

## ODONATOLOGICAL ABSTRACTS

### 1978

- (9190) HIGASHI, K., 1978. Daily food consumption of *Sympetrum frequens* Selys (Odonata: Libellulidae). *JIBP Synthesis* 18: 199-207. — (Dept Biol., Coll. Liberal Arts, Saga Univ., 1 Honjio, Saga, 840, JA).  
An attempt is made to estimate the food consumption at Minamata, Japan, by means of computer simulation, using the frequency of feeding flights and the mean weight of prey insects as well as by the daily change in dragonfly stomach contents.

### 1980

- (9191) DRESEEN, J., 1980. Die Tierwelt an vier Sandgruben im Landkreis Wittlich. *Dendrocopos* 7: 60-61. — (Forsthaus, D(W)-5521 Seinsfeld).  
13 odon. spp. are listed from 4 sand pits in the district of Wittlich, W. Germany.

### 1981

- (9192) LEMPERT, J., 1981. Libellen. *In*: J. Figgenger & F. von Berger, Mellumbericht 1981, pp. 16-19, Mellumrat, Oldenburg. — (Vereinsstr. 41, D-20357 Hamburg).  
This is a sequel to the report listed in OA 876, dealing with the 1981 (June, Aug.) observations. — The large *Ischnura pumilio* population, evidenced in the previous year, was now greatly reduced. The abundance of immigrant *Lestes barbarus*, *L. dryas* and *L. sponsa* was higher than expected on the basis of the neighbouring continental populations. Appreciable migratory

flights of *Sympetrum danae*, *S. flaveolum* and *S. vulgatum* occurred on Aug. 5-8 (also on open sea, against the wind!). — The subsequent reports were published by the same Author as follows: 1982, Libellen, *in*: K.E. Heers & V. Kullik, Mellumbericht 1982, pp. 19-21 [given the first record of *Lestes viridis* for the island]; — 1984, Odonata, *in*: U. Rüter, J. Figgenger & B. Tiemann, Mellumbericht 1984, pp. 166-167 [record of *Sympetrum fonscolombei*].

### 1983

- (9193) LEMPERT, J., 1983. Beobachtungen an Libellen. *In*: D. Grote, Jahresbericht für Wangerooge-Ost, pp. 220-223, Mellumrat, Oldenburg. — (Vereinsstr. 41, D-20357 Hamburg).  
An annotated and commented list is given of 17 spp. evidenced in July and Aug., 1983 at the Northsea island of Wangerooge, Germany. Diurnal behaviour and dormitories of *Sympetrum flaveolum* are described in considerable detail.

### 1986

- (9194) WHALLEY, P., 1986. Insects from the Italian Upper Trias. *Riv. Mus. civ. Sci. nat. "Enrico Caffi"* 10: 51-60. (With Ital.s.). — (Author retired from BMNH, his current address unknown).  
The paper deals almost exclusively with the odon., and all the specimens are probably referable to the same sp., i.e. *Italophlebia gervasuttii* gen.n., sp.n., placed into *Italophlebiidae* fam.n. Holotype ♂, paratype and other specimens: Argilliti di Riva di Solto formation, Lower Rhaetic,

20 km off Bergamo, Italy; deposited in Mus. Civ. Stor. Nat., Bergamo. The new sp. is described and illustrated in great detail, and the systematic position of the new fam. within the Hemiphlebioidea is discussed.

## 1988

(9195) BROCKHAUS, T. & J. HUBL, 1988. Beobachtungen am Waldsöllen im Kreis Strasburg. *Nat-SchutzArb. Mecklenburg* 31(1): 46-48. — (First Author: Markt 20/21, D-09111 Chemnitz). Record of 7 odon. spp., from 3 localities; Strasburg distr., eastern Germany.

(9196) PARK, W.-H., J.-W. LEE, D.-H. KIM & Y.-J. SHIN, 1988. A cytotoxic study of five species of the Korean Libellulidae (Odonata). *J. nat. Sci. Yeungnam Univ.* 8: 175-184. (Korean, with Engl.s. & fig. & tab. captions). — Dept Biol., Coll. Sci., Yeungnam Univ., Gyongsan, Cyongbuk, Korea).

On the basis of an abstract published in *Insecta koreana* (Suppl.) 3(1993), this paper is listed in OA 8926, but as it appears from the original publication the authorship there is wrong and incomplete. — The spp. studied are *Orthetrum albistylum speciosum*, *O. triangulare melania*, *Rhyothemis fuliginosa* (all n ♂ = 13), *Crocothemis s. servilia* and *Sympetrum e. eroticum* (both said to have n ♂ = 12). — (*Abstracter's Note*: This is a poor paper, containing several inaccuracies and contradictions. For example, it is said *Crocothemis s. servilia* has monocentric chromosomes, while in the other 4 spp. these are holocentric! In the Engl. text it is stated *C. s. servilia* has a haploid set of n=12 (which would correspond to the Japanese *C. s. mariannae!*), but in the "karyogram" (which is apparently based on very poor metaphase I micrographs) 13 elements are clearly shown. All spp. were studied previously, and the paper brings no new information of any kind.)

## 1989

(9197) MEDVEDEV, S.I., A.A. PETRUSENKO, J.V. BELKIN & I.A. KRYVICKI, 1989. *Osnovnye ekologicheskie osobennosti pitaniya ptic Kurgal'dzhinskogo zapovednika*. — *The main trophocoenotic peculiarities of birds from Kurgal-*

*djin Reservation*. Inst. Zool., Ukrain. Acad. Sci. [Preprint No. 89.15], Kiev. 60 pp. (Russ., with Engl.s.). — (Second Author: Dept Pop. Ecol., Schmalhausen Inst. Zool., Ukrain. Acad. Sci., B. Chmelnickogo Str. 15, UKR-252601 Kiev). 6 odon. taxa (some identified to the genus only) are mentioned as prey in a number of bird spp. from the Kurgaldjin Nature Reserve, Kazakhstan.

(9198) VON BALLMOOS, C., 1989. *Contribution à l'étude des odonates des tourbières ombrogènes: peuplement d'un haut-marais du Jura neuchâtelois (vallée de la Brévine)*. Trav. Licence, Univ. Neuchâtel. 162 pp. — (Lab. Ecol. anim. & Ent., Inst. Zool., Univ. Neuchâtel, Chantemerle 22, CH-2000 Neuchâtel).

The work deals with the odon. fauna of a marsh in the Jura Mts, canton Neuchâtel, Switzerland, but it is not available for abstracting.

(9199) WATERSTON, A.R. & A.R. PITTAWAY, 1989. The Odonata or dragonflies of Oman and neighbouring territories. *J. Oman Stud.* 10: 131-168. — (First Author: 9 Moray Place, Edinburgh, EH3 6DS, Scotland, UK; — Second Author: 2 Meadow Close, Moultsford nr Wallingford, Oxon, OX10 9JL, UK).

A comprehensive account is presented of the collections from Oman, the United Arab Emirates, Qatar, Bahrain Island, Kuwait and the Hasa, which are compared with those made in Saudi Arabia and in Yemen. *Enallagma somalicum amittinum* Waterston ssp.n. is described and illustrated (holotype ♂ & 3 ♂ paratypes: Oman, Dhofar prov., Ayun pools, alt. ca 620 m, 8-X-1977; allotype ♀: same prov., Wadi Sha'ath, 5-X-1979; all in RMS, Edinburgh). The distribution of most spp. is mapped, and a biogeographic analysis of the fauna is provided.

## 1990

(9200) NARAOKA, H., 1990. Studies on the ecology of the damselfly *Cercion sieboldi* Selys (Coenagrionidae: Odonata) in Aomori prefecture, northern Japan. 3. Ovipositing behavior. *New Entomol.* 39(1/2): 6-12. (Jap., with Engl.s.). — (36-71, Aza Motoizumi, Oaza Fukunoda, Itayanagi-machi, Kita-gun, Aomori, 038-36, JA). For pts 1 & 2 cf. OA 6096. — At Tsuruda,

Amori pref., oviposition mainly occurred between 10:00-15:00 h. 3 modes could be distinguished, viz. aerial (1.5%), water surface (71.1%) and submerged oviposition (26.4%). The total time required for the performance of all reproductive activities, from seizure to separation, varied between 38 min to 3 h 30 min. In Engl. summary (and Engl. tabs) the description is presented in considerable detail.

- (9201) VAN HARTEN, A., 1990. The inventory of the insect fauna of the Cape Verde Islands. *Courier Forsch.-Inst. Senckenberg* 129: 103-108. (With Germ.s.). — (Projecto Luta Integrada GTZ, Inst. Nac. Investig. Agraria, Sao Jorge dos Orgaos, Cape Verde Islands).  
So far 13 odon. spp. are known from the Cape Verde Islands, and 3 more are expected. A list is not given.

### 1991

- (9202) GRETZKE, R. & J. LIESENDAHL, 1991. Limnologisch-faunistische Untersuchungen an Fließgewässern im Grossraum Wuppertal. 1. Das Gelpe-System in Wuppertal und Remscheid. *Jber. naturw. Ver. Wuppertal* 44: 71-83. — (First Author: Winklerstr. 40, D(W)-5600 Wuppertal-2).  
From 2 ponds in the Gelpe R. system 4 odon. spp. are recorded; Northrhine-Westfalia, Germany. Detailed chemical data are given for the streams, but not for the neighbouring ponds.
- (9203) HOEBEL, W.-D., 1991. [Arteninventar der einzelnen NSG und FND des Saalkreises. Ergänzung zu den Artenlisten von 1988]. FND Heyersloch bei Beidersee. Libellen. *In*: F. Ebel & R. Schönbrodt, Pflanzen- und Tierarten der Naturschutzobjekte im Saalkreis. 1. Ergänzung, p. 51, Landratsamt des Saalkreises & Bot. Garten Martin-Luther-Univ. & Landesamt für Umweltschutz Sachsen-Anhalt, Halle. — (Kopernikusstr. 11, D(O)-4050 Halle).  
A checklist of 5 spp. from the "Heyersloch bei Beidersee" Nature Monument, Saal distr., Sachsen-Anhalt, Germany; without comments.
- (9204) HOEBEL, W.-D. & R. MEYER, 1991. [Verzeichnis der bisher in den NSG und FND des Saalkreises nachgewiesenen Pflanzen- und Tierarten. Ergänzung zur Artenliste von 1988]. Libellen (Odonata). *In*: F. Ebel & R. Schönbrodt, Pflanzen- und Tierarten der Naturschutzobjekte im Saalkreis. 1. Ergänzung, p. 17, Landratsamt des Saalkreises & Bot. Garten Martin-Luther-Univ. & Landesamt für Umweltschutz Sachsen-Anhalt, Halle. — (First Author: Kopernikusstr. 11, D(O)-4050 Halle).  
A checklist of 20 spp. recorded in nature reserves of the Saal distr., Sachsen-Anhalt, Germany; without comments.
- (9205) MEYER, R., 1991. [Arteninventar der einzelnen NSG und FND des Saalkreises. Ergänzung zu den Artenlisten von 1988]. NSG Franzigmark. Libellen. *In*: F. Ebel & R. Schönbrodt, Pflanzen- und Tierarten der Naturschutzobjekte im Saalkreis. 1. Ergänzung, p. 26, Landratsamt des Saalkreises & Bot. Garten Martin-Luther-Univ. & Landesamt für Umweltschutz Sachsen-Anhalt, Halle. — (Schulam, Magistrat d. Stadt Halle, Schulumweltzentrum, D(O)-4020 Halle).  
A checklist of 18 spp. recorded in the Franzigmark Nature Reserve, Saal distr., Sachsen-Anhalt, Germany; without comments.
- (9206) MOLA, L.M., 1991. Variacion cariotipica en el contenido de ADN en tres especies de Aeshna (Odonata). *Resum. 22 Congr. anual Soc. Argent. Genét. Catamarca*, p. 10. — (Bulnes 761 10<sup>o</sup>A", AR-1176 Buenos Aires).  
The DNA values were identified in *A. confusa* (n=14), *A. bonariensis* (n=13) and *A. cornigera planaltica* (n=8). These are not significantly different, irrespective of the chromosome numbers.
- (9207) TSUBUKI, T., 1991. Diurnal activity of the libellulid dragonfly, *Sympetrum frequens* Selys (Odonata). *New Entomol.* 40(3/4): 24-30. (Jap., with Engl.s., tabs & fig. captions). — (Author's address not transliterated).  
The observations were carried out in a meadow on the Yunomaru Heights (alt. 1750 m), nr the city of Tobu, Nagano pref., in Aug. 1978-1990, during 23 days. — The dragonflies started to fly from the larches down to the grass, inconspicuously, one-by-one, at approx. 06.30 h. Between 15:00-17:30 h they flew back to the larch forest, and aggregated there in groups up to 10

individuals. The daily flight activity was bimodal, with peaks at 07:00-09:00 and 16.00-17:00. The daily feeding activity also showed a bimodal pattern, with peaks at 06:30-08:40 and 16:20-17:10. Since the feeding commenced earlier than the general flight activity, it is tentatively assumed, the dragonflies caught their prey while perched, i.e. before they started with the normal flight activity. During the rain, they were hanging on grass or in trees. The ♀ were slightly in excess, but sex ratio is probably conditioned by the difference in ♂ and ♀ activities, therefore it was changing with time. — Cf. also *OA* 7333.

- (9208) WEITZ, W., 1991. Libellen an Bach und Fluss. *Heimatkalendar Landkreis Birkenfeld* 1992: 97-102. — (Finkenweg 27, D-55768 Hepstädten-Weihersbach).  
Deals with 8 spp. from the upper Nahe R., between Neubrücke and Idar-Oberstein, Rhineland-Palatinate, Germany.

