ODONATOLOGICAL ABSTRACTS

1974

(9479) HAYASHI, J., 1974. [A tool for catching alive aeshnids, as used in Tokyo before World War II]. *Gekkan-Mushi* 44: 21-23. (Jap.). – (Author's current address unkown).
A detailed description of the "*toriko*" tool and technique. – For some other publications on this subject cf. *OA* 9491.

(9480) MINELLI, A., 1974. Studio preliminare della fauna di Treviso con riflessioni sulla fauna degli ambienti urbani. *Atti Inst. veneto Sci.* (Sci. mat. nat.) 132: 115-156. – (Dipto Biol., Univ. Padova, Via Trieste 75, I-35121 Padova).
From the city of Treviso (i.e. Sile R. and various ponds), Veneto, Italy, 20 odon. spp. are listed along with brief field notes.

1980

(9481) HEIMER, W., 1980. "Taubensemd" – Entstehung und Entwicklung eines Naturschutzgebietes. *Z. Vogelk. NatSchutz Hessen* 1: 28-35. – (Author's current address unknown).
6 odon. spp. are reported from a freshly man-made pond in the Dieburg-Lengfeld area. Darmstadt-Dieburg distr., Germany.

(9482) HEYNE, K.-H., 1980. Das Panzbruch bei Greimerath: Kurzbeschreibung, Tier- und Pflanzenwelt, *Dendrocopos* 7: 54-59. – (Authors current address unknown).
Gives a checklist of 7 odon. spp. (identification of Lestes dryas is marked as uncertain) from a locality nr Greimerath (alt. 415 m), Trier-Saarburg distr., Germany.

(9483) [ZUBER, M.], 1980. [Aus dem Naturhistorischen Museum der Burgergemeinde Bern] Das Leben der Libellen beginnt im Wasser. *Berner Ztg*, issue of 27 Oct. 2 pp.
An exhaustive presentation of dragonfly life in a leading Swiss daily, with reference to the status of the fauna of the Berne vicinity (36 spp., without names). – For a reprint cf. *OA* 9488.

1983

(9484) GLOTZHOBER, R.C., 1983. Ohio's dragons: plentiful and prolific. *Echoes Ohio hist. Soc.* 22(8): 1 p. [reprinted in the work listed in *OA* 9510, p. 3]. – (Ohio Hist. Soc., 1982 Velma Ave., Columbus, OH 43211-2497, USA).
A general text on dragonfly biology.

1985

(9485) PETERLIN, S. & J. VIDIC, 1985. Biotopi v Sloveniji. – [Biotopes in Slovenia]. *Pionir, Ljubljana* 41(1): 21-25, (3): 21-26, (4): 21-25. (Slovene). – (Second Author: Inst. Conserv. Nat. & Cult. Heritage, P.O. Box 176, SLO-61001 Ljubljana).
Directed at the general reader, the article contains a few odon. records for Slovenia, viz. Škrabče on the Bloke Plateau (Calopteryx virgo, Libellula depressa; [3], p. 26) and Globočaj nr Brestovica-pri-Povirju-na-Krasu (Sympetrum sanguineum; [4], p. 23).

(9486) WEBER, T., 1985. Die entomologische Arbeit im Kreis Neustrelitz. *Zool. Rundbr. Neubrandenburg* 4: 34-36. – (Author's current address unknown).
Gives a concise review of odonatol. exploration of, and publications on the odon. fauna of the district of Neustrelitz, Mecklenburg, Germany (1855-1978).

1986

(9487) DOLMEN, D. & F. REFSAAS, 1986. Verneverdige øyenstikkerlokaliteter i Trøndelag: artsforekomst, økologi og vernetiltak. – [Dragonfly localities in the Trøndelag worth of conservation], *Rapp. Director. Naturforvalt.* 4: 1-38. (Norw., with Engl.s.). – (Mus., Univ. Trondheim, N-7004 Trondheim).
The odon. assemblages at 37 localities in the Trøndelag counties, Norway, are described. Among the 19 spp. evidenced, Lestes sponsa, Ischnura elegans, Coenagrion armatum, erythromma najas and Sympetrum nigrescens are of particular local interest. The odon. survival and dispersal possibilities within the concept of "habitat islands" are discussed. Protective measures are suggested for the odonatologically most valuable localities.

(9488) [ZUBER, M.], 1986. Das Leben der Libellen beginnt im Wasser. *Schweizerischer Tierschutzkalender* 1986: 19-26.
A reprint of the article as listed in *OA* 9483. The 2 original phots are replaced by a col. pl.

1987

(9489) HIRVONEN, H. & R. ESA, 1987. Predatory behaviour of dragonfly nymphs (Odonata). *Trärminne Stud.* 1987(4): 26. [Abstract only]. – (Integrative Ecol. Unit, Dept Zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00710 Helsinki).
[Verbatim]: Zooplankton predation by larvae of 4 Anisoptera spp. and 1 Zygoptera sp. inhabiting rock-pools was studied. Experiments were made in laboratory aquaria. Daphnia magna of different sizes were used as prey. Clear preference for larger instead of the most profitable prey size was observed in almost all larval instars of the four anisopteran species. Larger larvae showed stronger size selectivity. Time of starvation alone did not affect feeding rate and size selectivity in Aeshna. Lestes larvae consumed more small prey although they made more strikes on larger prey. Both Aeshna and Lestes showed stronger size-selectivity in dark than in light conditions. This is probably due to different prey detecting cues used in different light conditions. Functional response of Lestes followed the Holling II type curve. Time spent searching and pursuing prey per strike decreased with increasing prey density. In the habitat experiments larvae of both Aeshna and Leucorrhinia preferred habitats that give shelter from predators, e.g. stones and vegetation.

