ODONATOLOGICAL ABSTRACTS

1971

(6637) DEUTSCHER JUGENDBUND FÜR NATURBEOBACHTUNGEN, 1971. Drei Libellenarten (Archiptera) im Hamburger Raum ausgestorben. *Schr. ArbKr. naturw. Heimatf. Wedel* 7(1): 29.
In the Hamburg area, Gomphus vulgatissimus, Ophiogomphus serpentinus and Stylurus flavipes appear extinct, hence they should be removed from the regional list.

1974

(6638) *AESCHNA*. Published by the Tombo Kenkyukai [= Dragonfly Research Group], Osaka, Vol. 1, No. 1 (Oct. 29, 1974), No. 2 (Dec. 25, 1974). (Jap.). — (c/o A. Muraki, 476-2-4-1312, Kano, Higashi-Osaka, 578, JA).
A cheaply produced, but highly interesting semiannual journal of the small odonatol. society of Osaka, Japan, dealing mainly with various aspects of the local fauna, but also containing papers on non-Japanese Odonata. — Contents, No. 1: *Muraki, A.:* On the three species of Stylurus, pt 1 (pp. 1-4); — *Yoshida, K.:* Record of the activity of our Group during summer and early autumn, 1974 (pp. 4-8); — [*Muraki, A.*]: The 1973 records (pp. 8-10; Jap. nomenclature); — *Masaki, N.:* Records from a collecting trip to Okinawa (pp. 10-14; Jap. nomenclature); — [*Muraki, A.*]: Notes on interesting specimens collected on Oct. 20, 1974 (pp. 14-15; Jap. nomenclature, with figs); — *Muraki A.:* Interesting literature (pp. 15-16); — A letter from Mr Matsumoto (p. 16). — No. 2: *Muraki, A. & K. Kitagawa:* Report of the survey trip to Hokkaido (pp. 17-34; mostly Latin nomenclature, with numerous phot. of specimens and habitats); — *Muraki, A.:* Additions to the "Interesting literature" (p. 35).

1975

(6639) *AESCHNA*. Published by the Tombo Kenkyukai [Dragonfly Research Group], Osaka, Vol. 2, No. 1 (Apr. 26, 1975), No. 2 (July 21, 1975). (Jap.). — (c/o A. Muraki, 476-2-4-1312, Kano, Higashi-Osaka, 578, JA).
No. 1: [*Muraki A.*]: Report on the 1974 surveys (pp. 1-19; Latin nomenclature, with tabs and graphs); — Short Communications [from the Editors] (pp. 20-21); — Answer from Dr S. Asahina on the dark Sympetrum parvulum (p. 21). — No. 2: *Hashimoto, S.:* Mate refusual in Sympetrum darwinianum (p. 22); — *Muraki, A.:* Dragonflies of New Guinea (Lae) taken by Hiroshi Endo (pp. 22-27; list of 27 spp.); — *Muraki, A.:* Dragonflies of Shirakawa-mura, Gifu Prefecture (pp. 27-30; Jap. nomenclature); — [Muraki, A.]: Short Communications, II [from the Editors] (pp. 31-36; with figs); — From the Editors (pp. 36-37).

1982

(6640) KELCEY, J.G., 1982. Ecological aspects of the urbanization of a canal. *In:* R. Bornkamm, J.A. Lee & M.R.D. Seaward, [Eds], Urban ecology, pp. 231-242, Blackwell, Oxford-London - Edinburgh - Boston - Melbourne, ISBN 0-632-00943-8. — (Milton Keynes Develop. Corp., Wavendon Tower, Wavendon, Milton Keynes, UK).

Milton Keynes, North Buckinghamshire, UK, was designated a new city in 1967, and a programme of monitoring the effects of urbanization of the major ecocsystems that existed at the time of designation was set up. This includes the monitoring of the 20 km of the Grand Union Canal that runs through the city. A survey of the Odon. of the canal was carried out in 1979. It showed that 7 of the 14 spp. recorded in Milton Keynes breed in the canal, incl. Aeshna grandis and A. mixta. The canal is the only breeding site in the city for Libellula quadrimaculata.

1984

(6641) ALEXANDER, D.E., 1984. Two qualitatively different types of turns by flying dragonflies. *Am. Zool.* 24(3): 105 A [Abstract only]. — (Dept Biol., Bellarmine Coll., Newburg Rd, Louisville, KY 40205, USA).
[Verbatim]: Dragonflies were flown in a wind tunnel attached to tethers that allowed them to pivot about their roll and yaw axes. High-speed movies taken during turns show two different types of turn. "Conventional" turns are produced primarily by reducing the wing stroke amplitude on one side relative to the other, causing the insect to roll into a bank; the lateral component of the resultant lift vector causes the insect to turn in a similar fashion to a fixed-wing aircraft. In a "yaw" turn, the insect pivots about a vertical axis through its center of mass with no appreciable bank. These turns are associated with left-right differences in the stroke-plane angle and angle of attack. The conventional turn seems to be most effective during fast forward flight, and the yaw turn is most effective in slow flight and hovering.

(6642) ARAI, Y., 1984. [Mate refusal in female Polycanthagyna melanictera]. *Nature & Insects* 19(14): 30. (Jap.). — (1233-2 Sueno, Yorii-machi, Osato-gun, Saitama Pref., 369-12, JA).
August 17, 1984, 18.30 p.m., numerous individuals of both sexes of this crepuscular sp. were seen on wings. A male pursued a female, they got entangled, fell on the ground, and flew up in tandem. But the female bent the abdomen like in male's sperm transfer, and the couple fell down again. They flew up in this posture, but fell again. This is suggested to represent a case of copulation refusal.

(6643) ARAI, Y., 1984. [Non-contact sitting oviposition in Trigomphus melampus]. *Nature & Insects* 19(14): 30. (Jap.). — (1233-2 Sueno, Yorii-machi, Osato-gun, Saitama Pref., 369-12, JA).
Jue 16, 1984, a female flew over the surface of a pond and perced on the shore. It lifted the abdomen and trembled the wings. After 5 min it flew up and soon perched. This was repeated several times, and the author noticed the releasing of eggs while perched. — While non-contact flying oviposition is common in this sp., the described mode is here recorded for the first time.

(6644) BAN, R. & Y. BAN, 1984. [An autochthonous population of Aeshna juncea in the lowlands of Aichi Prefecture]. *Nature & Insects* 19(14): 29-30. (Jap.). — (23-8, Miyamae, Nakabata-cho, Nishio, Aichi Pref., 444-03, JA).
At Kota-cho, a larva was taken in Apr., 1984; it emerged in July. Numerous exuviae, 32 larvae (20 mm long) and 5 larvae (10 mm long) were recorded on Aug. 2, when 2 adults were also seen.

(6645) EDA, S., 1984. [Iconographic works on dragonflies, PT 8]. *Nature & Insects* 19(1): 28-31. (Jap.) — (3-4-25, Sawamura, Matsumoto, 390, JA).
Continuation of the series listed in *OA* 5463. — The present paper deals with 11 Jap. books published 1970-1975, in which Odon. are covered along with other insect orders. — (*Abstracter's Note:* Due to difficulties in obtaining Jap. literature, none of these were listed in *OA*).

(6646) EDA, S., 1984. [Iconographic work on dragonflies, PT 9]. *Nature & Insects* 19(4): 26-29. (Jap.). — (3-4-25, Sawamura, Matsumoto, 390, JA).
Continuation of the series listed in *OA* 6645. — The present paper deals with 13 Jap. books published 1976-1980, incl. those listed in *OA* 2562 and 3015. The others are apparently not

devoted exclusively to Odon.

(6647) EDA, S., 1984. [Iconographic works on dragonflies, Pt 10]. *Nature & Insects* 19(5): 30-33. (Jap.). — (3-4-25, Sawamura, Matsumoto, 390, JA).
Continuation of the series listed in *OA* 6646 and concluding account on the Jap. titles. — 5 books (1981-1983) are described (incl. those listed in *OA 4257* and *5410).* 3 previously omitted titles (1942-1955) are added, and notes on 7 children's books are appended.

(6648) EDA, S., 1984. [Iconographic works on dragonflies, Pt 11]. *Nature & Insects* 19(6): 26-29. (Jap.). — (3-4-25, Sawamura, Matsumoto, 390, JA).
Continuation of the series listed in *OA* 6647; dealing with 10 foreign works (1883-1936), incl. *Selys* (1883, Japon), *Lucas* (1900, Br. dragonflies), *Tümpel* (1901, Geradflügler), *Needham & Heywood* (1929, Handb. N. Amer.), *Needham* (1930, Manual China), *Lucas* (1930, Br. larvae), *May* (1933, Tierw. Dtl.) and *Fraser* (1933-1936, Br. India).

(6649) EDA, S., 1984. [Iconographic works on dragonflies Pt 12, final]. *Nature & Insects* 19(8): 27-31. (Jap.). — (3-4-25, Sawamura, Matsumoto, 390, JA).
The concluding paper of the series listed in *OA* 6648 deals with 14 foreign works (1937-1977), incl. *Longfield* (1937, Br. Isls), *Needham & Gyger* (1937, Philippines), *Fraser* (1919, Handb. Br. insects), *Walker* (1953, 1958, Canada & Alaska), *Needham & Westfall,* (1955, Manual N. Amer.), *Fraser* (1956, Anisopt. Madagascar), *Conci & Nielsen* (1956, Fauna d'Italia), *Robert* (1958, Libellules), *Corbet, Longfield & Moore* (1960, Dragonflies), *Fraser* (1960, Handb. Australasia), *Pinhey* (1961, Surv. E. Africa), *Aguesse* (1968 Europe Occid.), and *Hammond* (1977, Gr. Br. & Ireland). The Jap. work listed in *OA* 4592 is added.

(6650) INOUE, K., 1984. [My encounter with insects]. *Nature & Insects* 19(10): 34. (Jap.). — (5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
Autobiographic note by one of the greatest Jap. odonatologists; with a portrait. Born 1932. — His father and elder brother collected insects, but these were donated to a newly established primary school. He enjoyed looking at illustrated insect books and many dragonfly spp. occur nr his home. In 1950, he was inspired by Asahina's work in *Iconographia insectorum japonicorum.* His first noteworthy record was that of Aeshna juncea at Mt Koya (1951), representing the southeastern limit of its range. In 1957 he discovered the larva of Stylurus annulatus. It was largely due to Dr S. Asahina's encouragement that he specialised in odonatology.

(6651) ISHIZAWA, N. & T. KOBAYASHI, 1984.Odonate fauna of Yamanashi Prefecture, 3rd report. *Nature & Insects* 19(10) 27-28. (Jap., with Engl. title). — (First Author: 1644--15 Yamaguchi, Tokorozawa, Saitama Pref., 359, JA).
10 spp. are mentioned from 3 localities. Japanese vernacular nomenclature only.

(6652) KARUBE, H., 1984. [Adult Aeshna juncea taken in Kanagawa Prefecture]. *Nature & Insects* 19(1): 35. (Jap.). — (1-7-34, Tsurumi Tsurumi-ku, Yokohama, 230, JA).
1 ♀ (Aug. 20, 1983), 1 ♂ (Aug. 30, 1983) and 1 ♂ (Oct. 2, 1983) are listed from Sengoku-hara, Hakone-machi.

(6653) KOBAYASHI, T., 1984. [Mnais pruinosa with aberrant pterostigma]. *Nature & Insects* 19(14): 34. (Jap.). — (Lion Co., Nonomiya--ryo, 457, Yamanishi, Ninomiya-machi, Naka--gun, Kanagawa Pref., 259-01, JA).
A female M. p. pruinosa with a dark spot in the centre of the left forewing pterostigma was taken nr Ohno Reservoir, Yamanashi Pref., June 24, 1984. The aberration is described and figured.

(6654) LAMBELET, J., 1984. Nouvelles localités pour quatre odonates de France. *Entomologiste* 40(4): 168. — (Hôtel de Ville, F-48300 Langogne).
Records are presented of Crocothemis erythraea, Orthetrum albistylum, Sympetrum

danae and S. pedemontanum.

(6655) MATSUKI, K., 1984. Notes on the little known gomphid dragonflies of Taiwan. *Nature & Insects* 19(4): 14-17. (Jap., with Engl. title). — (2-6-2-305, Fujisaki, Narashino, Chiba Pref., 275, JA).
Mainly due to the works of S. Asahina, 30 spp. and sspp. pertaining to 19 gomphid genera are known from Taiwan. Gomphus takashii and G. perlaetus are known only from ♀, while Sieboldius deflexus and Gomphidia krugeri fukiensis are known only from ♂. The larvae of G. takashii and G. pacificus are unknown, and those of Fukienogomphus prometheus, Gomphidia confluens and G. k. fukiensis are unknown from Taiwan. G. perlaetus and F. prometheus are in need of revision.

(6656) MATSUKI, K. & A. YOSHITANI, 1984. The movements of the antennae of the dragonflies larvae in feeding. *Nature & Insects* 19(13): 24--25. (Jap., with Engl. title). — (First Author: 2-6-2-305, Fujisaki, Narashino, Chiba Pref., 275, JA).
The final instar of Stylogomphus suzukii and the penultimate instar of Planaeschna milnei were studied. Before catching the prey, the antennae were held parallel or slightly opened and in a somewhat downward position. At the moment of grasping, they were widely open, and continued so during the backward bending of the labium and while chewing. They were returned to an almost parallel position when the larva cleaned the mouth.

(6657) NEGORO, T., 1984. [Trithemis aurora taken on Kuma Island, Okinawa Prefecture]. *Nature & Insects* 19(13): 34. (Jap.). — (c/o Toyama Municipal Sci. & Cult. Centre, 3-1-19 Nisjinakano-machi, Toyama, 930-11, JA).
First record from the island (1 ♀, Sept. 8, 1984).