## 1992

- (9209) AMBRUS, A. & K. BANKUTI, 1992. Adatok a Nyugat-Dunántúli Odonata faunájának ismeretéhez. — Data to the knowledge of Odonata fauna of West-Transdanubia. *Fol. Hist.-nat. Mus. Matr.* 17: 167-172. (Hung., with Engl.s.). — (Second Author: Matra Muz., Kossuth u. 40, HU-3200 Gyöngyös).  
An annotated list of 34 spp. from 15 localities in the Transdanubian region of Hungary.
- (9210) AMBRUS, A., K. BÁNKUTI & T. KOVACS, 1992. Adatok a magyarországi Cordulegaster fajok lárváinak anatómiájához (Odonata). — Data to the anatomy of Hungarian Cordulegaster species. *Fol. Hist.-nat. Mus. Matr.* 17: 177-180. (Hung., with Engl.s.). — (Second Author: Matra Muz., Kossuth u. 40, HU-3200 Gyöngyös).  
Structural peculiarities of the ultimate larval instars of *Cordulegaster bidentata* and *C.h.heros* are described and illustrated. The latter sp. has been previously referred to from Hungary as "C. boltonii" and "C. annulatus".
- (9211) ANHOLT, B.R., 1992. Sex and habitat differences in feeding by an adult dragonfly. *Oikos* 65: 428-432. — (Dept Biol., Queen's Univ., Kingston, ON, K7L 3N6, CA).  
*Enallagma boreale* material was collected at a bog pond in the Malcolm Knapp Research Forest of the UBC, nr Haney, BC, Canada. Adult ♂ and ♀ differ in mass at sexual maturity but not at emergence. This could be the result of differential feeding behaviour or allocation of resources. To separate these two possibilities animals were collected on six dates over the course of one flight season. Collections were made at a pond where reproduction occurs and on an adjacent hillside. Females had on average 25% more in their guts than did males. Both males and females away from the pond had more in their guts than those at the pond. Among males at the pond there was no difference in mean gut contents between mated and unmated individuals. The risk-sensitivity of foraging in many animals suggests that it is inherently dangerous. Differences in foraging rate as described here could result in differences in mortality rates that would change population sex ratios and ultimately mating systems.
- (9212) ARAI, Y., 1992. [The behaviour of *Mnais* larvae close before the emergence]. *Insectarium, Tokyo* 29(7): 213. (Jap.). — (1233-2 Sueno, Yorii-machi, Oosato-gun, Saitama, 369-12, JA).  
Based on field observations, the larvae seem to spend several days prior to emergence on land. A col. phot. is also provided.
- (9213) ARAI, Y., 1992. [The hatching rate in *Sympecma paedisca* Br. (Lestidae). 2.] *Gekkan-Mushi* 260: 38. (Jap.). — (1233-2 Sueno, Yorii-machi, Oosato-gun, Saitama, 369-12, JA).  
Additions to the paper listed in *OA* 8482, with a detailed tab.
- (9214) ARAI, Y., 1992. [A record of *Anax guttatus* (Burm.) from Chichibu City, Saitama pref., Honshu]. *Gekkan-Mushi* 262: 6. (Jap.). — 1233-2 Sueno, Yorii-machi, Oosato-gun, Saitama, 369-12, JA).  
1 ♂ (21-VII-1992), with a photograph.
- (9215) ARAI, Y., Y. HIROSE & S. SUDA, 1992. [Records of *Oligoaeschna pryleri* (Martin) larvae in Sayama Hills, Saitama pref., Honshu]. *Gekkan-Mushi* 257: 35. (Jap.). — (First Author: 1233-2 Sueno, Yorii-machi, Oosato-gun, Sai-

tama, 369-12, JA).

Numerous larvae were collected in temporary ponds and under the fallen leaves near the ponds.

The ultimate larval instars of the 2 spp. are described, illustrated and their structural peculiarities are pointed out.

- (9216) AZEVEDO-RAMOS, C., M. VAN SLUYS, J.-M. HERO & W.E. MAGNUSSON, 1992. Influence of tadpole movement on predation by odonate naiads. *J. Herpetol.* 26(3): 335-338. — (First Author: Setor Herpetol., Depto Zool., Museu Paraense "Emilio Goeldi", Caixa Postal 399, BR-66044 Belém, Pará).

*Gynacantha membranalis* larvae were used as predators in experiments with the tadpoles of *Osteocephalus aurinus*, *Ololygon rubra*, *Phyllo-medusa tarsius* and *Hyla geographica*. There were large differences among the spp. both in average distance covered per time unit (ADT) and in survival. It is advantageous for tadpoles exposed to odon. predation to have few movements and/or to move rapidly from place to place. They also show ontogenetic variation in vulnerability to predation: the decrease in swimming ability and velocity during metamorphic climax increases the risk of predation, i.e. the uniform, relatively slow movements reduce tadpole survival. A reference is made also to other prey characteristics (colour, density, size) that influence predator's choice.

- (9217) AZUMA, A., 1992. *The biokinetics of flying and swimming*. Springer, Tokyo-Berlin-Heidelberg-New York-London-Paris-Hong Kong-Barcelona-Budapest. xviii+265 pp. — ISBN 4-431-70106-0. — Price: DM 280.- net. — (Author: 37-3 Miyako-cho, Saiwai-ku, Kawasaki-210, JA).

In the chapters "Flight by beating" and "Jetting", the situation in adult and larval odon. is dealt with in great detail.

- (9218) BÁNKUTI, K., 1992. A *Coenagrion ornatum* (Sélys-Longchamps, 1850) és a *Coenagrion mercuriale* (Charpentier, 1840) lárváinak anatómiai vizsgálata (Odonata). — Anatomical investigation of larvae of *Coenagrion ornatum* (Sélys-Longchamps, 1850) and *Coenagrion mercuriale* (Charpentier, 1840). *Fol. hist.-nat. Mus. Matr.* 17: 163-166. (Hung., with Engl.s.). — (Matra Muz., Kossuth u. 40, HU-3200 Gyöngyös).

- (9219) BÁNKUTI, K., 1992. Adatok Magyarország Odonata faunájához. 2. — Data to the Odonata fauna of Hungary, 2. *Fol. Hist.-nat. Mus. Matr.* 17: 173-176. (Hung., with Engl.s.). — (Matra Muz., Kossuth u. 40, HU-3200 Gyöngyös).

This is the second paper in the series as listed in OA 8322. Records are presented for 37 spp. from various Hungarian localities. The *Cordulegaster bidentata* population in the Bakony Mts is noteworthy, while the very rare *Sympetrum danae* was recorded in 1991 from a number of localities in northern Hungary.

- (9220) BÁNKUTI, K., 1992. Érsekvadkert környéke Odonata faunája. — The Odonata fauna of the vicinity of Érsekvadkert. *Fol. Hist.-nat. Mus. Matr.* 17: 155-162. (Hung., with Engl.s.). — (Matra Muz., Kossuth u. 40, HU-3200 Gyöngyös).

A commented list of 32 spp. from this region in Hungary. Of particular local interest are the records of *Coenagrion ornatum*, *C. scitulum*, *Gomphus vulgatissimus*, *Anax parthenope*, *Epi-theca bimaculata*, *Somatochlora metallica* and *Libellula fulva*.

- (9221) BEGUM, A., M.A. BASHAR & V. BISWAS, 1992. Emergence pattern of some dragonfly nymphs (Odonata: Anisoptera) in Ramna Lake of Dhaka City. *Dhaka Univ. J. Biol. Sci.* 1(1): 19-24. — (Third Author: Dept Zool., Govt P.G. Coll., Bagerhat-9301, Khulna, Bangladesh).

*Tholymis tillarga*, *Rhodothemis rufa*, *Brachythemis contaminata* and *Ictinus* sp. emerged throughout the year, while *Neurothemis t. tullia*, *Diplacodes nebulosa* and *Crocothemis s. servilia* usually emerged during specific months only.

- (9222) BÖTTGER, K. & R. PÖPPERL, 1992. Aussagen zum Natürlichkeitsgrad von Bächen anhand rheotypischer Faunenelemente, dargestellt unter besonderer Berücksichtigung der Tieflandsbäche Schleswig-Holsteins. *Limnologie aktuell* 3: 159-165. (With Engl.s.). — (Zool. Inst., Univ. Kiel, Olshausenstr. 40, D(W)-2300 Kiel).

*Calopteryx splendens* and *Gomphus vulgatissi-*

- mus are considered indicators for undisturbed condition of natural brooks in the lowlands of northern Germany and central Europe. 53 other macroinvertebrate (mostly insect) spp. are also listed as indicators in the water quality assessment, and the complexity of the subject is briefly discussed.
- (9223) DEGANI, G., G.N. HERBST, R. ORTAL, H.J. BROMLEY, D. LEVANON, H. GLAZMAN & Y. REGEV, 1992. Faunal relationships to abiotic factors along the river Dan in northern Israel. *Hydrobiologia* 246: 69-82. — (First Author: Migal Lab., Kiryat Shmona, Israel). Epallage fatime is recorded from the upper (of the 6) sampling stations on the Dan R., Israel.
- (9224) ESSER, B. & V. HÜSING, 1992. Die Bewertung des ökologischen Zustandes von Fließgewässern am Beispiel des Aa-Johannisbach-Gewässersystems in Bielefeld. *Limnologie aktuell* 3: 285-298. (With Engl.s.). — (Staatliches Amt für Wasser- & Abfallwirtschaft, Büntestr. 1, D(W)-4950 Minden). The odon. fauna consists of 12 spp., of which *Calopteryx splendens* is the sole rheophilous one, occurring mainly in those sections of the Aa R. where there are no human settlements (Northrhine-Westfalia, Germany). The other spp. are not listed.
- (9225) FLEITUCH, T.M., 1992. Evaluation of the water quality of future tributaries to the planned Dobczyce reservoir (Poland) using macroinvertebrates. *Hydrobiologia* 237: 103-116. — (Inst. Freshw. Biol., Pol. Acad. Sci., PO-31016 Kraków). *Calopteryx splendens* is recorded from Brzezówka, in the Raba R. catchment basin, Poland.
- (9226) HAWKING, J.H., 1992. *A preliminary guide to the identification of dragonfly larvae (Odonata) from the Alligator Rivers Region of the Northern Territory*. Office Supervising Scientist Alligator Rivers Region, Jabiru [Open File Rec. No. 102]: vi+87 pp., 14 col. pls incl. — (Murray-Darling Freshw. Res. Cent., P.O. Box 921, Albury, N.S.W., 2640, AU). An identification key and descriptions are given for the 66 hitherto known regional spp., incl. 35 spp., the larvae of which are here described for the first time. Notes on ecology and locality data for each sp. are also provided.
- (9227) KANOU, K., 1992. [A note on oviposition behaviour in *Boyeria maclachlani* Sel. in Hayama-machi, Kanagawa pref., Honshu]. *Gekkan-Mushi* 261: 35-36. (Jap.). — (5-19-17-601 Koishikawa, Bunkyo-ku, Tokyo, 112, JA). A field note, with 2 photographs.
- (9228) KANOU, K. & H. KITA, 1992. [Observation of a territorial behaviour of *Onychogomphus viridicostus* Oguma (Gomphidae) on a wet road in Yorii-machi, Saitama pref., Honshu]. *Gekkan-Mushi* 260: 36-37. (Jap.). — (First Author: 5-19-17-601 Koishikawa, Bunkyo-ku, Tokyo, 112, JA). Circumstantial evidence, with 2 photographs.
- (9229) KHALIQ, A., A. HAYAT & A. HUSSAIN, 1992. Some dragon flies of district Mansehra (N.W.F.P.). *Pakistan J. Forest.* 1992: 74-77. — (Dept Ent., Univ. Coll. Agric., Rawalakot, Azad Kashmir, Pakistan). 24 spp. are listed, and their distribution in the district of Mansehra, North-West Frontier Prov., is shown in a tab. *Ictinogomphus angulosus* is new for Pakistan.
- (9230) KONIG, A., 1992. Die Libellenfauna im Abbaugebiet Haidgauer Ried des Wurzacher Riedes. *Telma* 22: 109-122. (With Engl.s.). — (Himbach 7, D-88410 Bad Wurzbach). The odon. community (23 spp.) of the peat winning area and the adjacent rised bog in the Wurzacher Ried Nature Reserve (Upper Svabia, Germany) is analysed. The investigations were carried out in the framework of a renaturalisation project, commenced in 1991. — Cf. also OA 9287.
- (9231) MOLA, L.M. & A. PAPESCHI, 1992. Distintas tendencias evolutivas de los sistemas cromosomicos de determinacion del sexo en Heteroptera y Odonata. *Resum. 23 Cong. anual Soc. Argent. Genér.* [place not stated], p. 71. — (First Author: Bulnes 761 10° "A", AR-1176 Buenos Aires). The chromosomes of the 2 orders are considered holokinetic. The modes of sex determination in the examined Heter. spp. are XO/XX, XY/XX and X<sub>1</sub>X<sub>2</sub>Y/X<sub>1</sub>X<sub>1</sub>Y<sub>2</sub>Y<sub>2</sub>, while in the Odon. only

in a few spp. the original XO/XX evolved into a neo-XY/neo-X system.

