exhaustive general account on dragonflies in a local daily, with reference to dragonfly conservation and research in Switzerland. The article was written on the occasion of the Sixth International Symposium of Odonatology (cf. *OA* No. 3450) and the opening of a Dragonfly Exhibit in the Nat. Hist. Mus. in Chur, Switzerland.
- (3456) SEDLAG, U., 1981. Zum Aussterben von Tieren unter besonderer Berücksichtigung der Insekten. *Ent. Nachr.* 25 (1): 2-14. — (Danckelmannstr. 20, DDR-1300 Eberswalde-Finow, GDR).
 Contains a reference to the status of Odon. in the Federal Republic of Germany (Red List).
- (3457) SELLO, U., 1981. Documenti inediti e biografie per una "Storia della speleologia" (Friuli-Venezia Giulia). Alfredo Lazzarini. *Mondo sotterraneo, Udine* (N.S.) 5 (1): 7-14. — (Circolo speleologico e idrologico friulano, Via B.O. da Pordenone 3, I-33100 Udine).
 A brief biography, speleological bibliography and a portrait are provided of A. Lazzarini (born: July 6, 1871, Udine; deceased: March 30, 1945, Gorizia), schoolmaster and a Friulian (Italy) naturalist. Of local importance is his 1896 catalogue of the Odon. of Friuli (Pastorizia del Veneto, Nos. 20-23), reprinted in 1897 (Catalogo di ortotteri e neurotteri del Friuli; Doretti, Udine, 30 pp.).
- (3458) SELYSIA. *A Newsletter of Odonatology*. Compiled by M.J. Westfall & M.S. Westfall, Dept. Zool., Univ. Florida, Gainesville, Fla. Vol. 10, No. 2 (Sept. 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).
Westfall, M.J. (address above): Seventh (1983) International Symposium of Odonatology (10); — *Kiauta, B.* (Dept. Anim. Cytogenet. & Cytotaxon. Univ. Utrecht, Padualaan 8, Utrecht, NL): New national odonatological associations (10-12); — *Gloyd, L.K.* (Div. Ins., Mus. Zool., Univ. Michigan, Ann Arbor, Mich. 48104, USA): A suggested alert for the intermediate stage of Cestodes in nymphs of the Odonata (12); — *Tyagi, B.K.* (Malaria Res. Cent., UGH 61-70/Sect. VI, Ukai-394680, Distr. Surat, Gujarat, India): Dragonfly crisis in some parts of India (12-13); — Dun Valley Odo-