(6658) NISHIKAWA, Y., 1984. [Minoo is recovering its natural environment, 1984]. *Nature & Insects* 19(14): 37. (Jap.). — (1-8, Minoo 6--chome, Minoo, Osaka Pref., 562, JA).
The Minoo area, Osaka Prefecture, used to be one of the 3 most famous insect observation sites in Japan. The author is monitoring to the development of its fauna. Since the 1950s the fauna was considerably damaged by the excessive application of agricultural chemicals, and has been further destroyed by the enormous development of residential housing. In 1984, however, the ecological situation seems to have somewhat stabilised, and Lyriothemis pachygastra, Gynacantha japonica and Rhyothemis fuliginosa occur there again.

(6659) OBANA, S., 1984. [My encounter with insects]. *Nature & Insects* 19(11): 31. (Jap.). — (Author deceased on July 12, 1988).
Autobiographic note, with a portrait. The late Dr Obana is particularly well known for his breeding of many Jap. odon. spp.

(6660) OGASAWARA, H., 1984. [Anax n. nigrofascinatus and Anotogaster sieboldi taken in Setagaya-ku, Tokyo]. *Nature & Insects* 19(14): 12--13. (Jap.). — (3-19-5, Higashi-sugano, Ichikawa, 272, JA).
Records from the Tokyo urbanized area.

(6661) ONO, s., 1984. [A teratological specimen of Sympetrum darwinianum from Hiraizumi, Iwate Prefecture]. *Nature & Insects* 19(14): 33. (Jap.) — (105 Aza Tanaka, Ura-machi, Kaminoyama, Yamagata Pref., 999-31, JA).
A female with much shrunken abdomen is described and figured.

(6662) SATO, Y., 1984. The mass flight of dragonflies (Sympetrum frequens). *Nature & Insects* 19(8): 14-16. (Jap., with Engl. title). — (3-17--16, Narita-nishi, Suginami-ku, Tokyo, 166, JA).
Countless tandem pairs were seen (Oct. 11, 1982; 09-12 a.m.) swarming over temporary puddles and ovipositing nr the Misawa Airport, Aomori Pref. 5 ♀ laid 2167, 916, 2172, 1905 and 1512 eggs, resp. In the afternoon the tandems separated and performed a mass flight in the evening.

(6663) SHIRAISHI, K., 1984. [A note on the behaviour of Anaciaeschna jaspidea in Okinawa Island]. *Nature & Insects* 19(3): 39. (Jap.). — (1-612, Ikebukuro, Toshima-ku, Tokyo, 170,

JA).
3 ♂ of this crepuscular sp. were seen flying during daytime (Nov. 3, 1983) low over an abandoned rice field, presumably looking for females.

(6664) SHIRAZAWA, R. & S. EDA, 1984. [Tramea transmarina euryale migrated to Nagano Prefecture]. *Nature & Insects* 19(9): 34. (Jap.). — (First Author: 6305 Kamisakae-cho, Omachi, Nagano Pref., 398, JA).
In the paper listed in *OA* 5464, 24 ♂ T. virginia were reported taken in Nagano. Subsequent checking of the photographic record made at that occasion revealed that 1 of these was T. t. euryale (Aug. 2, 1983).

(6665) SONEHARA, I., 1984. [My encounter with insects]. *Nature & Insects* 19(6): 25. (Jap.). — (Tazawa 5035, Toyoshima-machi, Minamiazumi-gun, Nagano Pref., 399-82, JA).
Autobiographic note by this well known Jap. odonatologist; with a portrait.

(6666) SUGIURA, M., 1984. [Dragonflies of the northern part of Chigasaki, Kanagawa Prefecture]. *Nature & Insects* 19(9): 34. (Jap.). — (Author's address not stated).
18 spp. are listed; Japanese vernacular nomenclature only.

(6667) TAKETO, A., 1984. [Aeshna mixta in Ishikawa Prefecture]. *Nature & Insects* 19(14): 13-14. (Jap.). — (3-21 Ishibiki 2-chome, Kanazawa, 920? JA).
A ♂ taken at a marsh, Sept. 23, 1984.

(6668) TAKETO, A., 1984. [On two dragonfly species from Fukui Prefecture]. *Nature & Insects* 19(14): 14. (Jap.). — (3-21 Ishibaki 2-chome, Kanazawa, 920, JA).
Davidius moiwanus: 6 ♂, 22-V-1983; — Sinogomphus flavolimbatus: larva, 25-VIII-1984.

(6669) TANAKA, A., 1984. [Trithemis aurora tends to prevail in Okinawa-honto Island]. *Nature & Insects* 19(14): 13. (Jap.). — (No. 301, Ashikawa Green Heights, 3-63-2, Shimo-ishihara, Chofu, Tokyo, 182, JA).
July 1-2, 1984, 14 ♂ and 2 ♀ were observed in 2 localities.

(6670) URATA, A., 1984. [Two insect species from Nagasaki Prefecture]. *Nature & Insects* 19(14): 13. (Jap.). — (98 Miyadani, Izuhara-cho, Shimoagata-gun, Nagasaki Pref., 817, JA).
Polycanthagyna melanictera, 1 ♀, Izugara-cho, 11-VI-1984.

(6671) WAKANA, I. & Y. WAKANA, 1984. [Two dragonfly species recorded in Chiba Prefecture]. *Nature & Insects* 19(13): 34. (Jap.). — (1-654-9 Kami-skakujii, Nerima-ku, Tokyo, 177, JA).
First prefectural records of Sympetrum s. speciosum and S. croceolum.

(6672) YAMADA, K., 1984. [Erythromma najas baicalense taken at Lake Tofutsu, Hokkaido]. *Nature & Insects* 19(14): (Jap.). — (110 Kitahama, Abashiri, 099-31, JA).
3 ♂, 3 ♀, 30-VI-1984.

1985

(6673) BARCLAY, R.M.R., 1985. Long- versus short-range foraging strategies of hoary (Lasiurus cinereus) and silver-haired (Lasionycteris noctivagans) bats and the consequences for prey selection. *Can. J. Zool.* 63(11): 2507-2515. (With Fr. s.). — (Dept Biol., Univ. Calgary, Calgary, Alberta, T2N 1N4, CA).
Habitat use, temporal activity, foraging behaviour and prey selection of the 2 bat spp. were studied at Delta Marsh, Manitoba, Canada. In L. cinereus the diet consists primarily of large Lepidoptera, Odon. and Coleoptera. Quantitative data are stated.

(6674) COPPA, G. & A. GRAFTEAUX, 1985. Présence de Somatochlora arctica (Zetterstedt, 1840) dans le département des Ardennes (Odonata, Corduliidae). *Bull. Soc. Hist. nat. Ardennes* 75: 30-32. — (Les vieilles Censes, Elan, F-08160 Flize).
A population of S. arctica is recorded from the marsh of the Gué d'Hossus, Dép. Ardennes, France (alt. 308 m). The habitat is described, and the vegetation and the odon. fauna of this

locality are stated along with the meterological conditions during the adult season (July--Aug.).

1986

(6675) LÖHR, P.-W. & J. BREHM, 1986. Die Libellen eines neuangelegten Gartenweihers im Vorderen Vogelsberg. *Beitr. Naturk. Osthessen* 22: 105-117. — (First Author: Burgwaldstr. 15, D-6315 Mücke, FRG).
The succession of the odon. fauna in a man--made garden pond (Oberhessen, FRG) was followed during the 2nd and 3rd yrs after its completion, and daily temperature, pH, O_2, etc. variations were measured in the 3rd yr. The list contains 20 spp., of which 14 occurred during the 2 yrs of systematic observations, while the breeding of 8 of them is documented by exuviae. The succession status of each sp. is discussed in detail.

(6676) LONGLEY, A.J. & R.D. LONGLEY, 1986. Serotonin immunoreactivity in the nervous system of the dragonfly nymph. *J. Neurobiol.* 17(4): 329-338. — (Pacific Sci. Inst., P.O. Box 835, Friday Harbor, Wash. 98250, USA).
Serotonin-like immunoreactivity was mapped using an antiserotonin antibody in whole-mounts of the ventral nerve cord from dragonfly nymphs (Epitheca sp. and Pachydiplax longipennis). In both species, an immunoreactive cell ventral to each connective tract and an immunoreactive median cell cluster on the ganglion ventral surface were found in the unfused abdominal ganglia. Axon(s) from the median cell cluster branch in the anterior unpaired median nerve. Posterolaterally, in all of the ganglia examined, two or more intensely immunoreactive, bilaterally symmetric pairs of neurons were seen. Comparison of these posterolateral neurons, which appear to be serially homologous, with similar antiserotonin immunoreactive neurons described in other insects suggests that these neuron pairs may have cross-species homology as well.

(6677) MOLA, L.M. & S.S. AGOPIAN, 1986. Ocurrencia de complementos cromosomicos reducidos en libelulidos (Odonata). *Resum. XVII Congr. Argent. Genet., Córdoba*, p. 25. [Abstract only]. — (Salta 1629, 3'A, AR-1137 Buenos Aires).
While the chromosome type number, n=13, is a characteristic of the modern odon. families, in the geologically ancient groups a reduction of the chromosome number occurs frequently. In the modern Libellulidae only 17% of the taxa studied show such a reduction. Here listed are Erythrodiplax minuscula (n=11, *m*, neo--XY), Orthemis ferruginea and Oligoclada laetitia (both n=12, *m*, XO).

1987

(6678) BANSE, W., 1987. Libellen. *In:* G. Ritter, [Ed.], Vegetationskundliche und faunistische Untersuchung zur Beweissicherung Bundesautobahn A92 München-Deggendorf, Neubau von Freising bis Langenpreising, pp. 80-82, 109-111 (cumulative references), Appendix 5, Ges. f. Landeskultur, München. — (Publisher: Ges. Landeskultur, Zweigniederlassung München, Balanstr. 138, D-8000 München-90, FRG).
11 spp. are recorded from 6 localities in the Viehlassmoos (Bavaria, FRG). On the basis of cluster analysis, similarities in the odon. faunae of these are stated.

(6679) BARVAUX, E., 1987. Contribution à l'étude des odonates des Hautes Fagnes. *Revue verviétoise Hist. nat.* 1987 (2): 30-41. — (75 av. J. Tasté, Heusy, Belgium).
In the 1950's and early 1960's the author was well known by his numerous papers on the odon. fauna of his native region, the Hautes Fagnes, in Belgium. After a break of more than 20 years, he has now returned to this subject, discussing briefly 22 spp., among which records of Coenagrion hastulatum, Aeshna subarctica elisabethae and Somatochlora arctica are of particular interest.

(6680) HILSENHOFF, W.L., 1987. An improved biotic index of organic stream pollution. *Great Lakes Ent.* 20(1): 31-39. — (Dept Ent., Univ. Wisconsin, Madison, WI 53706, USA).
Major improvements were made in using a biotic index of the arthropod fauna to evaluate

organic stream pollution. All tolerance values were re-evaluated, many were changed, and the scale for tolerance values was expanded to 0-10 to provide greater precision. Several Odon. that were assigned tolerance values are essentially lentic and occur only occasionally in streams and rarely in riffles. They rarely made up more than 10% of a sample, therefore this order is usually not important to biotic index values.

(6681) JACQUEMIN, G., 1987. Les odonates de la Merja de Sidi Bou Ghaba (Mehdiya, Maroc). *Bull. Inst. scient., Rabat* 11: 175-183. (With Arab. & Engl. s's). — (Biol. Insectes, Univ. Nancy-I, B.P. 239, F-54506 Vandoeuvre-les--Nancy).
The odon. fauna (18 spp.) of this locality, 35 km NNE of Rabat, is biogeographically analysed, and the annual cycle of each sp. is outlined.

(6682) JACQUEMIN, G. & P. AGUESSE, 1987. Sur l'identité du représentant marocain du genre Pseudagrion Selys (Odonata, Coenagriidae). *Bull. Inst. scient., Rabat* 11: 185-186. (With Arab. & Engl. s's). — (Second Author: Dépt. Biol., Fac. Sci., Univ. Mohammed V, Charia Ibn Batouta, B.P. 1014, Rabat-Agdal, Morocco).
The identification of P. torridum, as reported in the paper listed in *OA* 5178, is corrected into P. sublacteum. This sp. has not been previously reported from northern Africa.

(6683) MACHADO, A., 1987. *Bibliografía entomológica canaria. – A bibliography of Canary Island entomology.* 295 pp. Inst. Estud. Canarios, La Laguna (Monogr. 34), ISBN 84-00--06508-5.
For the Odon., 25 titles are listed (pp. 191-193), covering the period 1810-1985.

(6684) MASTRANTUONO, L., 1987. Invertebrate community in the littoral-regulated area of a hydroelectric lake-reservoir (Lake Compotosto, central Italy). *Riv. Idrobiol.* 26(1/3): 17-32. (With Ital. s.). — (Dipto Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
Enallagma cyathigerum and Ischnura elegans are listed from the lake, alt. 1300 m.