- (9232) MUŽINIĆ, J. & J. JAŠAJSKI, 1992. On food and feeding habits of the White Stork, *Ciconia c. ciconia*, in the central Balkans. *Ecol. Birds* 14: 211-223. — (First Author: Inst. Ornithol.), CASA, CRO-41000 Zagreb, Croatia). 504 pellets were collected from 257 active nests at 59 localities in Croatia, Serbia, Kosovo and Macedonia. The bird feeds on a great variety of animal spp. In young individuals, the first pellets were composed mainly of insects, incl. *Libellula* sp. On all the investigated sites, the storks were found to feed also on "3 other *Libellula* spp.". In some pellets from Voivodina (Serbia) *Calopteryx virgo* was also recorded.
- (9233) PETERSON, A.G., C.M. BULL & L.M. WHEELER, 1992. Habitat choice and predator avoidance in tadpoles. *J. Herpetol.* 26(2): 142-146. — (Sch. Biol. Sci., Flinders Univ., G.P.O. Box 2100, Adelaide, Sth Austr. 5001, AU). Larvae of *Ranidella signifera* and *Litoria ewingi* are common members of tadpole communities of temporary ponds in southeastern Australia, where odonate larvae are the major predators. In field surveys, *R. signifera* was found more often on the pond substrate than was *L. ewingi*. This difference in habitat choice was documented further in laboratory aquaria. Including a simulated pond edge. For both species, substrate use increased in the dark phase of a 12:12 photoperiod. In the laboratory, *L. ewingi* suffered heavier predation from the corduliid odonate *Hemicordulia tau*, a benthic predator, than did *R. signifera*. Predation on *L. ewingi*, but not on *R. signifera*, declined as water depth increased, implying that *L. ewingi* use the water column to escape benthic predators. Overall predation rate was greater in the dark phase when the predators were more active, and when tadpoles used the substrate more.
- (9234) SPURIS, Z., 1992 [published June 1993]. Ministri lemj par spārēm. — [Ministers decide on dragonflies]. *Atklājums* 4: 72. (Latvian). — (Miera iela 19-6, LV-2169 Salaspils). Latvian translation of Recommendation No. R (87)14, "On the protection of dragonflies (Odonata) and their biotopes", issued by the Council of Europe, June 25, 1987 (cf. *Notul. odonatol.* 3[1988]: 1-2), with a brief introductory note by the Author.
- (9235) TOGAME, S., 1992. [A note on mating and egg-laying behaviour in *Pseudagrion p. pillidorsum* (Br.) in Okinawa]. *Gekkan-Mushi* 262: 14-15. (Jap.). — (2-10-20 Takatsukasa, Takarazuka City, Hyogo, 665, JA). A brief observation on submerged oviposition.
- (9236) TROCKUR, B., 1992. Bemerkenswertes über Libellen. *NatSchutz Saarland* 22(3): 8. — (Schulstr. 4, D-66636 Tholey-Scheuern). *Sympetma fusca*, *Cercion lindenii*, *Gomphus vulgatissimus*, *Brachytron pratense*, *Crocotemis erythraea* and *Epitheca bimaculata* are reported from various localities in Saarland, Germany. In 1992, the latter sp. was recorded at 12 localities and it is rapidly expanding its range in the region.
- (9237) VAN BUSKIRK, J., 1992. Competition, cannibalism, and size class dominance in a dragonfly. *Oikos* 65: 455-465. — (Inst. Ecosyst. Stud., Box AB, Millbrook, NY 12545, USA). The consequences of size class interactions among *Aeshna juncea* larvae in splash pools on the shore of Isle Royale, in Lake Superior, USA, are reported. The sp. has a 3-yr life cycle, and there was a close correspondence between age and size classes. Observations of dragonfly behavior and samples of fecal contents both suggested that larvae were aggressive toward conspecifics and that cannibalism was common. Experiments in plastic containers and natural pools demonstrated that 2-yr-old dragonflies were more secretive and experienced higher mortality in the presence of larger 3-yr-old larvae. Small larvae in the field avoided encountering large larvae by feeding more often in the day and by reducing their activity. The lower activity levels of small larvae entailed a cost of reduced feeding success. There was a striking 2-yr cycle in the age structure of the natural pools, suggesting that only adjacent year classes interacted strongly. These results show how competition influences the behavior, larval performance, and population size structure of *A.*

juncea at Isle Royale.

- (9238) VERDONSCHOT, P.F.M., L.W.G. HIGLER, W.F. VAN DER HOEK & J.G.M. CUPPEN, 1992. A list of macroinvertebrates in Dutch water types: a first step towards an ecological classification of surface waters based on key factors. *Hydrobiol. Bull.* 25(3): 241-259. — (Dept Hydrobiol., Inst. Forest. & Nat. Res., P.O. Box 46, NL-3956 ZR Leersum).  
An ecological classification of surface waters in The Netherlands is presented. The classification is based on literature data and the authors' opinions concerning the habitat range of macroinvertebrate taxa. Water types were defined by key factors. Taxa were assigned to these water types and provided with a characterizing weight. The list may be a useful tool in the ecological management of waters and includes a considerable number of odon. spp.
- (9239) WEITZ, W., 1992. Libellen an Teich und Tümpel. *Heimatkalendar Landkreis Birkenfeld* 1993: 101-109. — Finkenweg 27, D-55768 Hoppstädten-Weiersbach).  
General, on dragonfly fauna of garden and natural ponds in Rhineland-Palatinate, with a checklist of 31 spp. known from the Birkenfeld distr., Germany.
- (9240) YAMAMOTO, Y., 1992. [A note on a unique prey in female *Anax n. nigrofasciatus* Oguma]. *Gekkan-Mushi* 253: 22-23. (Jap.). — (Inafune-biru, 1-2 Inafune-tori, Chigusa-ku, Nagoya, 464, JA).  
A very detailed description, with a phot. and a graph, of an *Anax* ♀ devouring *Sieboldius albardae*; Toyoda City, Aichi pref., Honshu.
- (9241) YOKOI, N., T. MIYAHATA & N. OSAWA, 1992. [A note on the early morning adult behaviour of *Macromidia ishidae* Asahina (Corduliidae) in Ishigaki-jima, Ryukyu Islands]. *Gekkan-Mushi* 260: 37-38. (Jap.). — (First Author: 122-22-1 Oki-machi, Watari City, Fukushima, 960, JA).  
Several mature adults were seen flying actively along a mountain stream both in the early morning and in the early evening.
- (9242) YOSHIMATSU, S., 1992. Insects captured on the seas around Japan, with special reference to Lepidoptera. *Insectarium, Tokyo* 29(6): 12-17. (Jap., with Engl. title). — (Inst. Agricultural Environ., Ministry Agric., Fores. & Fish., 3-1-1 Kannondai, Tsukuba City, Ibaragi, 305, JA).  
The results of a governmental research project on the long-distance insect migration in the East China Sea and the Japan Sea (1983-1987) are stated. The odon. spp. mentioned are *Anax parthenope julius*, *Pantala flavescens* and *Tramea virginea*.

### 1993

- (9243) ABSTRACT OF PAPERS [read at] the Twelfth International Symposium of Odonatology, Osaka, Japan, 1993. Edited by K. Inoue. Issued by the Societas Internationalis Odonatologica (S.I.O.), Osaka, Japan. x+54 pp. — Price: Hfl. 50.- (incl. the "Program & Generalities" and the Field Trip Handbook; cf OA 9318, 9265). — (Orders to: SIO Central Office, P.O. Box 256, NL-3720 AG Bilthoven).  
*Aoki, T.*: The expansion of *Ictinogomphus pertinax* (Selys) in the region around Osaka Bay (p. 1); — *Arai, Y.*: Do larvae of a dragonfly, *Stylogomphus suzukii*, migrate downstream?; — *Bernard, R.*: Analysis of species composition and distribution of dragonflies in Poland: selected mediterranean species (p. 3); — *Carchini, G., M.J. Samways & M. Di Domenico*: Description of the last instar larva of *Agrionemis pinhey* [sic!] Balinsky, 1963 (Zygoptera: Coenagrionidae, Agrionemidinae) (p. 4); — *Carius, W.*: Evolutionary relationships between European species of genus *Aeshna* Fabricius, 1775 (Odonata, Aeshnidae) (p. 5); — *Chowdhury, S.H. & I. Mia*: Effect of hunger level and previous dietary experience on food preference and rate of feeding in larvae of *Hydrobasileus* sp. (p. 6); — *Cobolli, M., E. De Matthaeis, C. Utzeri & G. Carchini*: Genetic differentiation and systematics in the palaearctic *Coenagrionidae* (p. 7); — *Cordero, A., S. Santolamazza & C. Utzeri*: A descriptive analysis of the copulatory sequence in *Coenagrion scitulum* (p. 8); — Repeated insemination and sperm competition in the damselfly *Coenagrion scitulum* (p. 9); — *Di Domenico, M., G. Carchini & M.J. Samways*: Description of the last instar larva of *Phyllogomphus brunneus* Pinhey, 1876 (An-



- isoptera: Gomphidae (p. 10); — *González-Soriano, E.*: A recent overview to the Odonata of Mexico (pp. 10-11); — *Hartung, M.*: What is the true *Lestes virens virens* (Charpentier, 1825)? (pp. 11-12); — *Hatto, Y.*: Preservation of a traditional method of dragonfly catching in Japan (pp. 12-13); — *Higashi, K. & K. Yoshida*: On the foundation of Dragonfly-Kingdom, Saga (p. 13; title only); — *Higashi, T. & M. Watanabe*: Fecundity and oviposition in three skimmers, *Orthetrum japonicum*, *O. albistylum* and *O. triangulare* (Anisoptera: Libellulidae) (p. 14); — *Hilfert, D. & G. Ruppell*: Analysis of flight-films on *Epiophlebia superstes* (Selys), ethological and phylogenetic aspects (p. 15); — *Inoue, K.*: Sewage treatment plant demonstrates the safety of treated water with dragonflies as a bioindicator (p. 16); — *Ishizawa, N.*: female dimorphism and physiological colour change in a dragonfly, *Sympetrum frequens* (Selys) (p. 17); — *Komatsu, K. & T. Matsura*: The ecology of the larvae and adults of dragonfly *Sympetrum striolatum imitoides* in a swimming pool of the primary school (pp. 17-18); — *Komnick, H. & R. Fischer*: Peroxisomal chain-shortening of dietary fatty acids on the absorptive pathway through the midgut epithelium of *Aeshna cyanea* (pp. 18-19); — *Komnick, H. & D. Wachtmann*: Absorption and assimilation of fatty alcohol by *Aeshna cyanea* larvae (pp. 19-20); — *Langenbach, A.*: Behavioural ecology of *Ischnura pumilio* (Charpentier) with special reference to the female colour change (Odonata: Zygoptera) (pp. 20-21); — *Lindeboom, M.*: How about *Calopteryx* hybrids (p. 21); — *Lohmann, H.*: Revision of the Cordulegastridae (pp. 21-22); — *Martens, A.*: Field experiments on oviposition site selection on *Nuphar lutea* in *Platycnemis pennipes* (Zygoptera: Platycnemididae) (p. 22); — *May, M.L.*: Understanding the taxonomic significance of the male caudal appendages of Zygoptera — the case of *Enallagma* (p. 23); — *May, M.L. & J.J. Cook*: Notes on some characters of possible taxonomic importance in the Corduliidae (p. 24); — *Mimura, Y. & M. Watanabe*: Number and size of eggs in the three emerald damselflies, *Lestes sponsa*, *L. temporalis* and *L. japonicus* (Zygoptera: Lestidae) (pp. 24-25); — *Miyakawa, K.*: Autumnal migration of mature *Sympetrum frequens* Selys in western Kanto Plain (p. 25); — *Miyazaki, T.*: Distribution patterns of Japanese Odonata (p. 26); — *Novelo-Gutierrez, R.*: The larva of *Amphipteryx* (Zyg., Amphipterygidae): its relationships to other members of the family and some biogeographical considerations (pp. 27-28); — *Osada, M., S. Mori & T. Umeda*: Creation of natural ecosystem on the waterside space through inhabitant environment of dragonflies — a case of Honmoku Park in Yokohama City, Japan (p. 28); — *Ott, J.*: Do dragonflies have a chance in industrialized countries? (p. 29); — *Pilon, J.-G. & D. Laçacé*: Structure of adult odonate communities of the subarctic zone of Quebec (pp. 29-30); — *Pinratana, A.*: Odonata of Thailand (p. 30); — *Rehfeldt, G.*: Mass swarming and reproductive tactics of males in *Sympetrum depressiusculum* (pp. 30-31); — *Rojanavongse, V. & S. Divasiri*: Preliminary study on Broad-winged Damselflies (Zygoptera, Calopterygoidea) at Khao Yai National Park of Thailand (p. 31); — *Ruppell, G. & U. Anders*: Comparison of the courtship-flight of four European *Calopteryx*-species: ethological and phylogenetic aspects (p. 32); — *Sahlén, G.*: The eggshell of the Odonata — a comparison between endophytic and exophytic eggs (p. 33); — *Samraoui, B., S. Bouzid, R. Boulahbal & P.S. Corbet*: Seasonal migration and pre-reproductive diapause in *Aeshna mixta*, *Sympetrum meridionale* and *S. striolatum* as an adaptation to the mediterranean climate (N.E. Algeria) (pp. 33-34); — *Samways, M.J.*: Typicalness versus endemism in the conservation of dragonflies (pp. 34-35); — *Sato, M. & A. Azuma*: The flight performance and a damselfly, *Cerriagrion melanurum* Selys (pp. 35-36); — *Schmidt, E.G.*: The ecological niche of *Sympetrum depressiusculum* (Selys, 1841) at a carp breeding pond in NW-Germany (pp. 36-37); — *Schridde, P.*: Factors of competition and coexistence among larval *Orthetrum brunneum* (Fonscolombe, 1837) and *Orthetrum coerulescens* (Fabricius, 1798) (pp. 37-38); — *Seki, T. & S. Ohana*: Two kinds of retinals used as the chromophore of visual pigments in a compound eye of the dragonfly (pp. 38-39); — *Silshy, J.*: A study of the genus *Chlorolestes* Selys in southern Africa (pp. 39-40); — *Suhling, F.*: Effects of predators on spatial distribution of the larvae of two species of *Onychogomphus* (Gomphidae) (p. 40); — *Taguchi, M., T. Kobayashi, T. Koyata, S. Taka-*