- nata for overseas scholars (13); — *Clark, V.H.* (Mus. Nat. Hist., Coll. Idaho, Caldwell, Idaho 83605, USA): Odonata in ecological research Baja California, Mexico (14); — *Johnson, D.* (Biol. Sci., Box 23590 A, East Tennessee St. Univ. Johnson City, Tenn. 37614, USA): North American Benthological Society Meeting (14); — [*Chao, H.-f. & B. Kiauta*] (Dept. Plant Prot., Fujian Agric. Coll., Fujian P.R. China): A note from China (14); — (*Anonymous*): [British] Odonata Recording Scheme notes (14-15); — Dr. Pinhey leaves Africa (15); — Honors for Dr. Machado (15); — Dr. Thomas Donnelly becomes Department Chairman (15); — S.I.O. member completes Ph.D. degree (15); — Recent Florida visitors (16); — *De Marmels, J.* (Entomologia, Postgrado, Ap. 4579, Inst. Zool. Agric., Fac. Agron., Univ. Central de Venezuela, Maracay-2101-A, Venezuela): Reprints of dr. J. Rácenis (16); — (*Anonymous*): PIFON, a new permanent international file of naturalists (16-17); — Odonata mugs for sale (17); — Note from the Editor (17).
- (3459) SHIMIZU, N., 1981. Brief observation of *Polycanthagyna melanictera* Selys (Aeschnidae). *Nature and Insects* 16 (9): 27-28. (Jap., with Engl. title). — (2-29 Nijo-cho, Minami-ku, Nagoja, 457, JA). Males of *P. melanictera* follow females at a lower height. This behaviour is compared with that of *Aeshna nigroflava* and *Anax parthenope*.
- (3460) SPÄH, H., 1981. Beitrag zur Kenntnis der Wirbellosen-Fauna (Invertebrata) einiger Bäche des Wiehengebirges (West Niedersachsen). *Beitr. Naturk. Niedersachs.* 34 (2): 77-91. — (Fak. Biol., Univ. Bielefeld, Universitätsstr., D-4800 Bielefeld, GFR). *Calopteryx splendens* is the only odon. sp. recorded (Westermoorbach, nr Schleddehausen, western Lower Saxony, German Federal Republic).
- (3461) STEBAEV, I.V., 1981. Opyt sopryazhenogo izucheniya ekologii i povedeniya nasekomykh v prirode i laboratorii. I. (An attempt of parallel studies of the ecology and behaviour of insects in the field and laboratory. I) *Ent. Obozr.* 60 (1): 77-91. (Russ., with Engl. title). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk). The field methods of "topographic mapping" of insect behaviour, incl. that of Odon., are described, and the technique of the registration of dragonfly behavioural patterns by means of ethograms are outlined.
- (3462) STEWART, A.G., 1981. Juvenile Great Skua eating insects. *Brit. Birds* 74 (9): 398. — (31 St Andrew's Ave., Prestwick, Airshire, KA9 2DY, UK). The Great Skua (*Stercorarius skua*) was noticed feeding on adult Zygoptera (East Bovey Hill, Dartmoor, Devon, UK; Sept. 4, 1978). The author is not aware of any earlier record of Great Skuas eating insects.
- (3463) STUBBS, A.E., 1981. Cyril Oswald Hammond. *Proc. Trans. Br. ent. nat. Hist. Soc.* 14 (1/2): 40-43, portrait incl. — (Author's address not stated). Extensive obituary and evaluation of the odonotol. work of C.O. Hammond. Born: Oct. 24, 1903, King's Lynn, UK; school Deputy Headmaster in north London; deceased: Aug. 23, 1980. The late Mr Hammond held honorary membership in all 3 British national entomological societies.
- (3464) TESTARD, P., 1981. Odonates. In: J.-R. Durand & C. Lévêque, [Eds], Flore et faune aquatiques de l'Afrique sahélo-soudanienne, vol. 2, pp. 445-481, Collins Initiat.-Documns techn. 45, Office Rech. Sci. Techn. Outre-Mer (O.R.S.T.O.M.), Paris. — (Lab. Zool., École Normale Sup., 46 rue d'Ulm, F-75230 Paris). A general introduction on the morphology of the order, based on examples of the Sahelo-Sudanese fauna, is followed by keys (adults and larvae) to the regional families, and by chapters on regional biogeography and on biology and ecology (life-history, habitat, nutrition, parasitism and predation,