(6685) MERRITT, R., 1987. Odonata. The dragonflies. *In:* D.B. Shirt, [Ed.], British Red Data Books, Vol. 2: Insects, pp. 4, 43-47. Nature Conservancy Council, Peterborough, ISBN 0-86139-380-5. — (Author: 38 New Rd, Holymoorside, Chesterfield, Derbys., S42 7EN, UK).
The book is compiled in the style of the *IUCN Red Data Book* (*OA* 4224). In the main text (pp. 43-47), 6 spp.are "monographically" dealt with, in the summary table (p. 4) the status of the following is listed: endangered: Coenagrion armatum, C. scitulum, Aeshna isosceles, Oxygastra curtisii; — vulnerable: Coenagrion hastulatum, Lestes dryas; — rare: Coenagrion mercuriale, Somatochlora arctica, Libellula fulva. These together amount to 22% of the British odon. fauna. Of the endangered spp., 3 probably became extinct in the 1950s. L. dryas was also thought to be extinct, but was rediscovered in 1983. Aeshna isosceles is on Schedule 5 of the Wildlife & Countryside Act 1981. — (*Abstracter's Note:* In Europe, the British odon. fauna is by far the most thoroughly explored, mapped and regularly monitored. Its status, expressed as % spp. in the first 3 categories of the National Red List, compares favourably with the European Continental fauna. Though the nomenclature of status categories in Britain is not entirely identic with that on the Continent (the above 3 IUCN categories being replaced by resp. "threatened with extinction", "highly threatened" and "threatened"), the figures for Switzerland (54%, *OA* 6135) and FR Germany (49%, *OA* 4462) are comparable. Aside from the internationally protected spp., listed in Appendix II of the Berne Convention (*OA* 6273), in Britain Aeshna isosceles is the only legally protected sp., while all Odon. are protected in FR Germany (*OA* 3112) and none, on the national level, in Switzerland (cf. also *OA* 6006, 6367). Whether or not a more thorough status examination of the Continental taxa will cause the removal of some of these from the national Red Lists remains to be seen. — The British Dragonfly Society, in conjunction with a number of local

organisations and institutions, is so far the only odonatol. organisation in Europe carrying out a systematic and well organized mapping scheme and reporting on the results in a specialised *Newsletter* (cf. *OA* 2341, 2384, 2574, 2848, 3316, 3782, 4332, 5901, 5947, 6400). The scheme is coordinated and the newsletter edited by the author of the present work. This example seems to be followed now by Ireland (*OA* 6382), and perhaps (?) by Switzerland (*OA* 6289). Some other countries operate computerized retrievals, but do not report regularly on the results).

(6686) MIURA, T. & R.M. TAKAHASHI, 1987. Impact of fenoxycarb, a carbamate insect growth regulator, on some aquatic invertebrates abundant in mosquito breeding habitats. *J. Am. Mosquito Control Assoc.* 3(3): 476-480. — (Mosquito Control Res. Lab., Univ. California, 9240 S. Riverbend Ave., Parlier, CA 93648, USA).
Fenoxycarb induced various morphogenetic aberrations in Anax junius and Pantala hymenaea after treatment of late larval instars. Most affected larvae died while moulting to adults. Quantitative data are stated and the aberrations are described and figured.

(6687) PAVLYUK, R.S. & T.M. KURBANOVA, 1987. O nekotoryh osobennostyah fauny strekoz (Insecta, Odonata) yuzhnyh rayonov Turkmenistana. — [On some peculiarities in dragonfly fauna (Insecta, Odonata) of the southern districts of Turkmenistan]. *Izv. Akad. Nauk turkmen. SSR* (Biol.) 1987 (3): 70-71. (Russ.). — Dept Invert. Zool., Lvov Univ., 4 Shcherebakov St., USSR-290005 Lvov).
Calopteryx splendens transcaucasica is endemic to Turkmenistan, USSR, and individuals are reported that were parasitised by the metacercariae of Prosthogonimus sp. Sympetrum meridionale is locally the most common sp. In comparison with the European populations, the Turkmenian individuals of some spp. are smaller and show variation in the pattern of body coloration.

(6688) PRASAD, M., R. RAM & S.K. GHOSH, 1987. Notes on the Indian species of the genus Pseudagrion Selys (Coenagrionidae: Odonata). *Bull. zool. Surv. India* 8(1/3): 313-321. — (Zool. Surv. India, M-Block, New Alipur, Calcutta-700053, India).
11 spp. are dealt with. P. andamanicum is for the first time recorded from the Indian mainland (Orissa).

(6689) WESTFALL, M.J., 1987. Order Odonata. *In:* F.W. Stehr, [Ed.], Immature insects, pp. 95--117, Kendall & Hunt, Dubuque, Iowa, ISBN 0-8403-3702-7. — (Dept Zool., Univ. Florida, Gainesville, Fla 32611, USA).
Family key, descriptions and figs are given for the odon. families of North America, the Mexican border states, the Greater Antilles and Hawaii. The concise and excellently styled family chapters are organised in 5 sections, viz. "Relationship and diagnosis", Biology and ecology", "Description", "Comments" and "Selected bibliography".

1988

(6690) ASAHINA, S., 1988. [Mr Ichiro Matsui in memoriam]. *Napi News* 218: 1 [2049]. (Jap.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
A brief obituary (born Apr. 1, 1921, deceased Dec. 17, 1987), with emphasis on his pioneer work in the field of distribution mapping of Japanese Odon. Matsui's "Tombo Dokokai" (Dragonfly Lovers' Association) was the first odonatological society ever set up.

(6691) ASAHINA, S., 1988. Notes on some North Indian Odonata in the collection of the University Zoological Museum, Copenhagen. *Trans. shikoku ent. Soc.* 19(1/2): 1-9. — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
13 spp. from northern India and Kashmir are dealt with. Nepogomphus modestus and Aeshna juncea mongolica are described and figured.

(6692) ASAHINA, S., 1988. Notes on two cordulegasterid dragonflies in the collection of Museum National d'Histoire Naturelle, Paris. *Proc. Japn Soc. syst. Zool.* 38: 31-36. — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169,

JA).
The author has visited the MNHN in 1973 and included some of the results of his Paris work in the papers listed in *OA* 940, 941, 1161 and 1801. In the present paper the little known W. Chinese Neallogaster luniferus (♂, "Thibet") and Anotogaster gregoryi (♀, ♂, "Thibet") are redescribed and figured.

(6693) AZUMA, A. & T. WATANABE, 1988. Flight performance of a dragonfly. *J. exp. Biol.* 137: 221-252. — (Inst. Interdiscip. Res., Fac. Engin., Univ. Tokyo, Tokyo, JA).
Anax parthenope julius was observed in free flight, and a theoretical analysis of flight performance at various speeds was carried out. The variation with time of forces and movements acting on wings and body in steady trimmed flight was calculated by the local circulation method. Measures of flight performance, such as top speed, cruising speed and maximum endurance speed, were estimated from a necessary power curve required in steady flight and from the estimated available power. The results show that without using any novel unsteady aerodynamic force generated by a separated flow over the wings, the dragonfly can make steady trimmed flight at various flight speeds, from hovering to top speed.

(6694) BERNHARDT, K.-G. & K. HANDKE, 1988. Bemerkenswerte Arthropodenfunde aus dem Emsland. *Natur & Heimat, Münster* 48(4): 100-112. — (First Author: Fachbereich 5: Biol., Univ. Osnabrück, Barbarastr. 11, D-4500 Osnabrück, FRG).
Erythromma viridulum is recorded from a sandpit in the Meppen-Lingen area, Emsland, FRG.

(6695) BIEDERMANN, J., 1988. Berichterstattungen über laufende naturkundliche Untersuchungen in Liechtenstein. Libellen. *Ber. bot.-zool. Ges. Liechtenstein-Sargans-Werdenberg* 17: 243-244. — (Blachastr. 78, FL-9494 Planken).
With reference to the report listed in *OA* 6224, a brief summary is given of a talk on current odon. work in Liechtenstein (Jan. 13, 1987). The importance of the Nature Reserves "Schwabbrünnen-Ascher" (cf. *OA* 6214, 6361) and "Rüggeller Riet" is emphasised.

(6696) BISTRÖM, O. & R. VÄISÄNEN, 1988. Ancient-forest invertebrates of the Pyhän-Häkki national park in central Finland. *Acta zool. fenn.* 185: 1-69. — (Dept Ent., Zool. Mus., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki).
3 spp. are listed, of which Leucorrhinia dubia was not recorded from this locality in the paper listed in *OA* 3992.

(6697) BRÄUNIG, P., 1988. Neurosecretory cells of the locust suboesophageal ganglion. *In:* Salánki, J. & K.S. Rósza, [Eds], Neurobiology of invertebrates: transmitters, modulators and receptors, pp. 161-171. Akadémiai Kiadó, Budapest, ISBN 963-05-4958-1. — (Inst. Zool., Techn. Univ. München, Garching FRG).
With reference to the paper listed in *OA* 6676 the locust serotonin-positive network is compared with that in Blattodea, Diptera, Odon. and Hemiptera.

(6698) BRODSKY, A.K., 1988. *Mehanika poleta nasekomyh i evolyuciya ih krylovogo apparata.* — [Insects flight mechanics and the evolution of their wing apparatus]. 208 pp. Izdat. Leningrad Univ. — ISBN 5-288-00073-5. (Russ.). — Price in the USSR: Rb 2.80 net. — (Author: Dept Ent., Univ. Leningrad, Universitetskaya naberezhnaya 7/9 USSR-199164 Leningrad).
Excellent monographic treatment of the subject, with very adequate representation of the situation in the Odon. Author's evolutionary views are of particular interest. Bibliography contains 252 titles. (Cf. also *OA* 5038).

(6699) CAO, Y & Z.-M. ZHENG, 1988. A new species of genus Davidius from China (Odonata: Gomphidae). *Acta ent. sin.* 31(4): 407- 409. (Chin., with extensive Engl. s.). — (Dept Biol., Shaanxi Teachers Univ., Xi'an, P.R. China).
D. chaoi sp. n. (holotype ♂: Huoditang, Ningshan Co., 14-VII-1979, allotype ♀: Xunyangba, Ningshan Co., 25-VI-1984) is des-

cribed and figured. It is similar to D. fujiama Fraser. All type specimens are deposited in the authors' Institute.

(6700) CHEVERTON, J.M., 1988. Odonata of the Isle of Wight. *Proc. Isle of Wight nat. Hist. archaeol. Soc.* 8(2): 29-32. — (6 Westhill Drive, Shanklin, Isle of Wight, PO37 6PX, UK).
After F. Morey, [Ed.], 1909 (*A guide to the natural history of the Isle of Wight*, Newport) and K.G. Blair, 1951 (*Proc. Isle of Wight nat. Hist. archaeol. Soc.* 4: 157-162), this is the third regional review of the Odon. Compared to the resp. 16 and 22 spp. reported in the previous lists, 23 spp. are listed here. The paper is based on 10 yrs of intensive investigation and the fauna is discussed in detail.

(6701) CHINERY, M., 1988. *Insectes d'Europe occidentale.* 320 pp., ca 1500 col. figs incl., ISBN 2-7003-0636-8 paperback. Arthaud, Paris
This is the French edition of the volume listed in *OA* 6313. Prof. Dr J. Legrand is responsible for the adaptation of the odon. section, which is greatly improved, particularly so with reference to taxonomic nomenclature.

(6702) COOPER, P.D., G.G.E. SCUDDER & G.A. QUAMME, 1988. Changes in fluid and ion secretion following stimulation in isolated Malpighian tubules of the water boatman, Cenocorixa blaisdelli (Hung.) (Hemiptera, Corixidae). *J. Insect Physiol.* 34(1): 79-83. — (Second Author: Dept Zool., Univ. British Columbia, 6270 University Blvd, Vancouver, B.C., V6T 2A9, CA).
One of the aims of the present work was to compare the situation in Cenocorixa with that in Libellula quadrimaculata in order to determine whether habitat or taxonomic position have a greater influence on Malpighian tubule function. The comparison with the Libellula larvae (cf. *OA* 4210) indicates several similarities. Both insects have a relatively sodium-rich haemolymph which is regulated across a range of salinities. Both require sodium in the bathing medium for maintenance of Malpighian tubule function and the rate of secretion is controlled hormonally. However, certain differences are also present. Electrochemical gradients indicate that potassium is actively transported in the heteropteran, while it appears to be in equilibrium between the bath and tubule lumen in Libellula (cf. *OA* 5273). Despite similar habitats of the 2 insects, Malpighian tubule function appears to differ with respect to the ionic basis of transport. The present work supports the earlier suggestion that the phylogenetic position of the Odon. may explain the difference in Malpighian tubule function, Palaeoptera having more promitive mechanisms than Neoptera. Although habitat and diet probably do influence insect Malpighian tubule function, the evolutionary context places constraints upon the mechanisms involved.

(6703) ENNOS, A.R., 1988. The importance of torsion in the design of insect wings. *J. exp. Biol.* 140: 137-160. — (Dept Biol. Sci., Univ. York, Heslington, York, Y01 5DD, UK).
The basic insect wing model is described with reference to the narrow-winged Zygoptera (Pyrrhosoma nymphula), in which spars of corrugated membrane, incorporating stiffening veins branch serially from a V-section leading edge spar. The mechanical behaviour of this model is analysed, using Tipula, Calliphora and Eristalis.

(6704) FRANCIS, I.S., 1988. Dragonflies in Ceredigion 1987. *Newsl. Dyfed Invert. Group.* 9: 8. — (Dept Geogr.., Univ. Coll. Wales, Aberystwyth, Dyfed, SY23 3DB, UK).
Notable records of 4 spp. are briefly stated (Wales, UK).

(6705) GAUTHIER, A., 1988. Odonates de Thaïlande récoltés par l'expédition Thaï 87. *Trav. scient. Expéd. APS Asie S-Est* 1: 39-40. (With Engl. s.). — (Lab. Ent., Univ. Paul Sabatier, 118 rte de Narbonne, F-31062 Toulouse).
31 spp. and 3 taxa identified to the genus only are listed from Thailand, with locality names and capture dates.

(6706) GOLEMBOWSKI, U., 1988. Quellbäche des Kottenforstes als Lebensraum gefährdeter Tierarten am Beispiel von Cordulegaster

bidentatus Selys (Insecta: Odonata). *Decheniana* 141: 204-208. (With Engl. s.). — (Wamichstr. 23, D-5100 Aachen-Eilendorf, FRG).
The occurrence of C. bidentatus in the brooks of the Kottenforst nr Bonn, FRG, was studied. Its association with various invertebrate communities is stated, and the larval distribution is quantitatively analysed with reference to bottom structure and current velocity of the habitats.