- hashi, N. Kourushi & M. Watanabe: Mating behaviour in males and the mate refusing behavior by females of the dragonfly, *Sympetrum pedemontanum elatum* Selys (p. 41); — Thompson, D.J.: Lifetime reproductive success and fitness in dragonflies (p. 42); — Tsuda, S., T. Aoki, S. Nishu & I. Kanazawa: Some examples of practical use of personal computer in odonatology (pp. 42-43); — Ubukata, H. & I. Sonehara: A comparison of alpine and "upper subalpine" zone dragonflies among Hokkaido, central Honshu and Swiss Alps (pp. 43-44); — Ueda, T.: Territoriality and reproductive behaviour in *Rhinocypha biseriata* Selys (Odonata: Chlorocyphidae) (p. 45); — Valtonen, P.: Wing venational characters of European species of the genus *Aeshna* (pp. 46-47); — Van Tol, Biogeography and phylogeny of the western Malesian species of *Procordulia* Martin (Odonata: Corduliidae) (p. 47); — Wachtmann, D. & H. Komnick: Effects of oleyl alcohol on the intestinal absorption of [ $1-^{14}C$ ] oleic acid and its transport from the haemolymph of dragonfly larvae (p. 48); — Watanabe, K.: Some dragonfly species expanding their range in the Ryukyus, Japan (p. 49); — Thermoregulation and habitat preference in two wing color forms of *Mnais* damselflies and *Calopteryx japonica* (Zygoptera: Calopterygidae) (pp. 49-50); — Observation on the embryonic development of the nymphal labium in several Japanese dragonflies (p. 50); — Watson, J.A.L.: Australian dragonflies (Odonata) (p. 51); — Wilson, K.D.: The *Macromia* and gomphine populations newly recorded from Hong Kong at two highly reproductive streams with details of site characteristics and developmental threats (p. 52); — Zessin, W.: The oldest known giant dragonflies (Odonata, Meganisoptera) (p. 53); — Informal Presentations (p. 54; titles only): Cordero, A.: The reproductive behaviour of *Coenagrion scitulum*; — Matsuda, I.: Tombo-tsuri (Catching dragonflies by threads); — Lempert, J. Reproductive behaviour and ecology of odonates in tropical rain-forest of Liberia, West Africa; — Miyazaki, T.: Why was Japan called "Akitsu-shima" (Dragonfly Island) in ancient ages; — Ohno, T.: *Epiophlebia superstes* and *Macromia daimoji* in slow motion; — Rudolph, R., G. Rüppell & D. Hilfert: Reproductive strategies of *Calopteryx comelia* and sympatric *Mnais* species; — Rüppell, G. & D. Hilfert: Dragonflies — life in flight; — Sahlén, G.: Some dragonflies and their environments in Sweden; — Tokai TV Co.: *Epiophlebia superstes*; — Watanabe, Y.: Hatching of some Japanese dragonflies; — Yagi, T.: Hibernating damselflies, display, oviposition of 2 species of *Ictinogomphus* and being predated; — Yoshida, M.: Dragonflies in Hokkaido.
- (9244) AIDA, M., 1993. Further notes on *Stylurus nagoyanus* (Asahina) from the Noubi Plains, central Japan. *Gekkan-Mushi* 271: 19-23. (Jap., with Engl. title). — (Sakae 1-7-15, Ichinomiya-shi, Aichi, 491, JA).  
This is the third paper in a series (cf. OA 7375, 7481). An abstract is not available.
- (9245) AMBRUS, A., K. BÁNKUTI & T. KOVACS, 1993. The larva collection of Odonata of the Hungarian Natural History Museum. *Fol. ent. hung.* 54: 5-8. — (Second Author: Matra Muz., Kossuth u. 40, HU-3200 Gyöngyös).  
A checklist, with locality and collection data, of the (Hungarian) odon. larvae in the TMB, Budapest.
- (9246) ARGIA. *The news journal of the Dragonfly Society of America*, Vol. 5, No. 2 (Sept. 1, 1993). — (c/o Dr T.W. Donnelly, 2091 Partridge Lane, Binghamton, NY 13906, USA).  
*Soltész, K.*: Dragonfly studies on the Delaware River (pp. 2-3); — *Valley, S.*: DSA meeting in Bend, Oregon (pp. 3-6); — Noteworthy records of Oregon Odonata (p. 6); — DSA Business Meeting in Bend (pp. 6-7); — *Donnelly, N.*: Northeastern group develops character in the rain (pp. 7-8); — Additional New York records of interest (p. 8); — *Daigle, J.*: Maui no ka oi (Maui is the best) or zoeie! It's Maui (pp. 8-10); notes from a trip to the Hawaii); — *Donnelly, N.*: Collecting in Alaska - or - Ninick of the North (pp. 11-12); — *Mauffray, B.*: I.O.R.I. contracted to do survey of Possum Branch drainage of Hog Town Creek, Gainesville, Florida, U.S.A.: home of the largest known *Cordulegaster sayi* population (pp. 12-13); — *Cook, C.*: Literature reviews (pp. 13-14); reviews of the volumes listed in OA 8907, 8988); — A plea for support of the U.S. Clean Water Act (pp. 14-16); — *Tennessee, K.*: The common,

- remarkable *Lydia* (pp. 16-18); — *Past and present recipients of Argia*, sorted by location, as of Aug. 1993 (pp. 19-23); — 3 commercial notices (cover p. 4). — (*Abstracter's Note*: The journal is going "from strength to strength". It is not only rapidly becoming indispensable to all serious New World workers, but much of its contents is also highly relevant for the odonatologists in general, therefore the subscriptions, at US \$ 15.- net, incl. the DSA membership fees and the surface mail postage, are warmly recommended!).
- (9247) ASAHINA, S., 1993. A revision of the genus *Rhipidolestes* from Taiwan and Japan. 3. Kyushu and Yakushima representatives. *Gekkan-Mushi* 271: 15-18. (Jap., with Engl.s. & fig. captions). — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 169, JA).  
*R. aculeatus kyushuensis* ssp.n. is described and figured from the Kyushu island (holotype not designated in the Engl. text), and *R. a. yakusimensis* Asahina, 1951, from the Yakushima island, is treated as a local form of the former. — (*Abstracter's Note*: Since the 2 subspecies-group names are synonymised, "kyushuensis" actually is a junior synonym of "yakusimensis". — For pts 1 & 2 of the series cf. *OA* 9096, 9097).
- (9248) BAILEY, R.G. & M.R. LITTERICK, 1993. The macroinvertebrate fauna of water hyacinth fringes in the Sudd swamps (river Nile, southern Sudan). *Hydrobiologia* 250: 97-103. — (First Author: Biosphere Sci. Div., King's Coll. London, Campden Hill Rd., London, W8 7AH, UK).  
 Contains an annotated list of 23 odon. spp.
- (9249) BESCHOVSKI, V.L., 1993. Critical notes on some Odonata species (Insecta, Odonata), reported by Bulgarian authors for the territories of Bulgaria, Greece and Macedonia. *Acta zool. bulg.* 46: 39-43. (With Bulg.s.). — (Inst. Zool., Bulg. Acad. Sci., Blvd Tzar Osvoboditel 1, BG-1000 Sofia).  
*Calopteryx splendens xanthostoma*, *Platycnemis hyalinata*, *Cocnagrion lunulatum*, *Nehalennia speciosa*, *Aeshna grandis*, *Onychogomphus uncatus*, *Cordulegaster boltonii* and *Somatochlora alpestris* are removed from the Bulgarian list. In consequence, the Bulgarian odon. fauna consists of 64 known spp.
- (9250) BIERWIRTH, G., 1993. Erlöschen der Zierlichen Moosjungfer *Leucorrhinia caudalis* (Charpentier, 1840) in den Altwässern des NSG Dachlleiten, Landkreis Altötting. *Mitt. zool. Ges. Braunau* 5(17/19): 381 (fig.) 383-384. — (Nikolausstr. 7a, D-84533 Markt/Inn).  
 Subsequent the introduction of Grass Carp (*Ctenopharyngodon idella*), the small population of *L. caudalis* has rapidly disappeared.
- (9251) BIERWIRTH, G., 1993. Erster Nachweis der Frühen Heidelibelle *Sympetrum fonscolombei* (Selys, 1840) im Landkreis Altötting. *Mitt. zool. Ges. Braunau* 5(17/19): 379-381. — (Nikolausstr. 7a, D-84533 Markt/Inn).  
 In the period, July 3 — Aug. 10, 1991, several *S. fonscolombei* were evidenced at Nature Reserve Dachlleiten, Altötting distr., Germany.
- (9252) BISCHOF, A., 1993. Die Libellenfauna des anthropogenen Naturreservates Monté bei Cazis, Graubünden, Schweiz (Odonata). *Opusc. zool. flumin.* 114: 1-12. (With Engl.s.). — (Hekkenweg 4, CH-7000 Chur).  
 26 spp., incl. *Ischnura pumilio*, *Sympetrum depressiusculum* and *S. pedemontanum*, are evidenced from man-made ponds at Monté nr Cazis, Grisons, Switzerland (alt. 640 m). The phenology and abundance are shown in the graphs for all spp. Of particular interest are the unusually late seasonal records of *S. striolatum* (27-XI-1991, 30-XI-1992). Although the water surface was frozen, this did not preclude the reproductive behaviour of the numerous individuals present (cf. also *OA* 8394).
- (9253) BLINN, D.W., C. RUNCK & R.W. DAVIES, 1993. The impact of prey behaviour and prey density on the foraging ecology of *Ranatra montezuma* (Heteroptera): a serological examination. *Can. J. Zool.* 71(2): 387-391. (With Fr.s.). — (First 2 Authors: Dept Biol. Sci., Northern Arizona Univ., Flagstaff, AZ 86011, USA).  
 Serological techniques were used to examine the seasonal and diel diets in the fishless, thermally constant environment of Montezuma Well, Arizona. Although alternative invertebrate prey were diverse and abundant, copepods

were the primary food of first-instar *R. montezuma*, while the endemic amphipod *Hyaella montezuma* was the preferred food of adults. Laboratory predation experiments and serological diet analyses from field collections suggest that *R. montezuma* feeds more actively at night when prey densities in Montezuma Well are elevated in the littoral vegetation. Prey behaviour is very important in the foraging ecology of *R. montezuma*. *Hyaella montezuma*, which swim in the littoral vegetation, were captured more frequently than more sedentary damselfly larvae (*Telebasis salva*). Prey-choice experiments and in situ serological diet analyses suggest that the high standing crop of *R. montezuma* is dependent upon the presence of high densities of actively swimming *H. montezuma*. — Cf. also *OA* 7350.

- (9254) BUCHWALD, R. & W. ROSKE, 1993. Das Artenhilfsprogramm für gefährdete Libellenarten in Baden-Württemberg. *Z. Ökol. NatSchut.* 2(2): 129-130. — (First Author: Inst. Biol. II/Geobotanik, Univ. Freiburg, Schänzlestr. 1, D-79104 Freiburg).

The integrated conservation program for threatened odon. spp. in Baden-Württemberg (Germany) is described.

- (9255) CALDWELL, J.P., 1993. Brazil nut fruit capsules as phytotelmata: interactions among anuran and insect larvae. *Can. J. Zool.* 71(6): 1193-1201. (With Fr.s.s). — (Dept Zool. & Oklahoma Mus. Nat. Hist., Univ. Oklahoma, Norman, OK 73019, USA).

Under experimental conditions, body size, and thus indirectly priority effects, determines the outcome of predator-prey interactions among the aquatic larvae of a small assemblage of anuran and insect spp., using a patchily distributed microcosm. The assemblage occurs naturally in fallen fruit capsules of the Brazil nut tree, *Bertholletia excelsa* (Lecythidaceae), in lowland tropical forest in Amazonian Brazil. 3 of the spp. (the tadpole of the poisonous *Dendrobates castaneoticus*, and the larvae of *Microstigma anomalum*, *Pseudostigmatidae*, and of a culicid mosquito) are predators in the system and form a guild in which all are capable of feeding mutually on smaller individuals of the other 2 spp. The larvae of the 2 insects are also cannibalistic,

although the tadpole is not. Predator-prey experiments among certain pairs of these three species revealed size-related intraguild predation. The results of these experiments and observations on naturally occurring capsules indicate that only one individual of any species per fruit capsule will survive to adulthood. Field sampled capsules revealed low densities of guild members, with few co-occurrences among them. Whether this is due to the timing of the study in the early part of the rainy season or some other factor limiting accessibility to the fruit capsules is unknown. Although priority effects are well known among assemblages of competitors, this study reveals that potentially they can significantly affect predator-structured systems. The larva of a fourth species in the assemblage, a small bufonid toad, is detritivorous and palatable to the three predaceous species. In the presence of one of the three predaceous species, survival of the bufonid larvae depends on a rapid time to metamorphosis and on saturation of the microcosm with enough individuals in a clutch that some will survive to metamorphosis.

- (9256) CARIUS, W., 1993. *Zur Verwendbarkeit biochemischer Daten in der Verwandtschaftsanalyse von Insekten. Elektrophoretische Untersuchungen an Archeocarabus (Bengtsson, 1927) (Carabus, Carabidae, Coleoptera) und der Gattung Aeschna Fabricius, 1775 (Aeshnidae, Odonata)*. Diss. Univ. Bremen. x+152 pp. — (Schwarzer Berg Weg 9, D-27243 Harpstedt).

The alloenzyme gel electrophoresis of 15 European spp., pertaining to the genera *Aeshna* (9), *Anaciaeschna* (1), *Anax* (2), *Boyeria* (1), *Brachytron* (1) and *Hemianax* (1), yielded 7 scorable loci. The genetic distances indicate *Boyeria* is close to *Aeshna*, while the affinities within *Aeshna* are largely identic to those postulated by Peters (*OA* 6147). It is suggested, the electrophoretic research could represent a useful approach in the Postpleistocene biogeography.

- (9257) CLIFFORD, H.F., G.M. WILEY & R.J. CASEY, 1993. Macroinvertebrates of a beaver-altered boreal stream of Alberta, Canada, with special reference to the fauna on the dams. *Can. J. Zool.* 71(7): 1439-1447. (With Fr.s.s). — (First Author: Dept Zool., Univ. Alberta, Edmonton, AL, T6G 2E9, CA).

There were different macroinvertebrate assemblages on the face of and in beaver dams compared with beaver ponds and main streams sites. The beaver dam featured a large proportion of simuliid larvae compared with the main stream sites of this stream and with areas of other studies of beaver-altered streams. The fauna of the dams was typical of fast-flowing habitats, whereas animals of the main stream sites (including the beaver ponds) were more characteristic of slow-flowing or lentic habitats. Cluster analysis separated the dam and main stream sites for each sampling date and study yr, based on the composition of the macroinvertebrates. Although the invertebrate assemblages of the dams differed from those of the main stream sites, both habitats included similar functional feeding groups, except for a shredder found only at the dams. There are similarities between the beaver dam fauna and the faunas of debris dams, woody snags, and lake outlets. Beaver dams are important in supporting large populations of simuliids and generally in maintaining a lotic fauna in slow-moving, low-gradient boreal streams. Even so, the odon. are hardly considered, listed solely as "Anisoptera", occurring at both the dam and main stream sites.