- reproduction). The bibliography contains 64 titles.
- (3465) UTZERI, C., 1981. La libellula va a nozze. *Airone* 1981 (4): 58-69. — (Ist. Zool., Univ. Roma, Viale dell'Università 32, I-00100 Roma).
- A talk on dragonfly reproductive behaviour, directed at the general reader. The text is illustrated by 15 col. photographs.
- (3466) VALTONEN, P., 1981. *Aeschna viridis* Eversm. (Odonata) — Etelähämäläinen sudenkorentoharvinaisuus. (*Aeschna viridis* Eversm. (Odonata) — eine seltene Libelle in Süd-Häme). *Lounais-Hämeen Luonto* 66: 62-66. (Finnish, with Germ. s.). — (Dept. Electr. Eng., Tampere Univ. Technol., P.O. Box 527, SF-33101 Tampere-10, Finland). The hitherto known Finnish records of the Stratiotes-associated *Aeschna viridis* are reviewed, notes are presented on its "twilight swarming" behaviour, and some conservation measures are briefly discussed.
- (3467) WATERSTON, A.R., 1981. The dragonflies (Odonata) of Dhofar. *J. Oman Stud.* (Spec. Rep. No. 2) [1980]: 149-151, folded col. map excl. — (41 Heriot Row, Edinburgh EH3 6ES, Scotland, UK).
- 14 spp. are listed from the mountain region of Dhofar, southern province of Oman; 5 of these are recorded from the Arabian peninsula for the first time (*Ischnura senegalensis*, *Enallagma somalicum*, *Orthetrum sabina*, *Rhyothemis semihyalina*, *Urothemis edwardsi*).
- (3468) WILDERMUTH, H., 1981. Lebensraum Kiesgrube. *Schweizer Naturschutz* So-Nr. 2/81, IV + 24 pp. — Available, at sFr 1.80, from Schweizerischer Bund für Naturschutz, Postfach 73, CH-4020 Basel. — (Author's address: Mythenweg 20, CH-8620 Wetzikon).
- An attractive pamphlet on the origin, typology, flora, fauna, utilisation and conservation of gravel pits in Switzerland. It is emphasized that about 40 odon. spp. were so far recorded from gravel pits, hence these are considered among the most valuable odon. habitats in Switzerland. (For the odon. fauna of some Swiss gravel pits cf. *OA* Nos 17, 1449).
- (3469) WINSTANLEY, W.J., 1981. The distribution and abundance of *Procordulia grayi* (Selys) (Odonata: Corduliidae) in New Zealand. *Tuatara* 25 (1): 14-22. — (Dept. Zool., Victoria Univ., Private Bag, Wellington, NZ).
- There are suggestions in the literature that *P. grayi* is a rare or local sp., that it is subalpine in its distribution and that its larvae compete better in colder lakes and streams. However, the combined use of museum material, field observations and literature records shows *P. grayi* to be a dragonfly which is widespread in its latitudinal and altitudinal distribution and indicates that cold-adaptation in its larvae cannot be substantiated. (Author). — (*Abstracter's Note*: The author has drawn the Abstracter's attention to the fact, that the printer has rotated fig. 2 (p. 18) 180°. The caption should now read: "Terminal appendages of the New Zealand Corduliidae. Females above, males below. Left to right: *Procordulia smithii*, *P. grayi*, *Hemicordulia australiae*, *Antipodochlora baueri*. Scale line represents 1 mm").
- (3470) WINSTANLEY, W.J., 1981. An emergence study on *Uropetala carovei carovei* (Odonata: Petaluridae) near Wellington, New Zealand, with notes on the behaviour of the subspecies. *Tuatara* 25 (1): 22-36. — (Dept. Zool., Victoria Univ., Private Bag, Wellington, NZ).
- Collections of final-instar exuviae of *U. c. carovei* from 6 sites nr Wellington (Jan-Mar 1980) showed that the emergence duration is similar to that in *U. c. chiltoni* in the South Island, but it commenced and finished later in the season at the sites studied. The study reveals a slight preponderance of males over females (54%). — As has been described for all petalurids, with the exception of *U. c. chiltoni*, the rectal plates in all exuviae have been found to be open distally. The emergence stance, incl. novel aspects of the

larva's attachment to the emergence support, is described and notes are incorporated on oviposition, habitat and larval behaviour. (Author).

- (3471) WINSTANLEY, W.J., C.H. WINSTANLEY & R.S. GORDINE, 1981. Emergence behaviour of *Uropetala carovei carovei* (Odonata: Petaluridae) in New Zealand. *N.Z. J. Zool.* 8: 409-411. — (Zool. Dept., Victoria Univ., Private Bag, Wellington, NZ).

The sequence and timing of events in the emergence of *U. c. carovei* are described. Contrary to earlier published opinion, emergence is shown to be of the 'upright type', seen also in the petalurids *Tanypteryx pryeri* and *Tachopteryx thoreyi*. The accuracy of accounts of 'hanging-type' emergence behaviour in *Petalura gigantea* and *Tanypteryx hageni* is questioned. (Authors).

- (3472) WOOTTON, R.J., 1981. Support and deformability of insect wings. *J. Zool., Lond.* 193 (4): 447-468. — (Dept. Biol. Sci., Univ. Exeter, Exeter, Devon, EX4 4PS, UK). Coupled investigations of insect wing movements and detailed wing morphology are in progress, and some functional principles

underlying wing design are emerging. High-speed cine and still photography and stroboscopy indicate that most wings undergo orderly deformation in flight. Common patterns are described and their significance discussed in the light of recent aerodynamic studies. Many aspects of wing morphology — venational features, relief, thickened areas, flexionlines and vein fractures — may be related to the control of three-dimensional shape while beating. It is usually possible to distinguish areas specialized for deformability, and for support and the limiting of deformation. Some structural adaptations for these roles are described and illustrated. (Author). — The Odon. are considered where appropriate.

- (3473) ZHOU, Wen-bao, 1981. A new species of the genus *Caconeura* from Chekiang (family Protoneuridae). *Acta ent. sin.* 24 (1): 61-62. (Chinese, with Engl.s.). — (Chekiang Mus., Hang Zhou, P.R. China). *C. longjingensis* sp. n. (♂ holotype, ♀ allotype, paratypes of both sexes: Hangchow, Longjing, Chekiang, China; 15-VII-1966) is described and illustrated. It is related to *C. dorsalis auricolor* Fraser. Material is deposited in the Chekiang Mus.