(6707) *GOMPHUS.* Mededelingenblad van de Belgische libellenonderzoekers — Feuille de contact des odonatologues belges. No volume number (June, 1988) (Dutch & Fr.). — (c/o M. Van Mierlo, Otterstraat 100, B-2300 Turnhout).
This is a simple leaflet (2 pp.) of A4 size. marked as *"Mini-Gomphus"*, and should apparently stand as Vol. 4 of this periodical. The *Abstracter* was unable to get any further information from the Publisher. It is merely an announcement of 7 field trips, organised by the Belgian workers in 1988.

(6708) HARITONOV, A. Yu., 1988. Simpatricheskaya divergenciya v popyulaciyah strekoz. — [Sympatric divergence in dragonfly populations]. *In:* Problemy mikroevolyucii, pp. 42-43, Nauka, Moscow. (Russ.). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk-91).
In the Ina R. area, SE of Western Siberia, USSR, Aeshna viridis occurs in riverine habitats and nearby (distance 400 m approx.) backwaters. In 88% of the riverine individuals life history takes 2 yr, while in the stagnicolous population it is completed within a single yr. This is ascribed to adult phenological differences. The 2 populations also show minute, but statistically significant morphological differences in both the larval and the adult stage.

(6709) HOSTETTLER, R.K., 1988 [published Apr., 1989]. Libelleninventer des Kantons Thurgau (1984-1988). *Mitt. thurgau. naturf. Ges.* 49: 21-49. — (Schulstr. 7, CH-8590 Romanshorn).
This is a comprehensive "survey" of the odon. fauna (50 spp.) of canton Thurgau, NE Switzerland, based on records from 289 localities, the names of which are not stated. Information on the abundance and habitat types is given for all spp., and some additional notes on the ecology and behaviour are provided for 25 of them. The emphasis of the work is on the current, widespread deterioration of the habitats. No regional bibliography is provided. — (*Abstracter's Note:* The peculiar features of the recent Swiss regional surveys are the fantastically large numbers of localities visited, none of which is ever specifically mentioned, and the invariable failure to collect, or to state the depository of, any voucher specimens. This makes any identification check and/or future monitoring to the succession of local faunas impossible).

(6710) JACOBY, H., 1988. Das Naturschutzgebiet "Wollmatinger Ried-Untersee-Gnadensee": Bedeutung, Schutz und Betreuung. *Naturschutzforum* 1/2: 205-306. — (Dt. Bund f. Vogelschutz, Landesverb. Baden-Württemberg, Hensteigerstr. 94, D-7000 Stuttgart-1, FRG).
44 odon. spp. are listed from this Nature Reserve in Baden-Württemberg, FRG, of which 29 spp. were recorded in 1987.

(6711) *KAGAKU SARON* [= Science Salon]. Published by the Tokai Univ. Press Tokyo, No. 46 (= Vol. 12, No. 1; Feb. 20, 1988). (Jap.). (Publishers: 3-27-4 Shinjuku, Shinjuku-ku, Tokyo, 160, JA).
The entire issue is devoted to dragonflies. — *Konishi, M.:* Trips for the "masterpieces" (inside cover p. 1); — *Tsubaki, N.:* Social behaviour of dragonflies (pp. 1-2); — *Kojima, K.:* Self-admiration (pp. 2-3); — *Kano, K.:* The White Dragonfly of Minami-daitojima (pp. 4-5); — *Ishida, S.:* On the Japanese dragonfly names (pp. 5-6); — *Ishida, K.:* Seeking for the "roots" of the Japanese dragonflies (pp. 7-16); — *Sugimura, M.:* Building up the "Dragonfly Kingdom" (pp. 17-19); — *Satoh, M.:* Insect chronicle 1987 (pp. 20-21).

(6712) LAIRD, M., 1988. *The natural history of larval mosquito habitats.* XXVIII+555 pp. Academic Press, London, ISBN 0-12-434005-9. — (Available from the SIO).

The book is concerned with mosquito ecology, with the objective to contribute towards the largely neglected field of microlimnology and to better inform culicidologists about the complex aquatic life-webs. It contains a wealth of odonatol. information, though this is understandably scattered through the work and not easy to summarise. Most of the work deals with Canadian subarctic habitats and with tropical habitats in Singapore. — The treatment of the subarctic biotopes is of less odonatol. interest, containing hardly any original odonatol. information. Coenagrion resolutum is reported to breed in permanent pools nr Churchill, Manitoba (cf. H.E. McClure, 1943, *Ecol. Monogr.* 13: 1-35), the remaining information is mostly based on the paper listed in *OA* 70 and on J.E. Hobbie Ed., 1980, *Limnology of tundra ponds, Barrow, Alaska* (US/IBP Synthesis Ser. 13), Dowden, Hutchinson & Ross, Stroudsburg, Penn. — With references to odon. involvement in the transportation of unicellular algae, the peculiar paper by B. Maguire (1959, *Ecology* 40: 312) is listed. For his odon. collection in Ithaca, New York, the author used a pistol with 0.22 shot(!) and reported that 23 out of 24 spp. carried unicellular algae, presumably acquired by their bottom-feeding larval precursors. — Of principal importance, however, are the primary accounts from Singapore, from where information on the odon. fauna is scanty, and that on odon. ecology almost non-existent. In the present work some original information is presented for 6 ecologically different habitats. Larvae were collected with a Ward's aquatic apron net, and the material was identified by the late Dr M.A. LIEFTINCK. — (1) From a duckpond nr Teck Seng village are listed Acisoma panorpoides, Agriocnemis femina, Anax sp., Crocothemis servilia, Neurothemis fluctuans, Rhyothemis p. phyllis and indet. Zygopt. larvae (p. 243). In this pond the rhabdocoel turbellarian Catenula lemnae is preyed upon by Anax larvae (p. 230). Zygopteran larvae often harbour the epibiontic peritrich Vorticella microstoma, the diatom Eunotia sp., the rotifer Brachionus rubens and larvae of the acarine Arrenurus (pp. 228, 242-243), while the zooflagellate Oikomenas termo was recovered alive from a hindgut (p. 200). — (2) In a fishpond in the same area, Ischnura senegalensis was noticed ovipositing in Ceratophyllum (cf. T. Petr, 1968, *Hydrobiologia* 32: 449-485) (p. 271). At the same locality the gut gregarine Geneiorhynchus sp. aff. monnieri was found in the gut of Anax larvae (p. 262) (cf. I. Desportes, 1963, *Annls Parasit. hum. comp.* 38: 341-377). — (3) From a fully concreted pond in Kampong, Ladang, no list of odon. spp. is produced, but the eubacteria Zoogloea ramigera is reported abundant on Zygopt. and Anisopt. larvae (p. 374), while Vorticella convallaria occurs on Zygopt. larvae (p. 390). Generally, the sessile eubacteriae Sphaerotilus natans and Zoogloea ramigera are very common epibionts on odon. larvae in polysaprobic situations, usually in colonies of 100-150 μm, seldom up to 250 μm (p. 434). — (4) In a brackish swamp off the Tampines Rd nr Paya Lebar, Anax larvae were collected with the epizoic sarcodine Arcella vulgaris and with filaments of the chlorophyte Oedogonium minus (p. 194). — (5) In a marsh pool in the same area, the peritrichs Epistalis lacustris and Vorticella microstoma were recovered from floating Anax exuviae (p. 201). — (6) From a stream nr Jalan Hock Keng, Paya Lebar, Ischnura senegalensis and Brachythemis contaminata are reported, and the suctorian Endosphaera engelmanni in a Carchesium polypinum, attached to a dead Anisopt. larva, is figured (p. 161). — The book is by no means easily legible, but much of the ecological information it contains is of considerable importance to odonatologists as well.

(6713) LIBELLULA. Mitteilungsblatt der Gesellschaft deutschsprachiger Odonatologen (GdO), Vol. 7, Nos 1/2 (1988, exact publication date not stated). — (c/o Prof. Dr R. Rudolph, Biol. Didaktik, Univ. Münster, Fliednerstr. 21, D-4400 Münster, FRG).

With the present issue the journal was again editorially and typographically improved, incl. e.g. the introduction of running titles, and Engl., French or German abstracts in all papers. — Contents: *Ott, J.:* Beiträge zur Biologie und zum Status von Crocothemis erythraea (Brullé, 1832) (pp. 1-25); — *Heidemann,*

H.: Brauchen wir einen neuen Namen für Gomphus flavipes (Charpentier, 1825)? (pp. 27-40); — *Clausnitzer, H.-J.*, Zum Vorkommen des Kleinen Blaupfeils (Orthetrum coerulescens Fabricius, 1798) in einem Heidenmoor (pp. 41-48); — *Jurzitza, G.*: Spermaauffüllung des männlichen Copulationsorganes bei Sympecma fusca (Vanderlinden, 1823) [correct: "Vander Linden"], Platycnemis pennipes (Pallas, 1771) und Enallagma cyathigerum (Charpentier, 1840) (pp. 49-51): — *Müller, J.*: Ökologisch-zoogeographische Bemerkungen zum rezenten Vorkommen von Somatochlora alpestris (Selys, 1840) (pp. 53-58); — *Peters, B.*: Entwässerungsgräben als Lebensraum bedrohter Libellenarten am Beispiel eines Grabensystems im Donaumoos/Bayern (pp. 59-66); — *Hartung, M.*: Eine heteromorphe Regeneration an einer Exuvie von Lestes macrostigma (Eversmann, 1836): Korrigierte Version (pp. 67-75).

(6714) MACHADO, A.B.M., 1988. Imagens da Serra — Images of the Serra. *In:* D. Soares, [Ed.], Serra do Cipó, pp. 1-9. Editora Nova Fronteira, Rio Janeiro (XIII+119 pp. 29.5x28.5 cm, hardcover with dustjacket; pagination and ISBN not stated). (Bilingual: Port. & Engl.). — (Author & orders: Depto Zool., Inst. Cien. Biol., Univ. Fed. Minas Gerais, Caixa Postal 2486, BR-30270 Belo Horizonte, M.G.).
This is a chapter in an exceptionally beautiful picture book on the mountain range Serra do Cipó, in the State of Minas Gerais, Brazil (alt. 1000-1800 m), one of Professor Machado's favourite dragonfly collecting grounds. His text is literary rather than scientific, contains references to Odon. and an excellent phot. of a mating Argia sp. A part (38000 ha) of the Serra has been proclaimed a National Park, and this chapter is aiming at emphasizing the importance of this region for programs on children's environmental education.

(6715) McPHERON, B.A. & N.M. SCHIFF, 1988. New distribution records for three dragonfly species (Odonata: Anisoptera) in Illinois. *J. Kansas ent. Soc.* 61(4): 494-495. — (First Author: Pesticide Res. Lab., Pennsylvania St. Univ., University Park, Penn. 16802, USA).
Adults and larvae of Tachopteryx thoreyi are reported from east-central Illinois. This is the first discovery of the immature stage in Illinois. The reports of adult Cordulegaster erronea and Zoraena bilineata are state records for Illinois.

(6716) MICHIELS, N.K. & A.A. DHONDT, 1988. Effects of emergence characteristics on longevity and maturation in the dragonfly Sympetrum danae (Anisoptera: Libellulidae). *Hydrobiologia* 171: 149-158. — (Dept Biol., Univ. Antwerp. U.I.A., Universiteitsplein 1, B-2610 Wilrijk).
Size, sex-ratio and mean abdomen length of an emerging S. danae population showed significant yearly variations. It is argued that weather plays a major role. A consistent female excess at emergence existed. — Longevity estimates in the field were highly biased by emigration, especially at an early age, and seemingly more so in females than males. The larger, early emerging individuals emigrated more readily immediately after emergence and lived longer if they stayed in the area, than did the smaller, late-emerging ones. This relation was especially clear in males. — The shorter maturation in males found in the field was attributed to a sex-specific bias in the field. Maturation time was found to be inversely related with emergence data. No effects of abdomen length, weather or density could be demonstrated.

(6717) MOLA, L.M., 1988. Comportamiento meiotico de neo-XY in Aeschna bonariensis y Aeschna cornigera planaltica (Odonata). *Resum. XIX Congr. Argent. Genet., Jujuy*, p. 91. [Abstract only]. — (Salta 1629, 3'A, AR-1137 Buenos Aires).
The karyotypes of Aeshna confusa (n=14, X), A. cornigera planaltica (n=8, neo XY) and A. bonariensis (n=13, neo-XY) are described and notes are given on meiotic behaviour in the latter 2 spp.

(6718) MORGAN, I.K., 1988. Carmarthenshire dragonflies 1987. *Newsl. Dyfed Invert. Group* 9: 8. — (4 Erw Las, Llwynhendy, Llanelli, Dyfed, SA14 9SF, UK).
5 spp. are listed with detailed locality data

(Wales, UK).

(6719) NEL, A., 1988. Parazacallitinae, nouvelle sous-famille et premier Epallagidae de l'Oligocène européen (Odonata, Zygoptera). *Bull. Mus. natn. Hist. nat., Paris* (IV) 10(C) 2: 175-179. (With Engl. s.). — (8 av. Gassion, F-13600 Ciotat).
The Parazacallitinae subfam. n. is erected in the Euphaeidae to embrace Parazacallites aquisextanea gen. n., sp. n., described and figured here from the Oligocene of Aix-en-Provence, and deposited in MNHNP (IPM-RO6688). The affinities of the new subfamily are discussed, and it is argued that the centre of euphaeid dispersal may have been situated in the Cretaceous continent of Europe-North America rather than in the Indo-Malaysian region as suggested by F.C. Fraser in his 1957 Reclassification of the Order.