- (9258) DAVID, S., 1993. Ohrozené a vzácné druhy vážek (Insecta: Odonata) Slovenské republiky. – Threatened and rare species of dragonflies (Insecta: Odonata) in the Slovak Republic. *Biologia, Bratislava* 48(2): 177-182. (Slovak, with Engl.s.). – (Tekovské Muz., P.O. Box 69, SLK-93469 Levice).  
A commented checklist is presented of the 69 hitherto from Slovakia known spp. 47 of these are listed, under various categories, in the Red List.
- (9259) DOMMANGET, J.-L., 1993. Programme INVOD: bilan et perspectives. In: J. Lhonore, H. Maurin, R. Guilbot & P. Keith, [Eds], Inventaire et cartographie des invertébrés comme contribution à la gestion des milieux naturels français, pp.77-82, Mus. Natn. Hist. Nat., Paris. – (7 rue Lamartine, F-78390 Bois-d'Arcy).  
The preliminary results of the odon. mapping in France (the INVOD Program, since 1982) are presented and discussed. So far 50.000 records and 1500 bibliographic references were

analysed.

- (9260) DUHR, A., 1993. Weitere Neufunde der Kleinen Zanglibelle – *Onychogomphus forcipatus* – an Our, Sauer, Nims und Prüm. *Dendrocopos* 20: 114-116. – (Altenhof 1, D-54636 Oberweis).  
With reference to the paper listed in OA 5807, several new records (with brief habitat descriptions) are stated for the Trier distr. (Germany) and Luxembourg.
- (9261) DUNHAM, M., 1993. Changes in mass, fat content, and water content with growth in adult *Pachydiplax longipennis* (Odonata: Libellulidae). *Can. J. Zool.* 71(7): 1470-1474. (With Fr.s.). – (Dept Ent., S-225 Agric. Sci. Bldg, North, Univ. Kentucky, Lexington, KY 40546, USA).  
Data on mass gain of individual adults as they matured in a large enclosure are presented and compared with those of individuals captured as tenerals, immatures or mature adults. Males gained more mass than females. Mortality did not differ between the sexes, or between light and heavy individuals in the enclosure.
- (9262) EISENREICH, W., D. EISENREICH, U.E. ZIMMER & A. HANDEL, 1993. *Rastline in živali okrog nas*. DZS, Ljubljana. ii+400 pp. inlay 32 pp. excl. – ISBN 86-341-0827-9. – Slovene ed. of "Tier- und Pflanzenführer für Unterwegs" (BLV, München, 1990), translated by D. Soban (bot.) and A. Gogala (zool.). – Price in Slovenia: SIT 2868.- net.  
Contains 7 odon. spp. (pp. 226-231), for which Slovene vernacular names are also stated.
- (9263) EISLÖFFEL, F., M. NIEHUIS & M. WEITZEL, 1993. *Rote Liste der bestandsgefährdeten Libellen (Odonata) in Rheinland-Pfalz. (Zweite, neu bearbeitete Fassung, Stand: Juli 1992)*. Ministerium für Umwelt, Mainz. iv+28 pp. – (Publisher: Kaiser-Friedrich-Str. 7, D(W)-6500 Mainz).  
A revised and updated ed. of the Red List listed in OA 4981.
- (9264) ESCHER, R.L. & L.P. LOUNIBOS, 1993. Insect associates of *Pistia stratiotes* (Arales: Araceae) in southeastern Florida. *Fla Ent.* 76(3):

473-500. — (Fla Med. Ent. Lab., Univ. Florida, 200 9th St SE, Vero Beach, FL 32962, USA). Emergence traps and plant quadrat samples were used to survey insects associated with the Water Lettuce monoculture in an abandoned aquaculture pond and a roadside drainage ditch in St Lucie Co. Among more than 300 spp. identified, 7 odon. spp. are listed.

- (9265) *FIELD TRIP HANDBOOK [of] the Twelfth International Symposium of Odonatology, Osaka, Japan, 1993*. Edited by K. Inoue. Issued by the Societas Internationalis Odonatologica (S.I.O.), Osaka, Japan. ii+22 pp., map incl. — (c/o SIO Central Office, P.O. Box 256, NL-3720 AG Bilt-hoven).

Introduction (p. 1); — Mid-Symposium Trip (pp. 2-6); "Dragonfly Paradise" at Hirakata City, Kawakami-daira Marsh in Shiga pref.; Hosaka area; Lake Biwa; Kyoto); — Alternative Trip (pp. 7-8; Kyoto sight-seeing); — Post-Symposium Tour (pp. 9-12; Oshibuchi in Mie pref.; Mikimoto Pearl Island); — "Dragonfly-Kingdom" Tour (pp. 13-17; Nakamura); — List of species to be observed at the trip and tours (pp. 18-20); — Appendix (p. 21).

- (9266) FOIDL, J., R. BUCHWALD, A. HEITZ & S. HEITZ, 1993. Untersuchungen zum Larvenbiotop von *Gomphus vulgatissimus* Linné 1758 (Gemeine Keiljungfer; Gomphidae, Odonata). *Mitt. bad. Landesver. Naturk. NatSchutz*: (N.F.) 15(3/4): 637-660. (With Engl.s.). — (Second Author: Inst. Biol. II/Geobotanik, Univ. Freiburg, Schänzlestr. 1, D-79104 Freiburg).

4 *G. vulgatissimus* breeding sites in the Upper Rhine Valley, Germany, were studied (1989), and the larval habitats and habits are characterized. The waters chosen differ widely in several factors, each one representing a special type of water: a meadow brook, a small tributary river, a river plain back-water, and an excavation pond with strong wave activity on its banks. The larvae live on the bottom of the water, where they show a clear preference for a sandy-muddy bottom. Tubificids as well as the larvae of Ephemera and Chironomids are the preferred prey. The larvae search actively for food in the darkness within the sediment. Hence the regularly observed appearance at the surface of the substratum does probably not serve primarily in

the search for food. The larvae are rheophilous, but also the surf area of an excavation pond with its streaming flow offers good conditions for them. They do not require a high standard of water quality or any natural flowing of the water. Although they are rheophilous, the remarkably flat body is interpreted less as an adaptation to strong current than to their burrowing activity in the substratum. Once out of the sediment, the larvae are sensitive to higher velocities of flow and try to avoid them. Their preference for muddy sediment as well as the specialized body structure give them a surprisingly high mobility in mud — a great advantage especially when searching for prey.

- (9267) GÄDE, G., 1993. Structure-activity relationships for the lipid-mobilizing action of further bioanalogues of the adipokinetic hormone / red pigment-concentrating hormone family of peptides. *J. Insect Physiol.* 39(5): 375-383. — (Zool. Dept, Univ. Cape Town, Rondebosch-7700, SA).

The relative potencies, with respect to mobilization of lipids in *Locusta migratoria*, of nine synthetic bioanalogues (naturally-occurring members of the adipokinetic hormone/red pigment-concentrating hormone family of peptides) and of one synthetic analogue have been assessed by measuring complete dose-response curves; a clear indication of comparable transport and degradation rates. From the dose-response curves of the bioanalogues tested in this study four distinct activity groups with respect to potencies and/or maximal activities can be distinguished. Three octapeptides, the hypertrehalosaemic peptide from *Tenebrio molitor* and the adipokinetic peptides from *Empusa pennata* and *Libellula auripennis*, which have replacements at positions 5, 2, and 2 and 7, respectively, compared to locust adipokinetic hormone I, have 4-7 fold higher ED<sub>50</sub> values. — Cf. also OA 7635.

- (9268) *GOMPHUS. Mededelingsblad van de belgische libellenonderzoekers — Bulletin de liaison des odonatologues belges*, Vol. 9, No. 2 (July, 1993). — (c/o Ms A. Anselin, KBIN, 29 rue Vautier, B-1040 Bruxelles).

Save for a few announcements, the whole issue

is devoted to the report on the 1992 odon. inventarisation in Flandres, Belgium (A. Anselin, pp. 30-52; Dutch, with Fr.s.), with distribution maps of 46 spp.

- (9269) GORB, S.N. & R.S. PAVLYUK, 1993. Periody leta strekoz v central'nyh i zapadnyh oblastyah Ukrainy. — Dragonfly flight periods in western and central Ukraine. *Vest. Zool., Kiev* 1993 (3): 50-59. (Russ., with Ukr. & Engl.s's). — (First Author: Lab. Insect Physiol., Schmalhausen Inst. Zool., Ukrain. Acad. Sci., B. Chmelnic-kogo Str. 15, UKR-252601 Kiev).

The phenology data for 61 spp., gathered from the literature, collection labels and from the original field observations, are presented and analysed.

- (9270) GRIMALDI, D., 1993. [Book review]. F.M. Carpenter, *Treatise on invertebrate paleontology* [etc.]. *Annl. ent. Soc. Am.* 86(5): 674-675. — (Dept Ent., Am. Mus. Nat. Hist., Central Park West, at 79th St., New York, NY 10024, USA).

A comprehensive review of the vol. listed in OA 8942, by Assistant Curator of the Dept. one of the Author's former students.

- (9271) HAGENIA. *Mitteilungsblatt des Nationalen Büros der SIO in der Bundesrepublik Deutschland und der GdO*, No. 6 (Sept. 1, 1993). Edited by M. Schorr & U. Krüner. — (Subscription orders outside Germany to the SIO Central Office, Bithoven).

The issue contains over 40, mostly signed, notes, announcements, etc., therefore only a few can be mentioned here. — *Rudolph, R.*: In memoriam Janny van Brink (p. 1); — *S[chorr], M.*: Dr. B.F. Belyshev (13.12.1910-19.04.1993) (p. 1); — *Kotarac, M.*: 1. Libellenkundliches Symposium der "Alps-Adriatic Regional Community" in Maribor, Slovenien (pp. 1-2); — *Gerken, B.*: Protokoll der Mitgliederversammlung der [...] GdO (p. 2); — *Gorb, S.*: Odonatologische Reisen in die Ukraine und nach Russland (p. 4); — *Laister, G.*: Gesucht: Libellensammlung von Chr. Brittinger (p. 4); — *Aktivitäten* (pp. 5-7); — *Jürging, M.*: Dokumentation zu den odonatologischen Aktivitäten von Hennig Schumann, Hannover (pp. 7-8); — *Literatur* (pp. 8-10); — *Bestellen und Kaufen*

(pp. 10-11); — *Verschiedenes* (pp. 12-13); — *Redaktionelles* (p. 13); — *GdO Kassenbericht 1992* (p. 15).

- (9272) HARVEY, I.F. & K.J. WALSH, 1993. Fluctuating asymmetry and lifetime mating success are correlated in males of the damselfly *Coenagrion puella* (Odonata: Coenagrionidae). *Ecol. Ent.* 18(3): 198-202. — (Pop. Biol. Res. Gr., Dept Environ. & Evol. Biol., Univ. Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK).

Fluctuating asymmetry (FA) may be an important cue that ♀♀ use when choosing their mates because it is likely to be an indicator of genetic quality. FA represents a measure of developmental stability, which is in turn an indicator of how good the genome is at controlling the processes of normal development to produce a perfectly symmetrical organism. Both environmental stress and genomic stress may disrupt development and produce asymmetrical structures. Genomic stress may occur when, for example, a new mutation is being incorporated into the gene pool, and the degree of co-adaptation of the genome is upset. An organism with a co-adapted genotype and with genes that enable it to resist environmental stresses will develop symmetrically. It is expected, therefore, that a high degree of symmetry is associated with high fitness. — In *C. puella*, FA was measured as the difference in length of left and right fore and hind wings. ♂♂ with more symmetrical wings enjoyed higher lifetime mating success. Larger ♂♂, in contrast to a previous study of this sp., also had higher mating success. This may be attributed to differences in the weather conditions prevailing at the time of the studies.

- (9273) HEIDEMANN, H. & R. SEIDENBUSCH, 1993. *Die Libellenlarven Deutschlands und Frankreichs. Handbuch für Exuviensammler*. Bauer, Kellern. 392 pp., 2 pp. inlay "Nachträge und Berichtigungen". — ISBN 3-9801381-4-3. — Available from the SIO, at Hfl. 70.- approx.

After the pioneer works of G. Carchini (cf. OA 4025, 4291), this is the third and the largest volume on the European odon. larvae. It covers central Europe and the continental France, providing keys, detailed morphological descriptions, information on biology and distribution,

and hints for the collecting of all regional spp. Practically all figs of structural features are original and they are organised into close to 100 pls. Although well balanced, the emphasis is given to the hitherto somewhat "neglected" Zygoptera. — In spite of some minor, partly inevitable shortcomings, the book will be absolutely indispensable to the ever increasing community of odon. students in Europe.

- (9274) HERLJEVIĆ, P. & M. FRANKOVIĆ, 1993. Fauna vretenaca (Insecta: Odonata) Gorskog kotara s posebnim osvrtom na istraženost vretenaca u Nacionalnom parku "Risnjak". — [Dragonfly fauna (Insecta: Odonata) of Gorski Kotar, with particular reference to the status of dragonfly exploration in the Risnjak National Park]. *Sažeci Izlag. Savjet. 40-god. Osnutka Rada nac. Parka "Risnjak", Crni Lug*, p. 18 [abstract only]. (Croat.). — (Second Author: Dept Anim. Physiol., Fac. Sci., Univ. Zagreb, Rooseveltov trg 6, P.O. Box 933, CRO-41001 Zagreb, Croatia).  
12 spp., evidenced from 4 localities in the Gorski Kotar area, NW Croatia, are listed. Not a single dragonfly has been so far recorded from the Risnjak National Park.
- (9275) HEYMER, A., 1993. *Platycnemis pennipes* (Pall.) en Espagne (Odon., Zygopt.). Oficina ibérica de la SIO, Córdoba. 3 pp. — (Orders to: Oficina ibérica de la Sociedad internacional de Odonatología, S.I.O., c/o Dr M. Ferreras Romero, Depto Biol. Animal/Zool., Fac. Cien., Univ. Córdoba. Avda. San Alberto Magno s/n, ES-14004 Córdoba).  
A bilingual (German/Spanish) ed. of the German work, published originally (1961) in *Vie Milieu* 11(4): 686-687.
- (9276) HOGUE, C.L., 1993. *Latin American insects and entomology*. Univ. Calif. Press, Berkeley-Los Angeles-Oxford. xiv+536 pp., 4 col. pls excl. — ISBN 0-520-07849-7 (cloth). — Price: £ 60.- net.  
The work provides an introduction to the common insects of Latin America and a foundation for their study. Of general interest is the chapter on the "History of Latin American entomology" (pp. 3-13). The odon. are dealt with on pp. 196-200. Useful is the listing of a number of Spanish and Portuguese vernacular appellations for the Order and Suborders, as used specifically in various Latin American countries.
- (9277) JASCHKE, K., 1993. Die Vögel des Naturschutzgebietes "Dünstekovener Teiche" — mit Angaben über weitere Tier- und Pflanzenarten. *Charadrius* 29(2): 57-63. (With Engl.s.). — (Julius-Plücker-Str. 17, D(W)-5300 Bonn-1).  
*Sympetma fusca*, *Ischnura pumilio*, and *Gomphus pulchellus* are listed from the locality, Rhein-Sieg distr., Northrhineland-Westfalia, Germany.
- (9278) JODICKE, R., 1993. Die Bestimmung der Exuvien von *Sympetrum sanguineum* (Müll.), *S. striolatum* (Charp.) und *S. vulgatum* (L.) (Odonata: Libellulidae). *Opusc. zool. flumin.* 115: 1-8. (With Engl.s.). — (Grossenging 14, D-49699 Lindern).  
2 traits of the abdominal tip in ventral view are analysed in regard to the structure of the hind rim of sternite 7 and the relative length of the lateral spines. A comb-like row of short setae along the hind rim is present in *S. sanguineum* and *S. striolatum*, but it is lacking in *S. vulgatum*. *S. sanguineum* has shorter lateral spines than *S. striolatum*. *S. nigrescens* Lucas cannot be separated from *S. striolatum* by means of these characters.
- (9279) JOHANSSON, F., 1993. Intraguild predation and cannibalism in odonate larvae: effects of foraging behaviour and zooplankton availability. *Oikos* 66: 80-87. — (Dept Anim. Ecol., Univ. Umeå, S-90187 Umeå).  
For the abstract cf. OA 8560.
- (9280) JOHNSON, R.K., T. WIEDERHOLM & L. ERIKSSON, 1993. Classification of littoral macroinvertebrate communities of Swedish reference lakes. *Verh. int. Ver. Limnol.* 25(1): 512-517. — (Cent. Environ. Monit., Swed. Univ. Agric. Sci., Box 7050, S-75007 Uppsala).  
The communities were classified by season, by mean annual densities, and by sampling procedure, but only the results from TWISPAN and CCA analyses of mean annual densities are included here. *Cordulia aenea* was often found occurring in pH-stressed lakes and was negatively aligned along the pH gradient.



- (9281) *JOURNAL OF THE BRITISH DRAGONFLY SOCIETY*, Vol. 9, No. 2 (Oct., 1993). — (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).  
*Corbet, P.*: The first ten years of the British Dragonfly Society (pp. 25-39); — *Cham, S.*: Further observations on generation time and maturation of *Ischnura pumilio* with notes on the use of a mark-recapture programme (pp. 40-46); — *Silsby, J.*: A review of *Hemianax ephippiger*, the Vagrant Emperor (pp. 47-50); — *Paine, A.*: Brief notes and observations (pp. 51-52).
- (9282) JUNCK, C., F. SCHOOS & R. SCHOOS, 1993. Faunistische Untersuchungen im geplanten Naturschutzgebiet "Mierscherdall". *Bull. Soc. Nat. luxemb.* 94: 33-85. (With Engl.s.). — (First Author: 5 Béiwenerweem, L-7418 Buschdorf). 9 odon. spp. are listed from this locality in Luxembourg.
- (9283) JURZITZA, G., 1993. *Contribución al conocimiento de la fauna de odonatos de España Noroeste, con noticias a la cuestión de razas de Agrion haemorrhoidalis (Van der Linden)*. Oficina ibérica de la SIO, Córdoba. 12 pp. — (Orders to: Oficina ibérica de la Sociedad internacional de Odonatología, S.I.O., c/o Dr M. Ferreras Romero, Depto Biol. Animal/Zool., Fac. Cien., Univ. Córdoba, Avda. San Alberto Magno s/n, ES-14004 Córdoba). A bilingual (German/Spanish) ed. of the German work, published originally (1965) in *Beitr. naturk. Forsch. SW-Dtl.* 24(2): 183-187.
- (9284) KALKMAN, V. & A. STROO, 1993. *Handeling voor het Libellenproject*. JNM & NJN, 's-Gravenland-Utrecht. 16 pp. (Dutch). — (c/o Ned. Jeugdbond v. Natuurstud., Schaep en Burgh, Noordereinde 60, NL-1243 JJ 's-Gravenland). Instruction booklet for the project described in OA 8752.
- (9285) KANO, K., F. KOBAYASHI & H. KITA, 1993. [Some observations on adult behaviour of *Aeshna mixta* Latr. in Nagano pref., Honshu, Japan]. *Gekkan-Mushi* 267: 21-23. (Jap.). — (First Author: 5-19-17-601 Koishikawa, Bunkyo-ku, Tokyo, 112, JA). Observations on territorial and sexual behaviour were carried out at a pond in the Suwa City area (Sept.-Oct., 1990-1992). The occurrence of ♀ polychromatism in body coloration is also reported.
- (9286) KÄUFLE, P., 1993. Wenn der Jäger zum Opfer wird. *Fotografie draussen* 24(7): 23. — (Author's address not stated). A good circumstantial description of a *Cordulegaster boltonii* victimised by an araneid spider, with a photograph.
- (9287) KAUFMANN-BÜCHELER, G., 1993. *Feldökologische Untersuchungen der Libellenfauna an Torfstichgewässern im Wurzacher Ried (Landkreis Ravensburg/Oberschwaben)*. Dipl.-Arb. Univ. Höhenheim. vi+75 pp. — (Gartenstr. 11, D-88427 Bad Schussenried). In order to ascertain the effect of the naturalization measures, as outlined in the paper listed in OA 7931, the composition and status of the odon. fauna were studied during one season in one of the peat-digging complexes. The current faunal composition, habitat preferences and the local ecology of each sp. are described in great detail. — Cf. also OA 9230.
- (9288) KHALIQ, A. & M. YOUSUF, 1993. Coenagrionidae (Zygoptera: Odonata) of Pakistan. 2. Subfamily Pseudagrioninae. *Pakistan J. Zool.* 25(2): 159-164. — (First Author: Dept Ent., Univ. Coll. Agric., Rawalakot, Azad Kashmir, Pakistan). The 2 Pakistani genera, *Pseudagrion* (2 spp.) and *Ceragrion* (5 spp.), are keyed, the spp. are described in detail, and all known records are listed. *P. hypermelas* is for the first time recorded from Pakistan. — For pt 1 cf. OA 8955.
- (9289) KIAUTA-BRINK, M., 1993. *Tule voor de berberis: haiku, senryu, tanka*. — [Veil for the barberry: haiku, senryu, tanka]. Ursus, Bilthoven. 82 pp. — ISBN 90-73527-02-3. — Price: Hfl. 20.- net. (Dutch). — (Publishers: Ursus, P.O. Box 256, NL-3720 AG Bilthoven). This is a collection of 63 haiku, senryu and tanka poems (incl. a dragonfly text) by Marianne Kiauta, some of which were published earlier in various Dutch and foreign literary periodicals, poetry anthologies, etc. Some of them (either in Dutch, or in Engl., Japanese and/or

German versions) have received various literary awards and prizes, e.g. Roger-Wastijn Haiku Award (1990, Hulshout, Belgium). – International Haiku Contest Anthology (1990, 5th National Cultural Festival, Matsuyama, Ehime pref., Japan), – Haikoe-kern (1990, 1993, Antwerp, Belgium), – Concept (1992, Brugge, Belgium & Hilversum, The Netherlands), – Mirrors International Tanka Award (1992, AHA Books, Gualala, CA, USA), – Garden Festival Wales (1992, Ebbw Vale, United Kingdom), etc.

- (9290) *KIMMINSIA. Newsletter of the United Kingdom National Office of the International Odonatological Society (SIO)*, Vol. 4, No. 2 (Nov. 1, 1993). – (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).

12 members are reporting in the traditional sections, "News from members" (pp. 9-10), "Conservation news" (p. 10), and "News from the universities" (pp. 10-11). The signed articles are: *Endersby, I.*: More sites for Hemiphlebia (pp. 11-12); – *Silsby, J.*: XII International Dragonfly Symposium, Osaka, Japan (pp. 12-13); – *Corbet, P.*: International Symposium on the Conservation of Dragonflies and their Habitats (pp. 13-14); – *Butler, S.*: Larval collecting in Japan, 1993 (p. 14); – *Corbet, P.*: Odonatology in Algeria (2) (pp. 14-15); – *Kemp, B.*: Some observations from the island of Rhodes in April 1993 (pp. 15-16); – *Vick, G.*: A visit to Malaysia in July 1993 (pp. 16-17); – *Davies, A.*: Previews (p. 18; "rediscovery" of *Chlorogomphus papilio* "somewhere close to the borders of Vietnam, Laos, Siam, Burma and China"). – On p. 12, there is an extract of a newspaper article, "Dragonfly swarm attacks China ship", published in *The Philippine Star* of Sept. 22, 1993. – Various requests and offers from the membership conclude the issue (p. 18).

- (9291) *KOTARAC, M.*, 1993. *Kačji pastirji. Gradivo za pedagoško delavnico*. – [*Dragonflies. Materials for a pedagogical workshop*]. Zavod Republike Slovenije za šolstvo in šport, Maribor. 16 pp. (Slovene). – (Marhovich 11, SLO-62000 Maribor, Slovenia).

This is an illustrated hand-out booklet, prepared by the President of the Slovene Odonatol. Society (= SIO National Section for Slovenia) for a high school biology teachers "refreshing"

course (Maribor, Slovenia, Nov. 5, 1993; 48 participants). The course was organised by the Slovene Department of Education & Sports, and conducted by the Author, who is the leading odon. authority in Slovenia. (For a similar course in Switzerland cf. OA 8750). – Chapter titles: "Larval morphology", "Adult morphology", "Biology", "Ecology", "Behaviour", "Status of faunal exploration in Slovenia", "Threat and conservation", "Application of dragonflies in the teaching process", "Suggestions for further reading". The text on odon. morphology is enhanced by 4 pls (42 figs), presenting the main structural features of the 2 main suborders. A copy of the registration blank, designed by the Author in 1992 for the Slovene Odon. Mapping Scheme, is appended. – Scope and emphases of the 1-day workshop are apparent from the Agenda, which also appears in the booklet, viz. "Technical presentation of dragonflies by means of slides and specimens" (1 h), "Behaviour, feeding and life cycle" (0.5 h), "Identification of larvae, exuviae and imagines" (2 h), "Suggestions for work with students/ Suggestions and instructions for the preparation of student research projects" (1.5 h).

- (9292) *KRAČUN, D.*, 1992. Uredba o zavarovanju ogroženih živalskih vrst. – [Regulation on the protection of threatened animal species]. *Uradni List Republike Slovenije* 3(57): 2851-2854. (Slovene).

This is the official text of the Regulation [not an Act!], issued by the Government of Slovenia, and operative since Oct. 15, 1993. It covers all the odon. spp., the collecting (etc.) of which in Slovenia is herewith forbidden. – (*Abstracter's Note*: The Regulation is signed by the Vice Premier of the Slovenian Government, and has been prepared by J. Vidic of the Institute for the Conservation of Natural and Cultural Heritage of Slovenia, Ljubljana. As far as the odon. are concerned, no odonatologist has been consulted. Since the odon. fauna of Slovenia is inadequately explored, no Red List is available at this stage. Needless to say, any kind of indiscriminate "total protection" of all odon. spp. would only be contraproductive, would make every interference with almost any aquatic habitat "illegal", and would contribute nothing to the actual conservation of de facto threatened

habitats of the "nationally important" odon. taxa. Consequently, the leadership of the SIO Section in Slovenia had an interview with the said governmental Institute on Oct. 19, 1993, submitted a balanced list of 13 spp. (incl. their status in Slovenia according to the IUCN categories) the protection of which would cover most of the important types of aquatic habitats in Slovenia (*Erythromma viridulum*, *Ceriagrion tenellum*, *Aeshna juncea*, *Gomphus vulgatissimus*, *Stylurus flavipes*, *Ophiogomphus cecilia*, *Lindenia tetraphylla*, *Cordulegaster heros*, *Somatochlora alpestris*, *S. arctica*, *Sympetrum pedemontanum*, *Leucorrhinia caudalis*, *L. pectoralis*), and has received the assurance the Regulation will be modified in this spirit within the next few months. It should be emphasized that, save for *L. tetraphylla* (known from a single record) and *C. tenellum* (restricted to a few localities in Istria), no odon. sp. is for the time being actually threatened in Slovenia. A detailed mapping of the fauna has commenced in 1992).

- (9293) KURSTJENS, G., 1993. [Koningssteen:] De Libellenfauna. — The dragonflies of Koningssteen. *Natuurh. Maandbl.* 82(10): 243-244. (Dutch, with Engl.s.). — (Stichting Ark, P.O. Box 3575, NL-6017 ZH Thorn).  
11 spp. are listed from floodplain of Koningssteen (Meuse R., the Netherlands). A beneficial impact of cattle grazing on the odon. community is tentatively suggested and briefly discussed.
- (9294) LEGRAND, J., 1993. Sur l'identité des genres *Microgomphus* Sélys et *Africogomphus* Fraser (Odonata, Anisoptera, Gomphidae). *Revue fr. Ent.* (N.S.) 15(3): 107-108. (With Engl.s.). — (Lab. Ent., Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris).  
*Africogomphus* Fraser, 1936 is a synonym of *Microgomphus* Sélys, 1857.
- (9295) LEHMANN, G., 1993. Libellen am Nordalpenrand. — Zur Erforschung und Verbreitung einer ausgewählten Insektengruppe dies- und jenseits der bayerisch-tirolischen Grenze. In: M. Pizzini, [Ed.], Beitragsband zur Tiroler Landesausstellung bayerisch-tirolische G'schichten, pp. 228-236, Tiroler Landesmus. Ferdinandeam, Kufstein. — (Kleinholzweg 25, A-6330 Kuf-

stein).