(6720) NOMAKUCHI, S., 1988. Reproductive behavior of females and its relation to the mating success of two male forms in Mnais pruinosa (Zygoptera: Calopterygidae). *Ecol. Res.* 3(3) 195-203. — (Dept Biol., Fac. Sci., Kyushu Univ., Fukuoka, 812, JA).
The male population, on a stream in the upper reaches of the Ino R., consisted of the territorial esaki and the non-territorial strigata types. Females sometimes arrived at the stream for mating and oviposition. The staying time of females in the stream was 1-3 h, while that of males was 5-8 h.The proportion of the males that copulated with the females did not differ between the 2 male forms. In the Calopterygidae, of which the females usually perform multiple copulation, oviposition without subsequent recopulation is considered to be advantageous for a mated male in order to avoid the risk of sperm displacement. From such a viewpoint, the time spent for oviposition was measured for females that arrived at the stream after copulation with different male forms. The ratio was 69.1: 11.5-30.9 between esakii and strigata males. Assuming that the oviposition time is proportional to the number of fertilized eggs laid, this ratio would represent the relative reproductive succes of the 2 male forms. In fact, the relative abundance of the 2 male forms was also biased in favor of esakii males (61.7: 38.3) in this population. The mechanism of coexistence of the 2 male forms is discussed in relation to their reproductive success.

(6721) PIERCE, C.L., 1988. Predator avoidance, microhabitat shift, and risk-sensitive foraging in larval dragonflies. *Oecologia* 77(1): 81-90. — (Dept Biol., McGill Univ., 1205 Ave. Dr Penfield, Montreal, Que, H3A 1B1, CA).
Anisopteran larvae are often abundant in shallow freshwater habitats and frequently co-occur with predatory fish, but there is evidence that they are underutilized as prey. This suggests that species which succesfully coexist with fish may exhibit behaviors that minimize their risk of predation. Field and laboratory experiments were conducted to determine whether: (1) dragonfly larvae actively avoid fish, (2) microhabitat use and foraging success of larvae are sensitive to predation rsik, and (3) vulnerability of larvae is correlated with microhabitat use. The presence of adult bluegills (Lepomis macrochirus) in defaunated patches of littoral substrate in a small pond was experimentally manipulated to test whether colonizing dragonfly larvae would avoid patches containing fish. The 2 dominant anisopt. spp., Tetragoneuria cynosura and Ladona deplanata (Libellulidae), both strongly avoided colonizing patches where adult bluegills were present. Laboratory experiments examined the effects of diel period and bluegills on microhabitat use and foraging success, using Tetragoneuria, Ladona and confamilial Sympetrum semicinctum, found in a nearby fishless pond. Tetragoneuria and Ladona generally occupied microhabitats offering cover, whereas Sympetrum usually occupied exposed locations. Bluegills induced increased use of cover in all three species, and use of cover also tended to be higher during the day than at night. Bluegills depressed foraging in Tetragoneuria and to a lesser extent in Ladona, but foraging in Sympetrum appeared unaffected. Other laboratory experiments indicated that Sympetrum were generally more vulnerable than Tetragoneuria or Ladona to bluegill predation, and that vulnerability was positively correlated with use of exposed microhabitats. Both fixed (generally

low use of exposed microhabitats, diel microhabitat shifts) and reactive (predator avoidance, predator-sensitive microhabitat shifts) behavioral responses appear to reduce risk of predation in dragonfly larvae. Evidence indicates that vulnerability probably varies widely among species and even among instars within species, and suggests that spatial distribution of relatively vulnerable species may be limited by their inability to avoid predation.

(6722) PRASAD, M. & R.K. VARSHNEY, 1988. The Odonata of Bihar, India. *Rec. zool. Surv. India* (Occ. Pap.) 110: 1-45, frontispiece, 1 map + 1 pl. excl. — (Zool. Surv. India, M--Block, New Alipur, Calcutta-700053, India).
This is a monograph on the Odon. of Bihar (63 spp., of which 13 spp. not previously recorded). Where appropriate, field notes are provided, and the variations from the published descriptions are described. All taxa are keyed, and the biogeographic composition of the fauna is analysed.

(6723) PRINZINGER, R. & R. ORTLIEB, 1988. Stillgewässer-Kataster des Landeskreises Ravensburg: Daten zur Avifauna und Gemorphologie von Seen, Weihern und Teichen des Landeskreises Ravensburg und unmittelbar angrenzenden Gebiete aus dem Jahre 1985/1986. *Ökol. Vögel/Ecol. Birds* 10 (Sonderheft): 96 pp., 40 col. pls excl. — (Available from: AG Stoffwechselsphysiol., Zool. Inst., Univ. Frankfurt, Siesmayerstr. 70, D-6000 Frankfurt/Main, FRG).
Locality-wise lists of the Odon. recorded at 22 ponds in the Ravensburg district, GFR, are given on pp. 77-85. The local abundance is stated for each sp., and aerial phot. of some habitats are presented.

(6724) REAVIS. M.A. & M.W. LUTTGES, 1988. Aerodynamic forces produced by a dragonfly. *Pap. Am. Inst. Aeronaut. Astronaut.* 88(0330): 1-13. — (Dept Aerospace Engin. Sci., Univ. Colorado, Boulder, Colorado 80309-0429, USA).
Aerodynamic forces produced by tethered dragonflies were collected simultaneously with flow visualization photographs during low speed wind tunnel tests. The 500 frame/sec flow visualization photographs were directly correlated to the aerodynamic forces obtained from a three degree of freedom force balance. Flow visualization was used to identify flow structures associated with a variety of wing kinematics. The various wing kinematics displayed critical upper or lower dynamic limits, needed for maximum peak lift force generation. The wing kinematics of the dragonfly produced a flow field enriched in vortex structures located both above and below the wings. The appearance of vortex structures was coincident in time with increasing lift. Altered kinematics yielded less lift and more thrust. A reciprocal relation was demonstrated between lift and thrust. The kinematics yielded highly correlated relations between flow structures and force generation. But these relations were not consistent with the Weis-Fogh mechanism. The use of unsteady separated flows by dragonflies encourages other approaches to the use of such flows.

(6725) ROHDE-ARNDT, D., 1988. *Haiku.* VIII+48 pp. Hingst, Recklinghausen, ISBN 3-927346--35-7. — Price: DM 12.-. (German)
Contains 3 dragonfly haiku, and is illustrated with "Japanese-style" brush paintings.

(6726) ROWE, R., 1988. Alternative oviposition behaviours in three New Zealand corduliid dragonflies: their adaptive significance and implications for male mating tactics. *Zool. J. Linn. Soc.* 92: 43-66. — (Dept Zool., James Cook Univ., Townsville, Quld 4811, AU).
Oviposition behaviours of female, and mate acquisition and defence behaviours of male, "Procordulia" grayi, Procordulia smithii and Hemicordulia australiae (3 phylogenetically close corduliid spp.) are contrasted. 12 distinct methods of oviposition occur involving different motor patterns. These different oviposition behaviours place ova into different microhabitats. Each sp. has a distinct repertoire of oviposition methods, with only 1 of the 12 methods occurring in more than 1 sp. The oviposition behaviours differ in their susceptibility to male interference. The implications for male sperm displacement tactics and for

the development of conditional male strategies are discussed. Male mating behavior varies with the geometry of the breeding site, in a manner consistent with an ideal free distribution model where females vary in their "value" through differential susceptibility to takeover by other males. It is shown that differential susceptibility of females to takeover would stabilize the observed mixed mating strategy among male "P." grayi and P. smithii.

(6727) SCHMIDT, E., 1988. Zum Status der Grossen Moosjungfer Leucorrhinia pectoralis im Landesteil Schleswig. *Faun.-ökol. Mitt.* 6(1/2): 37-42. (With Engl. s.). — (Biol. Didaktik, Pädag. Fak., Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG).
8 new records are added to the 2 previously known from Schleswig, FRG. The sp. is a sporadic migrant with a temporary reproduction in mesotrophic (and scarce woodland) bogs of the region. Its recent migration activity is also evidenced by fresh records from the island of Helgoland, 50 km off the Northsea coast.

(6728) SUHACHIOVA, G.A., A.Yu. HARITONOV & T.Yu. PEREVOZCHIKOVA, 1988. Kolichestvennaya ocenka pitaniya strekoz. — The quantitative estimation of food consumption of dragonflies. *Izv. sib. Otd. Akad. Nauk SSSR* (Biol.) 20(3): 3-7. (Russ., with Engl. s.). — (Second Author: Inst. Biol., Siber. Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).
Coefficients of insect food intake by dragonflies are calculated and appear predator rather than prey specific. It is shown that odon. contribute essentially to the transformation of organic matter in the vicinity of their aquatic habitats.

(6729) *SYMPETRUM*. Revue d'Odonatologie. No. 2 (1988). [This is the second issue published, cf. *OA* 6351, therefore it should apparently count as Vol. 1, No. 2", but this is not stated]. — (Orders to: G.R.P.L.S., 97 rue St. Laurent, F-38000 Grenoble).
Blanc, J.M.: Editorial (pp. 3-4); — *Zannoni, C.*: Ma première Leucorrhinia (pp. 5-7); — *Auzière, C. & P. Juliand*: Observations odonatologiques en Belledonne (pp. 9-31); — *Deliry, C.*: Première liste commentée des libellules du marais de Lavour (Ain) (pp. 33-50); — *Grand, D.*: Confirmation de la présence d'Epitheca bimaculata en Isère (pp. 51-53); — *Juliand, P.*: Le Calopteryx nouveau est arrivé! (pp. 55-58); — *Loose, D.*: Observations sur Hemianax ephippiger en Camargue (pp. 59-61).

(6730) UTZERI, C., 1988. Effetti della marcatura sulla longevità di odonati. *Riassunti 52 Congr. naz. Unione zool. ital., Camerino*, p. 21. — (Dipt. Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
Statistical examination of the longevity of wing-marked individuals as used in behaviour and population studies has revealed that in Crocothemis erythraea longevity is reduced in individuals marked by 2 marks, and in females marked either by 1 or by 2 spots of which at least 1 in a proximal position. In Lestes barbarus marking itself does not influence longevity. The colour of the markings generally has no effect on longevity in either sp., save for red, which invariably shortens it. It is speculated that 2 marks make the dragonfly better visible to predators, particularly so if red is used.

(6731) UTZERI, C., 1988. [Recensione]. I. Pecile, Libellule. *Boll. Ass. romana Ent.* 42: 83. (Ital.). — (Dept. Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
Book review of the volume listed in *OA* 4870.

(6732) UTZERI, C., 1988. Odonati dell'isola Montecristo (Arcipelago Toscano). *Boll. Ass. romana Ent.* 42: 1-8. (With Engl. s.). — (Dipt. Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
1 zygopt. and 8 anisopt. spp. are recorded, of which 5 breed in the island at least in some years. Due to ecological circumstances, the odon. fauna of this Italian island is considered

"unsettled". (Cf. also *OA* 3915).

(6733) WESTERMANN, K. & G. SCHARFF, 1988. Auen-Renaturierung und Hochwasserrückhaltung am südlichen Oberrhein. *Naturschutzform* 1/2: 95-158. — (Dt. Bund f. Vogelschutz, Landesverb. Baden-Württemberg, Hensteigstr. 94, D-7000 Stuttgart-1, FRG).
15 odon. spp. are listed, and the status of some of these in the southern Upper Rhine, Baden Württemberg, FRG, is discussed.

(6734) YOUNG, O.P. & T.C. LOCKLEY, 1988. Dragonfly predation upon Phidippus audax (Araneae, Salticidae). *J. Arachnol.* 16(1): 121--122. — (Paul's Cove, Greenville, Miss, 38701, USA).
The behaviour of a salticid spider in the presence of patrolling Epiaeschna heros is documented, and some earlier records of odon. predation upon Salticidae are reviewed.

1989

(6735) (Anonymous), 1989. Tuhat vuotta kultaseppien matkassa: Tsaarinajan jalot taidot. — [Thousand years with goldsmiths: the noble art of the tsaristic period]. *Satakunnan Kansa, Pori* 116(82): 1, 8. (Issue of March 24). (Finnish).
A newspaper article on the occasion of the exhibit in Finland of a part of the Russian Imperial treasure, deposited now in the State Museum of History, Moscow. On p. 8, there is a col. phot. of a dragonfly pin in Art Nouveau style, made by V. Agafonov of Moscow (gold, rubies, brilliants, diamonds, pearls; 6.2x7 cm; 1908-1917). These items were for the first time now exhibited outside the USSR.

(6736) ALCOCK, J., 1989. The mating system of Brechmorhoga pertinax (Hagen): the evolution of brief patrolling bouts in a "territorial" dragonfly (Odonata: Libellulidae). *J. Insect Behav.* 2(1): 49-62. — (Dept Zool., Arizona St. Univ., Tempe, Arizona 85287, USA).
Males patrolled and competed for narrow strips of stream edge, 2-8 m long, containing a few barely submerged patches of sandy or fine gravel substrate. These scarce patches were used as oviposition sites by females that usually, but not always, mated with a patrolling male just prior to egg-laying. Females visited the oviposition sites evenly throughout the day from 0830 to 1430 but male activity rose until midday and then declined sharply after 1330. Some gravid females refused to mate in the midafternoon despite male efforts to copulate with them. The average patrolling bout by a male lasted less than 15 min, with defenders usually leaving immediately after 1 or 2 aggressive interactions with intruders or leaving voluntarily without apparent cause. Many individuals returned for additional bouts of patrolling at the same site, but the total daily period of patrolling for any one individual almost never exceeded 1 h.

(6737) ALEKSEEV, D.S., 1989. Strekozy goroda Sverdlovska. — [Dragonflies of the Sverdlovsk city]. *In:* I.V. Nikolaeva, [Ed.], Nasekomye v biogeocenozah Urala, pp. 3-4. Ural Sect. USSR Acad Sci., Sverdlovsk. (Russ.). — (Author's address not stated).
List of 23 spp. For other papers on the odon. fauna of the Ural region, European USSR, cf. *OA* 1257, 6300).

(6738) ASAHINA, S., 1989. An additional note to my Aeschna mixta revision. *Gekkan Mushi* 217: 22-23. (Jap., with Engl. s.). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
With reference to the paper listed in *OA* 6461, 2 male specimens are described and figured from "Mandalay(?)" (Burma) and from "Jinquan" (Gansu, N. China). The Burmese specimen "seems quite close" to the Kashmir material, and the Gansu individual is "rather allied" to the Manchurian ssp.