- An annotated checklist is given of the 73 spp. recorded so far from the Alpine foreland on both sides of the Bavaria (Germany)/Tyrol (Austria) border. The history of odonatol. exploration in this area is outlined (with comprehensive biographies of F. Prenn, 1878-1964, and A. Bilek, 1909-1974), and vertical distribution of the regional taxa is stated.
- (9296) LENZ, L., 1993. Besucher am Gartenteich: Libellen, die fliegende Edelsteine. *Grosse Haustier Mag.* 1993(3): 4-8. — (Im Brühl 6, D(W)-5590 Cochem-Sehl).  
A brief description of the preparation of a dragonfly garden pond, and an account of the fauna expected to be encountered in such ponds in Germany. The reference to *Crocothemis erythraea* is unusual.
- (9297) LIBELLULA. *Mitteilungsblatt der Gesellschaft deutschsprachiger Odonatologen (GdO)*, Vol. 12, No. 1/2 (Nov. 1993). — (c/o Mrs U. Krüner, Gelderner Str. 39, D-41189 Mönchengladbach).  
*Hölzinger, W.E. & H. Brunner*: Zur Libellenfauna einer Kiesgrube südlich von Graz (Steiermark, Österreich) (pp. 1-9); — *Chovanec, A.*: Beitrag zur Emergenz von *Ischnura elegans* (Vander Linden) (Odonata: Coenagrionidae) (pp. 11-18); — *Wildermuth, H. & E. Knapp*: *Somatochlora metallica* (Vander Linden) in den Schweizer Alpen: Beobachtungen zur Emergenz und zur Habitatpräferenz (pp. 19-38); — *Busse, R.*: Libellen von der türkischen Südküste (pp. 39-46); — *Fliedner, H.*: *Erythromma viridulum* (Charpentier) erstmals für Bremen nachgewiesen (Zygoptera: Coenagrionidae) (pp. 47-61); — *Mauersberger, R. & D. Heinrich*: Zur Habitatpräferenz von *Leucorrhinia caudalis* (Charpentier) (Anisoptera: Libellulidae) (pp. 63-82); — *Burkart, W.*: Ungewöhnlicher Fundort und Eiablageplatz von *Erythromma viridulum* (Charpentier) (Zygoptera: Coenagrionidae) (pp. 83-85); — *Döler, H.-P.*: Schutz- und Pflegemaßnahmen für Moorlibellengewässer auf der Nordostalpb (pp. 87-90).
- (9298) LODZIG, R., 1993. Sieben Paare der Gemeinen Federlibelle bei der Eiablage (Masuren/Polen). *Fotografie draussen* 24(7): cover phot. — (Author's address unknown).

- Platycnemis pennipes; Masuria, Poland: phot. of 7 ovipositing tandems.
- (9299) MALANGPO. *Newsletter of the Thai National Office of the International Odonatological Society (S.I.O.)*, No. 10 (Nov., 1992). Edited by Bro A. Pinratana. — (St Gabriel's Coll., 565 Samsen Rd, Bangkok-10300, Thailand; — Subscriptions outside Thailand: SIO Central Office, P.O. Box 256, NL-3720 AG Bilthoven).  
 Pinratana, A.: Report of the S.I.O. in Thailand (p. 65); — XII International Symposium, Osaka, Japan, August 1-11, 1993 (p. 66); — Michalski, J.: Return to Thailand with Brother Amnuay Pinratana, January 2-22, 1993 (pp. 67-72); — Donnelly, T.: Thailand 1993 collecting (pp. 67-73); — Dunkle, S.W.: A Texan in Thailand (pp. 74-76).
- (9300) MALMQVIST, B., A.N. NILSSON, M. BAEZ, P.D. ARMITAGE & J. BLACKBURN, 1993. Stream macroinvertebrate communities in the island of Tenerife. *Arch. Hydrobiol.* 128(2): 209-235. — (First Author: Dept Anim. Ecol., Univ. Umeå, S-90187 Umeå).  
 Tenerife is the largest and highest of the Canary Islands, situated some 300 km off the coast of Morocco. The paper lists 6 odon. spp. — For a commercial book on the Canary Isls odon. cf. OA 5370; for a Tenerife field guide (incl. odon.) cf. OA 8055.
- (9301) MANNING PROVINCIAL PARK, [Pubs], 1993. *Can you find these animals and plants?* Stencil, 4 pp. — (c/o Zone Manager, Manning Prov. Park, Manning Park, B.C., V0X 1R0, CA).  
 A pictorial "questionnaire" to trigger the visitors' interest in the local fauna. Among the taxa shown are also a larval and an adult Enallagma sp. and Aeshna sp.; British Colombia, Canada.
- (9302) MARTINIA. *Bulletin des odonatologues de France*. Vol. 9, No. 3 (Sept. 1993). — (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois-d'Arcy).  
 Coppa, G.: Nouvelles observations de Cordulegaster bidentata Sélvs, 1843 dans le département des Ardennes (Odonata, Anisoptera, Cordulegasteridae) (pp. 53-55); — Dommanget, J.-L.: In memoriam Janny Margaretha Van Brink, 1923-1993 (p. 56); — Grand, D.: Sur quelques odonates observés dans le département du Morbihan (pp. 57-61); — J.-L.D[ommanget]: Inventaire cartographique des odonates de France: programme INVOD (p. 62); — Deliry, C. & K. Funkiewicz: Nouvelles observations d'odonates dans le département des Hautes-Alpes (pp. 63-66); — Deliry, C.: Odonates de la Crau (Bouches-du-Rhône) (p. 67); — Rubrique bibliographique (pp. 69-76); contains 9 abstracts and a very comprehensive review-cum-author's-corrections of the volume listed in OA 9136).
- (9303) MELIC, A., 1993. Protección legal de artrópodos en España. *Boln Soc. ent. aragon.* 1993(3): 9-16. — (Soc. Ent. Aragonesa, Apdo postal 3083, ES-50080 Zaragoza).  
 16 odon. spp. are protected in Europe by international legislation. Out of these, probably 7 spp. also occur in Spain, but there is no national legislation re the Spanish odon. fauna.
- (9304) MERMOND-FRICKER, F., 1993. Bibliographie concernant la faune entomologique suisse, 1991. *Bull. romand Ent.* 11(2): 113-127. — (Centre suisse Cartogr. Faune, Terreaux 14, CH-2000 Neuchâtel).  
 Contains 9 odonatol. titles.
- (9305) MEŠKO, B., 1993. Zavarovanje živalskih vrst. — [Conservation of animal species]. *Republika, Ljubljana* 2(284): 8 (issue of Oct. 17). (Slovene).  
 A comprehensive article in a national daily, triggered by the "Regulation" as listed in OA 9292.
- (9306) MEYER, E.P. & T. LABHART, 1993. Morphological specializations of dorsal rim ommatidia in the compound eye of dragonflies and damselflies (Odonata). *Cell Tissue Res.* 272(1): 17-22. — (Zool. Inst., Univ. Zürich, Winterthurerstr. 190, CH-8057 Zürich).  
 The fine structure of dorsal rim ommatidia in the compound eye of *Ischnura elegans*, *Aeshna cyanea* and *Sympetrum striolatum* exhibits several specializations, viz. (1) the rhabdoms are very short, (2) there is no rhabdomeric twist, and (3) the rhabdoms contain only two, orthogonally-arranged microvillar orientations. The dorsal rim ommatidia of several other insect sp. are known to be anatomically specialized in a similar way and to be responsible for polariza-

tion vision. It is suggested that the dorsal rim area of the odon. compound eye plays a similar role in polarization vision. Since the Odon. are a primitive group, the use of polarized skylight for navigation may have developed early in insect phylogeny.

- (9307) MONNERAT, C., 1993. Les odonates de l'Étang Corbat, Porrentruy (Jura, Suisse). *Bull. romand Ent.* 11(2): 69-77. — (Noisetiers 2, CH-2824 Vicques).  
The odon. fauna (35 spp.) of the Corbat Marsh, canton Jura, Switzerland, is described and discussed. The occurrence of *Epitheca bimaculata* and, to some extent, that of *Libellula fulva* is of considerable regional interest.
- (9308) NAVASIA. *Noticario de la Oficina ibérica de la Sociedad Internacional de Odonatología (S.I.O.)*. — *Noticario de Oficina ibérica de la Sociedad Internacional de Odonatología (S.I.O.)*. Córdoba, Vol. 2 (Sept 1993). — (c/o Dr M. Ferreras Romero, Depto Biol: Animal (Zool.), Fac. Cien., Univ. Córdoba, Avda San Alberto Magno s/n, ES-14004 Córdoba).  
Vol. 1 (as No. 1) is listed in OA 8737. —  
C o n t e n t s: *Anonymous*: Los odonatos como tema de tesis doctoral en la universidad española (pp. 1-2); — *Ferreras Romero, M.*: Obituario [Dra Janny Margaretha van Brink] (p. 2); — *Anuncios* (pp. 3-5); — *Santos Quirós, R.*: Observaciones de *Hemianax ephippiger* (Burmeister) en tres localidades de la provincia de Sevilla, sur de España (Anisoptera: Aeshnidae) (pp. 5-6); — *Novedades de la odonatología ibérica* (pp. 6-7; 16 titles).
- (9309) NEWSLETTER [OF THE] BRITISH DRAGONFLY SOCIETY, No. 24 (Autumn, 1993). — (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG; UK).  
The Society has now 1204 members and, as apparent from the "Message of the President" (A. McGeeny, p. 3), only 10% of them send in the records (over 60% of those providing odon. records for the National Records Centre at Monks Wood are not BDS members!). — The issue opens with a brief Editorial, expressing Editor's views re specimen collecting (p. 1), which is followed, on 8 pp., by 18 numbered news topics, brief reports, announcements, etc.
- The dragonfly Crossword, contributed by M.J. Parr (p. 7) is believed to be the first of its kind. The last page is devoted to the "Junior Section", as introduced in the previous issue. — Among lots of interesting reading, there are various reports on Field Meetings, containing noteworthy local records.
- (9310) O'CONNOR, N.A., 1993. The fauna of the Pranjip-Creightons Creek system in northern Victoria. *Occ. Pap. Mus. Victoria* 6: 54-60. — (Dept Environ. Manag., Victoria Univ. Technol., St Albans Campus, P.O. Box 14428 MMC, Melbourne, Vic. 3000, AU).  
The macroinvertebrate and fish fauna (incl. 6 identified odon. spp.) are listed for 10 sites on the system, Australia.
- (9311) OTT, J., 1993. Libellenvorkommen an Sand- und Kiesgruben in Abhängigkeit von der Nutzung als Angelsportgewässer. *Magdenburg. Gewässerschutzseminar 5* (Abgrabungseen: Risiken und Chancen): 20-21 [abstract only]. — (L.A.U.B., Hölzengraben 2, D-67657 Kaiserslautern).  
The impact of angling on the odon. community of sand and gravel pits, as evidenced (1989, 1991-1992) at 33 Rhineland-Palatinate localities (Germany), is briefly described.
- (9312) OTT, J., 1993. 12. Jahrestagung der GdO e.V. — Gesellschaft deutschsprachiger Odonatologen. *Z. Ökol. NatSchutz* 2(2): 135. — (L.A.U.B., Hölzengraben 2, D-67657 Kaiserslautern).  
A concise and informative report on the meeting, as given also in OA 9010, by the Symposium organiser and President of the GdO.
- (9313) PETALURA. *Annual Journal of the Specialist Group for Systematic and Phylogenetic Odonatology, S.I.O.*, Vol. 1 (Oct. 16, 1993). Edited by, and available from: G. Bechly (Breslauer Str. 30, D-71034 Böblingen).  
[For general information cf. OA 9017.] — *Gorb, S.*: The skeleton-muscle organization of the head fixation system in odonates and its evolutionary implications: a comparative study (pp. 1-18); — *Bechly, G.*: A brief report of an ongoing cladistic study on the phylogenetic relationships of the fossil and extant odonate family group taxa (pp. 19-20); — *Lohmann, H.*: Short

- report from the International Symposium of Odonatology in Osaka, Japan, 01-11 August 1993 (p. 20); – *Reviews* (pp. 21-28; all by G. Bechly, i.e. vols listed in OA 8942, 8988, 9152); – *New books* (p. 28); – *Announcements* (p. 29); – *Membership directory* (pp. 30-40).
- (9314) PETRUSENKO, A.A., L.F. KOVAL' & A.S. TYAGUNOV, 1993. *Troficheskie svyazu zha v prirodnyh ekosistemah Ukrainy. – Hedgehog in tropical nets of natural Ukrainian ecosystems*. Inst. Zool., Ukrain. Akad. Sci. [Preprint No. 39.2], Kiev. 58 pp. (Russ., with Engl.s.). – (Dept Pop. Ecol., Schmalhausen Inst. Zool., Ukrain. Acad. Sci., B. Chmelnickogo Str. 15, UKR-252601 Kiev).  
Lestes barbarus, Cordulia aenea and Symptetrum flaveolum were identified among the 341 animal spp. represented in the hedgehog diet in Ukraine.
- (9315) PILON, J.-G. & D. LAGACÉ, 1993. Captures d'odonates aux Iles-de-la-Madeleine. *Fabriques* 18(2): 67-68. – (Dép. Sci. biol., Univ. Montréal, C.P. 6128, Montréal, Que., H3C 3J7, CA). 9 spp., collected during a week in Aug. 1992, at various localities in the Magdalen Isls, Quebec, Canada, are listed. – Cf. also OA 8413, 9019.
- (9316) PRITCHARD, G., M.H. MCKEE, E.M. PIKE, G.J. SCRIMGEOUR & J. ZLOTY, 1993. Did the first insects live in water or in air? *Biol. J. Linn. Soc.* 49: 31-44. – (First Author: Dept Biol. Sci., Univ. Calgary, Calgary, AB, T2N 1N4, CA).  
The arguments and evidence for a terrestrial vs an aquatic origin for the Insecta are evaluated. The evidence falls into three categories: (1) evidence that does not support one view more than the other; (2) speculative evidence, which should carry little weight; and (3) evidence that does support one view more than the other. Category 1 includes evidence from locomotory and osmoregulatory systems; plausible functions have been proposed for 'protowings' in both aquatic and terrestrial environments, while locomotory and osmoregulatory mechanisms of insects shed little light on their origins. Fossils, phylogenetic speculation, gill structure and life histories fall into category 2, in which, although speculative, the evidence favours a terrestrial origin. The earliest fossil hexapods were apparently terrestrial and unequivocally aquatic hexapods do not appear until 60-70 million years later, while sister-group relationships point to a terrestrial life style from at least the Hexapoda-Myriapoda stem group. The great variation in gill structure, even within orders, suggests convergence, and the more or less completely aquatic life histories are better interpreted as steps towards independence from land, rather than signs of an aquatic origin. Category 3 includes evidence from the tracheal system. In order to have evolved in water, a tracheal system must have first invaginated, then connected with the body wall for gas exchange with the water, and thirdly connected with the internal organs. It is difficult to envisage functions for the first two stages; on the other hand, the system could have readily evolved on land by invagination of respiratory surfaces, and then have been modified to effect gas exchange in water via gills.
- (9317) PROESS, R., 1993. Die Libellen von zwei stehenden Gewässern im Eischtal (Luxemburg). *Bull. Soc. Nat. luxemb.* 94: 173-187. (With Engl.s.). – (8 b, rue de Schandel, L-8715 Everlange).  
24 spp. (of which 14 breeding) are recorded from 2 ponds in western Luxembourg. Information on the abundance and phenology is also provided.
- (9318) PROGRAM AND GENERALITIES [of] the Twelfth International Symposium of Odonatology, Osaka, Japan, 1993. Compiled by K. Inoue. Issued by the Societas Internationalis Odonatologica (S.I.O.), Osaka, Japan. ii+34 pp. – (c/o SIO Central Office, P.O. Box 256, NL-3720 AG Bilthoven).  
Preface (p. 1); – Symposium Officers (p. 2); – Organizing Committee (p. 2); – Committee of Honour (p. 3); – SIO Members of Honour attending the XII International Symposium of Odonatology (p. 3); – Supported by (p. 3); – Patronage (p. 3); – Donations (p. 4); – Cooperation (p. 4); – Acknowledgements (p. 4); – General information (pp. 5-7); – Akatombo (p. 8); – Program (pp. 9-22); – List [and addresses] of participants (pp. 23-34).