(6739) ASAHINA, S., 1989. Notes on the early history of Japanese odonatology (1901-1950). *Gekkan Mushi* 218: 10-17. (Jap., with Engl. title). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).
The paper is divided into periods 1853-1900, 1901-1926, 1927-1940, and 1941-1950. It also contains several portraits, incl. those of Matokishi Namie (1854-1918), Shonen Matsumura (1872-1960) and Kan Oguma (1885-

-1971).

(6740) BOEV, V.G., M.G. BAYANOV & I.L. KARATAEVA, 1989. Materialy k kadastru fauny strekoz Bashkirskoy ASSR. — [Material towards the dragonfly distribution retrieval of the Bashkir ASSR]. *Tez. Dokl. vsesoyuz. Soveshch. Probl. Kadastra i Ucheta zhivot. Mira* 1: 100-101. (Russ.). — (Author's mailing address not stated).
The odon. fauna of the Bashkir ASSR, USSR, is insufficiently evidenced, most of the available information is based on hydrobiological and faunistic surveys. So far 46 spp. were recorded, 26 of which are widely spread. For 8 spp. some phenological data are presented and it is emphasised that additional evidence is particularly needed on Anax imperator and Macromia sibirica. — (*Abstracter's Note:* The Bashkir Autonomous Republic is a part of the European USSR, in the southern Ural Mts. It is most peculiar that its highly interesting fauna is not considered in any of the works on the European Odon. Obviously, M. sibirica should be added to the European fauna).

(6741) BOUZIDI, A., 1989. *Recherches hydrobiologiques sur les cours d'eau des massifs du Haut-Atlas (Maroc): Bio-écologie des macroinvertébrés et distribution spatiale des peuplements.* X+179 pp. These Docteur ès-Sciences, Fac. Sci. & Techn. Saint Jérome, Univ. d'Aix-Marseille III. — (Author's current address unknown).
Contains information on 5 odon. spp.

(6742) *BULLETIN OF HOKKAIDO ODONATOLOGICAL SOCIETY,* Vol. 3 (Jan. 31, 1989) — (c/o Dr H. Ubukata, Dept Sci. Educ., Kushiro Coll., Hokkaido Univ. Educ., Shiroyama 1-15, Kushiro, 085, JA).
Koyama, T.: Preface (p. 2); — *Asahina, S.:* Dragonfly collection in 1935 preserved in the Entomological Institute, Hokkaido University (pp. 3-9); — *Takahashi, T.:* Boyeria maclachlani (Selys) from Sapporo City (pp. 10-13); — *Koyama, T.:* Is Somatochlora japonica (Matsumura) a good species or a subspecies of S. metallica (Van der Linden)? (pp. 14-15); — *Ubukata, H.:* A course for the beginners of dragonfly study, 3 (pp. 16-18); — [*Hiratsuka, K.*]: The distribution table of the Odonata of Hokkaido, 5 (pp. 19-21); — The distribution table of the Odonata of islands near Hokkaido-, 5 (pp. 22-24); — *Ubukata, H.:* A report of insect watching meeting in Kushiro Moor (p. 25); — *Okamoto, S.:* A report from excursion for dragonfly watching in Niseko area (p. 26); — [*Hiratsuka, K.*]: Book review [of the volume listed in *OA* 6384] (p. 27); — *Koyama, T.:* Notice of the Third Annual Meeting of H.O.S. (p. 28); — [*Hiratsuka, K.*]: New records of dragonflies (p. 30); — Notice of "Insect Lovers' Salon" (p. 30); — List of the new members of H.O.S. (p. 29); A letter from Editor (p. 31); — *Letters* from members of H.O.S. (pp. 13, 15, 25); — *Miscellanies* (pp. 28, 29, 31); — Cover photograph by *A. Fukumoto,* shows a female of Somatochlora japonica.

(6743) CONVEY, P., 1989. Post-copulatory strategies in the non-territorial dragonfly Sympetrum sanguineum (Müller) (Odonata: Libellulidae). *Anim. Behav.* 37(1): 56-63. — (Dept Zool., Univ. Cambridge, Downing St., Cambridge, CB2 3EJ, UK).
Reproductive behaviour, particularly mate-guarding strategies, was studied at Quy Poors Fen, Cambridgeshire, during 1984 and 1985. Two mate-guarding strategies used by males were identified. All pairs started oviposition while in the tandem or contact-guarded formation; some pairs remained in tandem for the whole oviposition bout (termed "tandem only" pairs), while the remainder separated before completion of the bout and the male continued to guard by a non-contact strategy ("non-contact" pairs). The switch in male guarding behaviour was related to the amount of interference from other males experienced during the early stages of tandem oviposition. Pairs employing the non-contact strategy had longer oviposition bouts than pairs using the tandem only strategy, but did not differ in the total number of egg-laying dips. Female dip rate was higher during the tandem than the non-contact phase of an oviposition bout. Females flick their abdomen while flying to aid egg release, and faster dip rates result in an increase

in egg release rate. It is suggested that ovipositing females and tandem pairs are much more vulnerable to predation by larger odonates than lone males are, and therefore that male S. sanguineum adaptively switch between guarding strategies to balance the risk of losing their female to a rival male with the energetic and survival costs associated with tandem flight.

(6744) DUDGEON, D., 1989. Gomphid (Odonata: Anisoptera) life cycles and production in a Hong Kong forest stream. *Arch. Hydrobiol.* 114(4): 531-536. — (Dept Zool., Hui Oi Chow Sci. Bldg, Univ. Hong Kong, Hong Kong).
Heliogomphus scorpio and Onychogomphus sinicus from Tai Po Kau Forest Stream, Hong Kong, have poorly-synchronized, univoltine life cycles, with emergence in late April-May prior to the summer monsoon. Production, estimated by the size-frequency method, was 236.2 mg dry wt $m^{-2}yr^{-1}$ for O. sinicus and 182.1 for H. scorpio; P: B ratios were 3.6-3.7. Total production of Odon. in the stream was calculated to be 1019.4 mg dry wt $m^{-2}yr^{-1}$.

(6745) DUDGEON, D., 1989. Life-cycle, production, microdistribution and diet of the damselfly Euphaea decorata (Odonata: Euphaeidae)in a Hong Kong forest stream. *J. Zool., Lond.* 217: 57-72. — (Dept Zool., Hui Oi Chow Sci. Bldg, Univ. Hong Kong, Hong Kong).
The sp. in Tai Po Kau forest stream, Hong Kong, is univoltine. Most recruitment took place in summer, and larval growth proceeded throughout the year. Life-cycles recorded in 1977-78 and 1978-79 were similar. Annual production estimates, using the removal-summation instantaneous growth and size-frequency methods, were more similar for the 1978-79 generation (ranging from 158.7-174.7; mean 167.1 mg dry wt m^{-2}) than for the 1977-78 generation (93.9-173.6; mean 131.7 mg dry wt m^{-2}). Mean biomass was similar for both generations (ranging from 33.5-33.9 mg dry wt m^{-2}), and mean P/B ratios were 3.9 (1977-78) and 5.0 (1978-79). These are the first estimates of annual production by an Oriental stream insect. — Larvae were most abundant at microsites in the middle of the stream. Multiple regression analysis indicated that substratum characteristics were a major determinant of microdistribution. Euphaea decorata apparently favoured poorly-sorted sediments with highly peaked grain size-frequency distributions, containing few fine particles. — The carnivorous larvae showed ontogenetic changes in diet, small individuals consumed mainly chironomid larvae; the diet expanded to include (successively) larvae of Ephemeroptera and Trichoptera as E. decorata grew. Seasonal changes in diet were also apparent, although larval diets during spring and summer were similar. There was also considerable overlap between autumn and winter diets. Ontogenetic influences upon prey consumed were not sufficient to account for the observed seasonal differences.

(6746) DUNKLE, S.W., 1989. *Dragonflies of the Florida Peninsula, Bermuda and Bahamas.* X+158 pp., 129 col. figs incl. (soft cover, 15x23 cm). ISBN 0-945417-23-3. Scientific Publishers, Gainesville, FL. — Price in the US: US 13.- net. — Available from the S.I.O. — (Author: Bureau Ent., D.P.I., P.B. Box 1269, Gainesville, FL 32602-1269, USA).
This attractive and highly useful work is the first specialized and throughly illustrated dragonfly field guide available commercially for a New World region. Its photographic documentation can be compared with the brief odon. section in the Audubon Soc. volume listed in *OA* 3128, while the textual treatment somewhat resembles that of the excellent British Columbia "handbook" (*OA* 2055), testifying to the author's supreme knowledge of the subject and to his notable writers' skill. — In the US, the appelation "dragonfly" usually strictly refers to the Anisoptera only, hence the present work is restricted to this suborder. All of the regional 94 spp. are described and illustrated, this covergae representing the majority of the taxa occurring on the southeastern Coastal Plain and about a third of the North American anisopt. fauna. The book will allow the safe identification of most of the regional taxa, though additional technical literature will be needed in the case of some female specimens and for separating

some "closely allied" taxa (e.g. Libellula auripennis/L. needhami). It is directed in the first place at amateur entomologists, and covers the adult stages only, but much of the information presented will be indispensable to professional workers as well. — The introductory text includes brief chapters on the general distribution in Florida, external morphology (here called "anatomy"), immature stages and life history, on photography, collecting and conservation, and a special section on the uses of "Dragonflies in education". — On the concluding pages separate checklists are given of the fauna of Florida, the Bermuda Islands and the Bahamas, and a (relatively short) selected bibliography is added. — The treatment of spp. is conveniently standardised, concise and highly informative. The artificial English name, is given along with the taxonomic name (full taxonomic names appearing in the checklists), and the text is divided into sections "Identification", "Ecology"(containing also information on the geographical range) and "Behavior". All spp. are illustrated with good col. phot. (usually larger than natural size, but the measurements are stated in the text); in the cases of sexual dimorphism both sexes are shown. Technical reproduction of a few phot. is not optimal, but this clearly is the responsibility of the publisher rather than the author's. — The use of "common" (vernacular) names nowadays appears a matter of personal conviction and it is generally advocated by the argumentation that these will be more readily handled by non-professionals than the proper taxonomic nomenclature. This may be true in the vertebrates, but it appears to the *Abstracter* pointless in the groups where sophisticated technical literature is needed to separate the taxa on the basis of often minute structural features. Apart from this, the application of "common" names does not facilitate the legibility of the text to a professional (or, actually, to any) worker. Moreover since these names are not standardised, their application inevitably causes a confusion in recent literature which taxonomists have not seen since Linnaean times. This applies to "common", i.e. artificially created names in all languages, and it is particularly apparent also in English. Not only are the British and the American vernacular nomenclature not standardised (e.g. in Britain Libellula spp. are "chasers" and Sympetrum spp. are "darters", while in the present book they are called resp. "skimmers" and "meadowflies"), but even the North American appellations are not uniform. For example, Tramea spp. are "saddlebags" in the Audubon work (*OA* 3128) and "gliders" here. Perithemis tenera is called here "Eastern Amberwing", while it is the "Low-flying Amberwing" in the Audubon volume, and the "Common Amberwing" in H. Simon's book listed in *OA* 1752, etc. All information on taxonomic affinities is lost where the same generic vernacular name is used for 2 or more genera, or 2 such names appear for different species of the same genus. — It is often much easier to prepare a text for professional workers than one directed at the more general readership. The Author did an excellent job!

(6747) EDA, S., 1989. Chronicle of Japanese odonatology in 1988, with supplemental notes of 1987. *Nature & Insects* 24(3): 16-25. (Jap., with Engl. title). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
[Abstract not available]. This is a continuation of a series (cf. *OA* 6274) and contains numerous references to papers published in local Japanese periodicals, many of which are unavailable for abstracting.

(6748) FRANCIS, I.S., 1989. Dragonfly recording in Ceredigion since 1984. *Newsl. Dyfed Invert. Group.* 12: 9-11. — (Dept. Geogr., Univ. Coll. Wales, Aberystwyth, Dyfed, SY23, 3DB, UK).
The Ceredigion records, gathered after the publication of the work listed in *OA* 5383, are listed and discussed in considerable detail.

(6749) GOFFART, P., 1989. Coenagrion lunulatum (Charpentier, 1840), un odonate en expansion en Belgique? *Notes faunist. Gembloux* 18: 3-9. — (Unité Ecol. & Biogéogr.., Univ. Cathol. Louvain, Place Croix du Sud 4-5, B-1348 Louvain-la-Neuve).
The Belgian records of C. lunulatum are traced since 1843, mapped and discussed from the point of view of the possible recent expansion

of this sp.

(6750) *GOMPHUS.* Mededelingenblad van de belgische libellenonderzoekers — Feuille de contact des odonatologues belges, Vol. 5, No. 1 (Feb., 1989). (Dutch & Fr.). — (c/o M. Van Mierlo, Otterstraat 100, B-2300 Turnhout).
The Editorial *(P. Goffart)* is followed by a report on the progress on the mapping scheme (1987-1988), made after the publication of the Atlas (cf. *OA* 5434) *(A. Anselin).* Reports on 2 field trips *(P. Goffart, I. Horst),* and very detailed reviews of 7 publications related to the Belgian fauna *(A. Anselin, P. Goffart, M. Van Mierlo)* conclude this informative and useful issue.