- (9319) RASTETTER, V., 1993. Schmetterlingshaft (Libelluloides coccajus) und Gebänderte Heide-libelle (Symptetrum pedemontanum) im Oberelsass. *Mitt. bad. Landesver. Naturk. NatSchutz* (N.F.) 15(3/4): 635-636. — (26 rue de la Délivrance, F-68440 Habsheim).  
S. pedemontanum is recorded from the vicinity of Munchhouse, Haut-Rhin, France, and the locality is briefly described.
- (9320) ROBILLER, F.C., 1993. Paarungszeremonie der Gebänderten Prachtlibelle. *Fotografie draussen* 24(7): 21. — (Author's address not stated).  
A brief description of copulation in *Calopteryx splendens*, with a photograph.
- (9321) ROLFES, W., 1993. Libellen — fliegende Edelsteine. *Fotografie draussen* 24(7): 16-19; Appendix: "Aus Frust wurde Lust. Tips zur Libellenfotografie", on p. 20. — (Author's address not stated).  
General, with good photographs. Of some interest is the Appendix, giving some technical suggestions re the equipment, timing and other requirements in dragonfly photography.
- (9322) ROSENBERG, J., 1993. Die Libellenfauna einer Grossstadt am Beispiel Köln. *Verh. westdt. Ent. Tag.* 1991: 109-118. — (Sommerhaus 45, D(W)-5010 Bergheim-Glessen).  
While the paper listed in *OA* 8586 presents solely the 1990 records (23 spp.), in the present publication the results of the 1991 field work are also included, bringing the odon. fauna of the Cologne city area up to 32 spp. The emphasis is on the comparison between the pond and gravel pit assemblages.
- (9323) [RUDOLPH, R.], 1993. Tierforscher. Flugkünstler-Libellen. *TV neu* [Germany] 1993(44), issue of 28 Oct. — (c/o Prof. Dr R. Rudolph, Biol.-Didaktik, Univ. Münster, Fliednerstr. 21, D-48149 Münster).  
A brief note in the TV programme weekly, on the occasion of Prof. Rudolph's TV interview (channel Germany Nord 3; broadcast Nov. 9 & 10, 1993; duration 15 min). In the interview, his odonatol. laboratory and field research, and his dragonfly filming were outlined.
- (9324) RUMMEL, W., 1993. Zweigestreifte Quelljungfer bei der Eiablage. *Fotografie draussen* 24(7): 22. — (Author's address not stated).  
A good and detailed account of oviposition behaviour in *Cordulegaster boltonii*, with 2 photographs.
- (9325) SCHMID, R. & E. SCHMIDT, 1993. Die Frühe Heidelibelle *Tarnetrum fonscolombii* als Vermehrungsgast in Ostfriesland und im Westmünsterland. *Verh. westdt. Ent. Tag.* 1991: 119-124. — (Second Author: FB 9, Univ. Essen, Universitätsstr. 15, D-45141 Essen).  
[Not available for abstracting].
- (9326) SCHNEIDER, W. & F. KRUPP, 1993. Dragonfly records from Saudi Arabia, with an annotated checklist of the species from the Arabian peninsula (Insecta: Odonata), *Fauna Saudi Arabia* 13: 63-78. (With Arab s.). — (Abt. Zool., Hessisches Landesmus., Friedensplatz 1, D-64283 Darmstadt).  
*Sympetrum decoloratum sinaiticum*, *Palpopleura deceptor* and *Macrodiplax cora* are added to, and *Epallage fatime* is omitted from the list of spp. occurring in Arabia (now 56). The annotations in the checklist include the synonymy, bibliographic references, the exact collection data of new records, a statement on the regional distribution, and various comments, where considered necessary.
- (9327) SCHRIDDE, P., U. ANDERS & C. LINGNAU, 1993. *Orthetrum brunneum* (Fonscolombe, 1837) (Odonata: Libellulidae) im Naturschutzgebiet Riddagshausen bei Braunschweig. *Braunschw. naturk. Schr.* 4(2): 313-320. (With Engl.s.). — (Zool. Inst., Techn. Univ., Pockelsstr. 10a, D-38106 Braunschweig).  
A breeding population of *O. brunneum* nr Braunschweig is described. This is the first breeding record from Lower Saxony. The peculiarities of the habitats within the northern range of the sp. are discussed.
- (9328) SMITH, T., 1993. They're flocking to Jurassic Park of the insect world. *Evening Telegraph*, issue of Aug. 26, p. 9. — (c/o Mr R. Mackenzie Dodds, 62 Holland Park, London, W11 3SJ, UK).  
Daily's interview with R. Mackenzie Dodds,

Manager of the Ashton Water Dragonfly Sanctuary (Ashton Wold, Ashton nr Oundle, Peterborough, PE8 5LZ, UK). The popularity of the Sanctuary is apparent from the information at its last open day in 1993, 400 visitors were given guided tours around the lake (16 odon. spp.), situated on a 5-acre site, donated by Miriam Rothschild.

(9329) SPIERLING, A. & M. HARTMANN, 1993. Heidelibelle sucht Unterschlupf für den Winter. *Vorpommern-Kurier, Demmin*, issue of Sept. 16. A casual dragonfly article in a local East German daily. The title is misleading, and no suggestions are made in the text re the hibernation of adult *Sympetrum* spp.

(9330) STEINER, G., 1993. Ist Spekulation in der Biologie noch erlaubt? *Naturw. Rundschau* 46(19): 401-403. — (Author's current address unknown).

Contains a tentative speculation as to the way the Upper Jurassic Archaeopteryx could be feeding on dragonflies.

(9331) VAN BUSKIRK, J., 1993. Population consequences of larval crowding in the dragonfly *Aeshna juncea*. *Ecology* 74(7): 1950-1958. — (Inst. Ecosystem Stud., Box AB, Millbrook, NY 12545, USA).

Sources of density dependence in an odon. population were studied with the objective to reveal how population size is controlled. *A. juncea* larvae, inhabiting rock pools on the Lake Superior shoreline at Isle Royale, Michigan, USA, showed clear evidence of competition when natural densities were high. After 2 yrs of larval growth, individuals in crowded pools were developmentally delayed and survived less well than individuals in sparsely populated pools. The stunted larvae caught up with individuals in less crowded pools and reached the final instar in sufficient time to emerge in the summer of their 3rd yr, but even so their final body size remained relatively small. A 5-wk field experiment in natural pools demonstrated the causal connection between density and fitness: feeding activity and growth rates were significantly reduced under crowded conditions, but survival showed no response to density. In unmanipulated rock pools, however, natural increases in

density from one year to the next were met with slightly overcompensatory decreases in annual survival. The results illustrate that density dependence operates in a way that could contribute to population regulation in *A. juncea*, and a 6-yr time series from one of the two study areas showed significant evidence for density-dependent dynamics. — For a similar preliminary abstract cf. *OA* 8593.

(9332) VAN PELT, G.J., 1993. Notes on some Chinese and Himalayan Cordulegastridae (Insecta: Odonata: Anisoptera). *Zool. Meded.* 67: 265-282. — (Natn. Natuurh. Mus., P.O. Box 9517, NL-2300 RA Leiden).

East palaeartic Cordulegastridae from the collection of the late Dr M.A. Liefstinck are identified, redescribed and illustrated (*Neallogaster hermoniae* (Fraser), *N. ornata* Asahina, *Cordulegaster lunifera* Sel., *C. pekinensis* Sel., *C. jinensis* Zhu & Han).

(9333) VOUCHER-VON BALLMOOS, C., 1993. *Aeshna subarctica* Walker (Odonata: Aeshnidae): reproduction dans le Jura suisse — première mention. *Bull. romand Ent.* 11(2): 93-100 (With Engl.s.). — (Lab. Ecol. anim. & Ent., Inst. Zool., Univ. Neuchâtel, Chantemerle 22, CH-2000 Neuchâtel).

The status of *A. subarctica elisabethae* in Switzerland is (rather incompletely) summarised, and a breeding locality at Praz Rodet, Jura Mts, Switzerland, is brought on record. In addition, 2 new characters for its separation in the field from *A. juncea* are mentioned.

(9334) WACHTMANN, D. & H. KOMNICK, 1993. Dose-dependent incorporation of orally infused [ $^{14}$ C] oleic acid into the lipid classes of midgut, haemolymph and fat body of dragonfly larvae (*Aeshna cyanea*). *Comp. Biochem. Physiol.* (A)106(2): 397-402. — (Inst. Cell Biol., Univ. Bonn, Ulrich-Haberland-Str. 61 a, D-53121 Bonn).

5 different doses of radioactive oleic acid (ranging from 1.87 nmoles to 5.61  $\mu$ moles) were administered. Its incorporation into the midgut epithelium, haemolymph and fat body increased with the dose and time. Low doses caused up to 95% phospholipid labelling in the midgut wall, while labelled triacylglycerol was less



than 1%, but increased with the doses to a maximum of 68%. The data favour the glycerophosphate pathway of oleic acid esterification. At low doses oleic acid was mainly released into the haemolymph from the midgut phospholipid pool, and at high doses from the triacylglycerol pool. Diacylglycerol was the most heavily labelled lipid class of the haemolymph, amounting up to 98% and slightly decreasing with time. The fat body showed a dose- and time-dependent increase in labelled phospholipid and triacylglycerol, maximally amounting to 14 and 90%, respectively.

- (9335) WASSCHER, M. & M. SOESBERGEN, 1993. Drie matig voedselrijke wateren in Twente. — [Three moderately eutrophic water bodies in the Twente distr., The Netherlands]. *Natura* 90(9): 199-204. (Dutch). — (First Author: Minstraat 15bis, NL-3582 CA Utrecht).

The habitat, phytoplankton, zooplankton and the odon. fauna are described of 3 private property ponds. In addition, detailed chemical data are provided and the current faunal assemblages are compared with the evidence gathered (more or less incidentally) some 3 decades ago.

- (9336) ZHOU, W., H. LUO, Y. HU & X. WU, 1993. Notes on Chinese *Macromia* (Odonata: Corduliidae, Macromiinae). *J. Yunnan agric. Univ.* 8(2): 111-114. (Chin., with Engl.s.). — (First Author: Dept Ent., Zhejiang Mus. Nat. Hist., Gu-shan, Hang Zhou, P.R. China).

6 spp. are dealt with. Among these, *M. yunnanensis* sp.n. is described and illustrated as new (holotype ♂: Xishuangbanna, Yunnan; 25-VIII-1984), and the ♀ of *M. malleifera* Lieft. is described for the first time. The types are in the Zhejiang Mus. Nat. Hist., Hang Zhou.

- (9337) ZINTZ, K., D. ROTHMUND & H. RAHMANN, 1993. Kiesgruben im Voralpenland — schützenswerte Ersatzlebensräume? *Verh. Ges. Ökol.* 22: 273-277. (With Engl.s.). — (Inst. Zool., Univ. Hohenheim, D(W)-7000 Stuttgart-70).

The investigations of 169 small gravel pits in S Germany (Ravensburg distr.) show that early succession stages are rather rare, therefore they do not substitute for the lost habitats in the unregulated river valleys to the extent usually assumed. The occurrence of various ecological odon. types in the ponds at different succession stages is shown in a graph.

- (9338) ZLOTY, J., G. PRITCHARD & R. KRISHNARAJ, 1993. Larval insect identification by cellulose acetate gel electrophoresis and its application to life history evaluation and cohort analysis. *Jl N. Am. benthol. Soc.* 12(3): 270-278. — (Second Author: Dept Biol. Sci., Univ. Calgary, Calgary, AB, T2N 1N4, CA).

Early instar larvae that lack distinguishing structural characters can be identified quickly and easily with cellulose acetate gel electrophoresis. Examples are given from the genera *Ameletus* (Ephem.) and *Coenagrion*, *Enallagma* and *Lesites* (Odon.). 28 or 29 enzymes were tested, which yielded up to 29 scorable loci; of these only 6 or 7 were necessary to achieve species separation at 3 or more loci. The technique facilitates the search for structural characters, confirms species separation based on morphology, and allows the construction of complete life histories and life tables.

## Erratum

- (9093) [Annotation, as appended to the title of *P.S. Corbet's* presentation]: According to the *Author's* personal communication to the *Editor*, dated 7 January 1994, "this statement is incorrect and it also reflects unfavourably upon (his) response to invitations to symposia". — For the unfortunate publication of the not easily verifiable statement, the *Editor* has expressed his regret and offered the apology in a personal communication to the *Author*, dated 12 January 1994.