(6751) *GRACILE.* [Newsletter of Odonatology]. Published by the Kansai Research Group of Odonatology, Osaka, No. 40: "A Memorial Number of the late Dr S. Obana" (Feb. 1, 1989). (Jap., with Engl. titles). — (c/o K. Tani, 129 Jizo-cho, Nara, 630, JA; outside Japan also c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
This tribute issue to the memory of the late Dr Shigeru Obana (born June 28, 1914, deceased July 12, 1988; for a biography and bibliography cf. also *Odonatologica* 14, 1985: 81--88) is by far the largest issue of this journal so far published. The formal obituary is provided by *K. Inoue* (pp. 1-11, with portrait and bibliography) and is followed by personal reminiscences and "in memoriam" notes (pp. 12-36) by *S. Asahina, S. Tsuda, T. Kimura, N. Anaze, Y. Miyatake, K. Tani, T. Miyazaki, H. Kuwahara, A. Muraki, T. Yamamoto, O. Tabata, K. Miyakawa, Y. Yamashita, I. Matsuda, M. Tokumasu, T. Seki, K. Matsuki, N. Katatani,* and *O. Tominaga.* — The remaining part of the issue is made up by the following technical papers; *Tsuda, S. & K. Kitagawa:* Odonata of Southeast Asia collected by the late Mr M. Iwasaki, Part. 3: Odonata of North Borneo (Sabah, Malaysia) (pp. 37-39); — *Arai, Y.:* Rice field and dragonflies. 2 (pp. 40-43); — *Matsuki, K. & J.-C-Lien:* Additional notes on the libellulid dragonflies of Taiwan (pp. 44-67); — *Azuma, T.:* Report of survey trips for Mnais species along Chikusa River, Hyogo Prefecture (pp. 68-74); — *Watanabe, Y. & S. Kondoh:* On the flora substrates oviposited by Epiophlebia superstes observed at Kibune River (pp. 75-76); — *Nagase, K.:* Odonate fauna of Amagasaki City (pp. 77-80); — *Takamatsu, T.:* Ceriagrion nipponicum recorded from Wakayama Prefecture for the first time (pp. 80-81); — *Nagase, K.:* Report of the field survey on the odonate fauna of Yodo River, 2 (pp. 82); — *Miyatake, Y.:* Report of the field survey on the odonate fauna of Yodo River, 3: On Mortonagrion and Stylurus species (pp. 83-86); — *Nagase, K.:* Report of the field survey on the odonate fauna of Yodo River 4: On Sympetrum species (p. 86); — *Nishu, S.:* Report of the survey trip on the odonate fauna of Awaji Island, Hyogo Prefecture (4) in spring, 1988 (pp. 87-89); — *Inoue, K.:* Report of the survey trip on the odonate fauna of Awaji Island, Hyogo Prefecture (5) in midsummer, 1988 (pp. 90-95; — *Shimura, S.:* Report of the additional survey to the 5th trip on the odonate fauna of Awaji Island, Hyogo Prefecture (p. 96); — *Inoue, K.:* Report of the survey trip on the odonate fauna of Awaji Island, Hyogo Prefecture (6) in late autumn, 1988 (pp. 97-101); — Report of the survey trip for Mnais damselflies in Hyogo and Okayama Prefectures (pp. 102-105); — *Nagase, K.:* Report of the survey trip for Mnais pruinosa nawai in Kagawa Prefecture (pp. 106-107); — *Maruyama, K.:* Anax guttatus caught at Jinja--Ike Pond, Tomogashima Island, Wakayama Prefecture (p. 108); — *Muraki, A.:* In search of Macromia urania and Macromidia ishidai in Ishigaki Island, Okinawa Prefecture, Part 2 (pp. 109-114); — *Matsuda, I.:* Memories of "Tombo-tsuri" (catching dragonflies) (115--124); — *Yamashita, Y.:* A homage to Anax parthenope julius (pp. 124-125).

(6752) *GRACILE.* [Newsletter of Odonatology]. Published by the Kansai Research Group of Odonatology, Osaka, No. 41 (Apr. 1, 1989). (Jap., with Engl. titles). — (c/o K. Tani, 129 Jizo--cho, Nara, 630, JA; — outside Japan also c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno--ku, Osaka, 545, JA).
Matsuki, K. & J.C. Lien: Additional notes on the coenagrionid dragonflies of Taiwan (pp.

1-11); — *Tsuda, S.*: To use the mesh-code (pp. 12-16); — *Arai, Y.*: Collecting and breeding record of Anax guttatus larvae (pp. 17-18).

(6753) HARITONOV, A.Yu., 1989. Redkie i ohranyaemye strekozy Urala. — [Rare dragonfly species of the Ural region that are in the need of conservation]. *In:* I.V. Nikolaeva, [Ed.], Nasekomye v biogeocenozah Urala, pp. 71-72. Ural Sect., USSR Acad. Sci., Sverdlovsk. (Russ.). — (Inst. Biol., Siberian Sect., USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).
Ischnura aralensis (known from 2 localities in the Syr-Darya = Jaxartes R. basin, listed in the USSR Red Data Book, cf. *OA* 5090), Aeshna undulata (described from the Ilimensk Lake and probably endemic to the Ural region) and Somatochlora sahlbergi (subarctic region of the Ural Mts) are listed and briefly discussed. It is emphasized that all rare Ural spp. should be systematically studied as to their current distribution and ecology, and adequate management and protective measures should be designed for each of them. The Ilimensk Nature Reserve is of particular importance for dragonfly conservation in this area.

(6754) HARITONOV, A.Yu., 1989. Territorialnoe raspredelenie strekoz fauny SSSR. — [Geographical dragonfly distribution in the USSR]. *Tez. Dokl. vsesoyuz. Soveshch. Probl. Kadastra i Ucheta zhivot. Mira* 4: 154-155. (Russ.). — (Inst. Biol., Siberian Sect. USSR Acad. Sci., Ul. Frunze 11, USSR-630091 Novosibirsk).
Dragonfly distribution is mainly governed by climatological conditions and by the availability of adequate aquatic habitats. The northern range of the rheophilous spp. is defined by the July isotherm of + 16° C. Those rheophilous in the S, but stagnicolous in the N, range much further northwards. 12 out of the 170 USSR spp. breed in thermal waters; their isolated populations occur hundreds of km N of the main sp. range and (2 spp. in the Pamir) up to 4000 m alt. In some spp. the Pleistocene glaciations caused their recent disjunct ranges (Coenagrion hylas, Sympetrum croceolum). The long-range migratory flights in some spp., and the specialised ecological adaptations in the others are also reflected in their distribution patterns.

(6755) Hsr., 1989. Den Libellen auf der Spur. *Neue Züricher Ztg* 1989 (21): 53; issue of Jan. 26.
This well-informed, but anonymous article, published in the renowned Swiss daily, has appeared on the occasion of the publication of C. Meier's monograph (*OA* 6538). It gives a brief summary of the latter, but its main objective apparently are a few highly "political" statements on the situation of, and the trends in Swiss homestead odonatology. At present, the programme of Swiss odonatologists has largely departed from the world-wide research concepts established and practised with the greatest succcess by F. Ris during the earlier decades of this century; the current endeavours being almost exclusively centred on various aspects of the local fauna, mostly so with direct or indirect reference to the pending conservation problems. In this area, a great deal has been achieved and new methods were developed. It is reassuring to read, therefore, that the local political authorities tend to morally and financially support this work. With reference to the situation in the canton of Zürich, however, it is emphasised that the University is apparently not interested ("offenbar nicht willens") in supporting this kind of studies. Consequently, much of the ecologically defined conservation research on the Odon. largely depends on private initiative. The Swiss "Code of Ethics" relative to the collecting of voucher specimens is draconic. Meier (*OA* 6538, p. 23) stated that "it is wrong to collect many specimens of certain genera (e.g. Lestes) and of the rare spp. solely because one did not learn to identify them in the field". It is not clear whether the common L. sponsa and L. viridis are also to be understood here, but the statement in the present article is more explicit: "Nowadays it is, so to say, a matter of the Code of Ethics that the specimens are identified in the field and released". Needless to say, this policy is in affront with the 1981 SIO and IUCN Species Survival Commission official recommendations. It is not a matter of "learning to identify

in the field" (if this is at all technically possible), but rather a measure of security and of the possibility of checking whenever and for whichever reason the need for this would arise in the future. This is in accordance with the plesiotype concept, practised so far universally.

(6756) HUTCHINSON, R., 1989. Note sur la répartition géographique de Gomphus spiniceps Walsh (Odonata: Gomphidae) au Québec. *Fabreries* 14(1): 16-18. (With Engl. s.). — (Centre Rech. biosyst., Agriculture Canada, Ottawa, Ont., K1A, OC6, CA).
Notes on the Quebec distribution of G. spiniceps are given and a recent discovery of a breeding population at Plaisance is recorded.

(6757) *JOURNAL OF THE BRITISH DRAGONFLY SOCIETY*, Vol. 5, No. 1 (Apr. 1989). — (c/o Mrs R.I. Silsby, 1 Haydn Ave., Purley, Surrey, CR2, 4AG, UK).
Jones, S.P.: An unusual specimen of Pyrrhosoma nymphula (p. 1); — *Winsland, D.C.:* The jizz: some thoughts on dragonfly recognition (pp. 2-6; — 21 spp., vernacular names only); — *Prendergast, E.:* Pond construction for dragonflies (pp. 6-7); — *Goodyear, K.G.:* The dragonflies (Odonata) of Sowley Pond, New Forest, Hampshire (8-14); — *Recent odonatological publications* (pp. 14-16; — 54 titles).

(6758) KATSUYA, I., 1989. More insect eating. *Nature, Lond.* 337: 513-514. — (Inst. Low Temperature Sci., Hokkaido Univ., Sapporo, 060, JA).
[The following is the verbatim text of a "Letter to the Editor"]: "As a child in the Nanshin district of the southern Nagano prefecture in Japan, I consumed various insect spp. Many people living there still eat Ephemeroptera (I cannot make further identification), Odon. (Libellulidae), Orthoptera (Tettigonioidea and Acridioidea), Plecoptera, Hemiptera (Cidadidae), Neuroptera, Trichoptera, Lepidoptera, (pupae and adults of silk worm), Coleoptera (adults of true water beetles and water-scavenger beetles, plus larvae, pupae and adults of longicorn beetles) and Hymenoptera (all species of Vespa and Polistes inhabiting the district). In Nanshin supermarkets one can buy aquatic insects (canned), Vespa spp. (canned), rice hoppers and cooked pupae and adult silk worm. Most insects are cooked before eating but some people eat raw larvae or pupae of wasps. — S.S. Kantha (1988, *Nature, Lond.* 336: 316-317) suggested insectivory could both provide a source of animal protein and remove agricultural pests. But another possibility is that insects are a source of salt and minerals. Nanshin is surrounded by mountains 2000--3000 m high, and has heavy annual rainfall. These conditions must have made it difficult to bring in salt from coastal districts when traffic networks were still poorly developed. — A teacher at a high school in Nanshin tells me that until about 100 years ago, when the production of salt was reduced in coastal districts due to humid weather conditions, the people of Nanshin frequently either ate more insects to increase their salt intake or extracted salt by boiling tatami".

(6759) KEMP, R.G., 1989. Notes on some Shropshire dragonflies. *Shropshire Wildlife* 74: 6. — (33 Bridge Rd, Alveley, Bridgnorth Shropshire, WV15 6JN, UK).
With reference to the work listed in *OA* 3853, Gomphus vulgatissimus and Leucorrhinia dubia are highlighted, and Aeshna mixta and Sympetrum sanguineum are added to the Shropshire (UK) list.

(6760) KLISS, M., C. SOMPS & M.W. LUTTGES, 1989. Stable vortex structures: a flat plate model of dragonfly hovering. *J. theor. Biol.* 136: 209-228. — (Dept Aerospace Engin. Sci., Univ. Colorado, Boulder, Colorado 80309--0429, USA).
To understand the unsteady separated flow mechanisms associated with the hovering flight of certain insects, flat plates of varying thickness were sinusoidally driven back and forth using a broad range of motion amplitude and rate conditions in the absence of mean flow. Flow visualization and hotwire anemometry techniques were used to characterize the resulting vortical structures and velocity profiles. The initiation, development, and perseverance of vortical structures were quantita-

tively and qualitatively assessed. Only a narrow range of oscillation parameters elicited the cohesive types of flow structures that appear to be utilized by dragonflies. These structures were selectively sensitive to variations in specific parameters. For thin plates, vortical structures were influenced most by changes in oscillation amplitude, not oscillation frequency. The reverse was observed for thick plates. Vorticity accumulation, and the initiation, development and shedding of vortex structures from an oscillating flat plate are accounted for using a simplified physical model.

(6761) KOIZUMI, T., 1989. Report about dragonflies and butterflies from Takahoko marsh in Rokkashyo village. *Nature & Insects* 24(2): 17-21. (Jap., with Engl. title). — 2-2 Waki, Hamasaka, Toyosaki-chô, Hachinohe-shi Awomori, 039-11 Japan.
Abstract not available, but Sympetrum uniforme, S. croceolum, S. striolatum and Nannophya pygmaea are discussed.

(6762) LEGRAND, J., 1989. Note synonymique sur trois odonates afrotropicaux. *Revue fr. Ent.* (N.S.) 11(1): 36. (With Engl. s.). — (Lab. Ent., Mus. Natn. Hist. Nat., 45 rue de Buffon, F-75005 Paris).
Chlorocypha muniensis Compte Sart, 1967 = C. gracilis Karsch, 1899; — Gynacantha lieftincki Compte Sart, 1964 = G. africana (Palisot de Beauvois, 1805); Macromia martorelli Compte Sart, 1964 = M. funicularia Martin, 1906.

(6763) LOTZING, K., 1989. Beiträge zur Faunakartierung des Kreises Stassfurt. Teil 3: Die Kleinlibellen (Familien: Prachtlibellen, Teichjungfern, Federlibellen). *Abh. Ber. Naturk. Vorgesch., Magdeburg* 14: 17-24. — (C.-Zetkin-Str. 4, DDR-3251 Unseburg, GDR).
Continuation of the paper listed in *OA* 6561, dealing with Calopterygidae, Lestidae and Platycnemididae (8 spp.).

(6764) LUDWIG, H.W., 1989. *Tiere unserer Gewässer: Merkmale, Biologie, Lebensraum, Gefährdung.* 225 pp., col. figs throughout. BLV-Verlagsgesellschaft, München-Wien-Zürich, ISBN 3-405-13379-3. — Available from S.I.O. at Hfl. 52.- net.
This is a fieldguide for the identification of the common freshwater animal spp. of Central Europe, directed at the general reader. Only a part of the odon. fauna is covered (pp. 148-160, 33 col. figs of adults and larvae). The concise text is well styled, and contains also information on habitats, oviposition, life history, phenology, general distribution, etc. Morphological descriptions of ultimate instar larvae are good, and the fine watercolour habitus pictures of these are of particular interest.

(6765) MACHET, P., 1989. Contribution à l'étude des odonates de Guyane Française 1. Zygoptera. *Opusc. zool. flumin.* 40: 1-16. (With Engl. s.). — (65 Bd de la République, F-92210 Saint-Cloud).
The records of 38 spp., collected by a number of scientists since 1975 are listed, of which 20 spp. are new to French Guiana. Annotations and brief comments are provided for some of them. Female neallotypes are designated and described of Chalopteryx seabrai Santos & Machado, Acanthagrion indefensum Williamson and Oxyagrion egleri (Santos). It is suggested that the French Guiana material of Polythore picta (Ramb.) may be specifically distinct from the Peruvian populations.

(6766) *MARTINIA*. Bulletin de liaison des Odonatologues de France, No. 11 (March, 1989). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois d'Arcy).
Dommanget, J.-L.: La vie du bulletin (p. 1); — *Caupenne, M. & M. Prevost:* Observation d'Anax parthenope (Sélys, 1839) dans la Vienne (Odonata, Anisoptera: Aeshnidae) et mise à jour de la liste des odonates du département (pp. 3-8); — *Jacquemin, G.:* A propos d'une population de Somatochlora arctica (Zetterstedt, 1840) dans le Nord-Est de la France (Odonata, Anisoptera: Corduliidae) (pp. 9-15; — *Coppa, G.:* Complément à la liste des odonates des Ardennes (pp. 15-16); — *Coffin, J.:* Odonates nouveaux pour la Vaucluse et mise à jour de la liste des espèces observées dans ce département (pp. 17-22); — *Roche, B:* Trithemis annulata (Palisot de Beauvois, 1805): nouvelle espèce pour la Corse

et la faune de France (Odonata, Anisoptera: Libellulidae (pp. 23-24); *Boudier, F.:* Récolte d'exuvies intéressantes sur les bords du Cher dans le département du Loir-et-Cher (pp. 25--26); — *Duval, B.:* Compte-Rendu de la Réunion régionale d'Odonatologie du 20 novembre 1988 à Orléans (pp. 26-27); — *Dommanget, J.-L.:* Analyse d'ouvrage (p. 28; extensive review of the volume listed in *OA* 6134); — *Communiqués et annonces* (pp. 2, 8, 16, 22, 24).

(6767) MATSUKI, K., 1989. Descriptions of the larvae of two species of the genus Onychogomphus in Hongkong (Gomphidae, Odonata). *Gekkan Mushi* 215: 30-32. (Jap., with Engl. title & fig. captions). — (2-6-2-305 Fujisaki, Narashino, Chiba Pref., 275, JA).
The exuviae of O. sinicus and of an unidentified sp. are described, figured and compared with those of O. formosanus and O. viridicostus.

(6768) MÉTAYE, R., 1989. Premier inventaire des odonates du département de l'Aube. *Bull. Ent. champen.* 5(2): 61-62. — (307 rue du Fbg--Croncles, F-10000 Troyes).
List of 14 spp.

(6769) MICHIELS, N., 1989. *Populatie- en gedragsecologie van de Zwarte Heidelibel Sympetrum danae (Sulzer) (Odonata: Libellulidae)* — [*Population- and behavioural ecology of Sympetrum danae (Sulzer) (Odonata: Libellulidae)*]. PhD thesis, Univ. Antwerpen. XXX+202 pp. (The first chapter, pp. 1-50, in Dutch, the rest in Engl.) — (Dept Biol., Univ. Antwerpen, Universiteitsplein 1, B-2610 Wilrijk).
The book is organised into 9 chapters; the first of these is not supposed to appear elsewhere, the other 8 represent the author's earlier published papers, or they are in the press or in preparation for journal publication. Even so, the work is very well balanced, though it is unfortunate that the pagination is not consecutive, each chapter being paged "autonomously". This will certainly cause difficulties in citation. For the sake of convenience, in the Contents Table, an abbreviated "running title" is added to the original journal titles. These are as follows: "Population- and behavioural ecology of S. danae" (50 pp.), — "Emergence, longevity and maturation" (16 pp.), — "Population dynamics" (30 pp.), — "Sperm competition" (14 pp.), — "Genital morphology" (12 pp.), — "Activity patterns" (20 pp.), — "Duration of reproductive behavior" (18 pp.), — "Oviposition site selection" (22 pp.), — and "Mating success" (20 pp.). The "Emergence" paper was published as listed in *OA* 6716, "Sperm competition" in *OA* 6501, and the "Genital morphology" paper appeared in *Odonatologica* 18(1989): 21-31; the other papers appear here for the first time. — With this work the author undoubtedly placed himself among the most excellent of the young generation of odonate behaviourists.

(6770) MOORE, A.J., 1989. The behavioral ecology of Libellula luctuosa (Burmeister) (Odonata: Libellulidae): III. Male density, OSR, and male and female mating behavior. *Ethology* 80(1/4): 120-136). — (Dept Anthropol., Northwestern Univ., Evanston, IL 60208, USA).
In this pond dragonfly, the number of males at the mating site increased linearly during mating seasons. The number of fertilizable females in the population did not increase. An increasingly male biased operational sex ratio (OSR) therefore correlated with the increasing density of males. It is predicted that this would cause increased male-male competition and alter female mate choice. — Competition for territories influenced mating success in L. luctuosa. Two different mating strategies were adopted by males of L. luctuosa: some flew and defended lengths of shoreline (territorial males), and some perched and avoided male--male interactions (satellite males). Satellite males increased later in the season when all territories were occupied. However, no satellite ever switched to the territorial strategy and no territorial male ever became a satellite. At high male density, two males occasionally defended the same territory. The occupation of territories was nonrandom. The probability of any male mating depended on the time of year. Territory owners did most of the mating;

satellite males rarely mated. Postmating guarding of females by males depended on the number of conspecific males present. — Mating success of males was also influenced by female mating behavior, and female mating behavior was influenced by the number of males present. Females visited several males prior to mating. When fewer males were present females were more likely to reject male mating attempts. The length of copulation did not change during the mating season. At high male density, females spent less time ovipositing immediately after mating. Postcopulatory mate guarding by males increased the length of time the female spent ovipositing. These behavioral patterns may represent different strategies of mate choice, precopulatory mate choice at low male density and postcopulatory mate choice at high male density.

(6771) MORGAN, I.K., 1989. Dragonflies in Carmarthenshire in 1988. *Newsl. Dyfed Invert. Group.* 12: 9. — (4 Erw Las, Llwynhendy, Llanellt, Dyfed, SA14 9SF, UK).
Records of 5 spp. are briefly mentioned (Wales, UK).

(6772) *NEWSLETTER [OF THE] BRITISH DRAGONFLY SOCIETY,* No. 15 (Spring 1989). — (c/o Mrs R.I. Silsby, 1 Haydn Ave., Purley, Surrey, CR2 4AG, UK).
The issue contains 22 news sections, plus the modified text of BDS By-Laws Art. I. The 1989 Annual General Meeting is convened for Oct. 28, Dept Appl. Zool., Univ. Leeds. Most informative is the report on the 1988 Indoor Meeting, by *G. Vick,* which includes a good summary of *S. Brook*'s paper on "Urban dragonflies" of the London area. The "Special sightings" section is provided, as usually, by *A. Paine.* Of interest is the anonymous *(J. Silsby)* note on "Vagrants to Britain", stating that Hemianax ephippiger seems becoming quite a common visitor.

(6773) PAVLYUK, R.S., 1989. K sostavleniyu kadastra strekoz v Ukrainskoy SSR. — [On the set up of the dragonfly distribution retrieval in the Ukraininian SSR]. *Tez. Dokl. vsesoyuz. Soveshch Probl. Kadastra i Ucheta zhivot. Mira* 4: 214-216. (Russ.). — (Dept Invert. Zool., Lvov Univ., 4 Shcherebakov St., USSR-290005 Lvov).
The odon. fauna (70 spp.) of the Ukraine is inadequately known, particularly areas that were surveyed as far back as 50 years ago need to be re-examined. The status of the fauna of 12 biogeographic districts of the Republic is stated. It is emphasised that for the sake of species conservation, fauna inventories of Nature Reserves and National Parks are urgently required.

(6774) PILON, J.-G. & D. LAGACÉ, 1989. Notes sur les odonates de la région du réservoir Cabonga (Pontiac, Québec). *Fabreries* 14(1): 6-8. (With Engl. s.). — (Dép. Sci. biol., Univ. Montréal, C.P. 6128, Montréal, Qué., H3C 3J7, CA).
13 spp. from the Cabonga Reservoir region, Pontiac, are listed and briefly annotated.

(6775) PRITCHARD, G., 1989. The roles of temperature and diapause in the life history of a temperate-zone dragonfly: Argia vivida (Odonata: Coenagrionidae). *Ecol. Ent.* 14(1): 99-108. — (Dept Biol. Sci., Univ. Calgary, 2500 University Drive N.W., Calgary, Alberta, T2N 1N4, CA).
The life cycle generally took longer to complete in the field than was predicted on the basis of the thermal sum accumulated in laboratory rearing. — The prediction of a biovoltine life-cycle from geothermal sites with either a constant annual temperature of 26° C or thermal range of 11-31° C was not borne out because the intervention of short-day induced developmental delays in later larval instars extended the life cycle to 1 year. — This diapause, which synchronizes adult emergence with favourable summer temperatures, was also present in larvae from sites with annual temperature ranges of 0-33° C and 5-20° C. — At these colder sites completion of the life cycle takes 2 and 3 years respectively and dragonflies must be in cold-resistant stages during the winter. A long-day diapause, principally affecting late-instar larvae below a certain size during the summer, achieves this. — Large diurnal temperature fluctuations at the 0--33° C site markedly increase the useful ther-

mal energy available to larvae for growth over that predicted by the thermal sum equation. — The interaction between the effects of temperatures favourable for growth and day-length-governed diapause, synchronize the emergence of the low-temperature sensitive adult stage of this tropical dragonfly with northern-latitude summers at a variety of habitats.

(6776) SAHARON, D. & M.W. LUTTGES, 1989. Dragonfly unsteady aerodynamics: the role of the wing phase relations in controlling the produced flows. *Pap. Am. Inst. Aeronaut. Astronaut.* 89(0832): 1-19. — (Dept Aerospace Engin. Sci., Univ. Colorado, Boulder, Colorado 80309-0429, USA).
Visualizations of three-dimensional unsteady separated flow produced by a mechanically driven dragonfly wing kinematics model were collected and analyzed. Tandem wing effects were evaluated by comparison with effects produced by fore and aft wings tested individually. The effects of wing kinematics were studied with an emphasis on changes in the phase relations between fore and aft wings. Vortex structures produced by the mechanical model were quite similar to those elicited from tethered dragonflies in wind tunnel tests. The eight kinematic elements of the model wing beat were shortlived such that each yielded a specific transitional flow structure. Fore and aft wing phase differences produced flow structures that interacted, one with another, in differing ways. Flow interactions were either constructive or destructive and yielded different wing-flow interactions. Constructive flow interactions were evaluated in terms of integrating and fusing of vortex structures. Destructive flow interactions were evaluated in terms of vortex disruption, splitting and deflecting. The net results of these interactions were to enhance lift and thrust as seen in downwash and downstream flow structures.

(6777) SCHMIDT, E., 1989. Das "Rheinbacher Modell" zur Renaturierung eines kommunalen Regenrückhaltebeckens. *Natur & Landschaftsk.* 25: 5-12. — (Biol. Didaktik, Pädag. Fak., Univ. Bonn, Römerstr. 164, D-5300 Bonn-1, FRG).
The ecology and (2 yr) fauna succession of 2 man-made ponds nr Bonn, FRG are described. Sympetrum striolatum and Aeshna mixta oviposited already during filling up (Oct.) and emerged in July of the next yr. During the first 2 summers resp. 22 and 25 spp. were recorded (total 28 spp.), of which 18 spp. were autochthonous, partly in large populations.

(6778) SKRYL'KOV, A.I., 1989. O gel'mintofaune lichinok strekoz Troickogo vodohranilishcha. — [On the helminth fauna in dragonfly larvae of the Troicki Reservoir]. *In:* I.V. Nikolaeva, [Ed.], Nasekomye v biogeocenozah Urala, p. 61, Ural Sect. USSR Acad. Sci., Sverdlovsk. (Russ.). — (Author's address not stated).
During 1982-1986, 420 larvae, pertaining to 5 spp., were examined. Metacercariae were encountered in 8.5% of the individuals. Taxonomic names are stated neither of the hosts nor of the parasites.

(6779) SUHACHIOVA (SMIRNOVA) G.A., 1989. *Strekozy zapadno-sibirskoy lesostepi i ih troficheskie svyazi.* — [*Dragonflies of the West Siberian forest-steppe and their trophic relationships*]. Autoref. Diss. Kand. Biol. Nauk, IV+20 pp., Biol. Inst., Sib. Otd. Akad. Nauk SSR, Novosibirsk. (Russ.). — (Inst. Biol., Sib. Sect. USSR Acad. Sci., Ul. Frunse 11, USSR-630091 Novosibirsk).
This is the published synopsis of a M. Sc. thesis dealing with the fauna (62 spp.) of the Ural, Irtish and Obsk districts. The author's bibliography (6 titles) is appended.

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