(9490) HOESS, R., 1987. *Bestandesaufnahme der Libellen und Laufkäfer in der Ziegelei Rehhag.* Semesterarbeit Gymnasium Neufeld, Bern. 74 pp. – (Normannenstr. 35, CH-3018 Bern).
Contains a checklist of 24 odon. spp., evidenced at a clay pit at Bümpliz, Bern, Switzerland. Annotations on the local abundance and col. phots are provided for all spp.

(9491) KANAMARU, F., 1987. [My culture]. *Yomiuri Shimbun*, issue of July 18. (Jap.). – (c/o Y. Hatto, 4-17-19 Yakumo, Meguro-ku, Tokyo, 152, JA).
A note on the traditional "*toriko*" technique for catching dragonflies, in the second largest Japanese national newspaper. For details see *Odonatologica* 23(3)[1994]: 283-289. – Cf. also *OA* 9479, 9539.

1988

(9492) HIRVONEN, H., 1988. *Sudenkorentojen toukkien saalistuskäyttäytyminen: saalistustehokkuus ja saaliin koon valinta.* – [*Predatory behaviour of dragonfly larvae: foraging efficiency and prey size selection*]. M. Sc. thesis, Dept Zool., Univ. Helsinki. 118 pp. (Finish). – (Integrative Ecol. Unit, Dept Zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00710 Helsinki).
For a published Engl. abstract cf. *OA* 9518.

1989

(9493) [KRUŠNIK, C. et al.], 1989. *Ekološka študija pri projektu Fiesa-Piran.* – [*Ecology assess-*

ment for the Fiesa-Piran project]. Intermunicipal Dept Natural & Cultural Heritage, Piran. ii+43 pp. [references etc. excl.] (Slovene). – (Author: Inst. Biol., Univ. Ljubljana, Karlovška 19, SLO-61000 Ljubljana, Slovenia; – Publishers: Medobčinski zavod za varsvo naravne in kulturne dediščine, SLO-66330 Piran, Slovenia).
The environmental quality and the fauna and flora are assessed of 2 man-made "lakes" in Fiesa nr Piran, NW Istria, Slovenia. 6 odon. spp. are recorded in adult, and 4 spp. in larval stage. – For a comprehensive treatment of the odon. fauna of this locality cf. *OA* 9541.

(9494) MALKMUS, R., 1989. Kinder des Lichtes und der Lüfte sind die Libellen [...]. *Spessart*, Aschaffenburg 1989(2): 3-9. – (Schulstr. 4, D-97859 Wiesthal).
General, on dragonfly morphology, biology, ecology and conservation; in a local Bavarian monthly.

(9495) THOMPSON, D.J., 1989. Dragonflies in caves. *Cave Sci.* 16(2): 75. – (Pop. Biol. Res. Gr., Dept Environ. & Evol. Biol., Univ. Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK).
A note on the occurrence of Gynacantha nourlangie in various caves in the Napier Range, Kimberley, Australia, with a request for information on dragonfly sightings in the caves elsewhere. – Cf. *OA* 9614.

(9496) TRATNIK, M., 1989. *Primerjava in ovrednotenje postopkov za nabiranje bioloških vzorcov vodnih žuželk.* – [*Comparison and evaluation of various sampling methods for aquatic insects*]. M. Sc. thesis, Univ. Ljubljana. vi+56 pp. (Slovene). – (Author's current address unknown).
Larval Platycnemis sp., Onychogomphus sp. and Ophiogomphus serpentinus are recorded from 2 localities on the Dragonja R., NW Istria, Slovenia.

1990

(9497) BRUENS, A., 1990. *Die Odonaten (Insecta) des Schilfgürtels vom Belauer See (Schleswig-Holstein), ein Beitrag zur Okosystem-forschung im Bereich der Bornhöveder Seenkette.* DiplArb., Math.-naturw. Fak. Univ. Kiel. iv+102 pp., Appendix 6 pp. excl. – (Sandkrugweg 57a, D-22457 Hamburg).
The work forms a part of a broader research project on the ecosystem of the Bornhöved lake chain, Schleswig-Holstein, Germany. The odon. fauna of the Belau Lake (16 spp.) is described (with field notes on all spp.). The emphasis of the work lies on the Coenagrion pulchellum and Ischnura elegans life history studies and on the results of a very detailed field and laboratory inquiry into biological productivity of these 2 spp. The assessment is based on the parameters such as consumption, excretion, respiration, secretion, losses during molting, and on the instar longevity. – Although not apparent from the title, this is a far-reaching and outstanding work, the publication of which in a more readily accessible form would be certainly most useful.

(9498) CAMPADELLI, G. & E. CONTARINI, 1990. Insetti delle zone umide salmastre della costa emiliano-romagnola. *In*: F. Corbetta, [Ed.], Aspetti naturalistici delle zone umide salmastre dell'Emilia-Romagna, pp. 125-146, Grafiche Zanini, Bologna. – (First Author: Ist. Ent. "G. Grandi", Univ. Bologna, Via Filippo Re 6, I-40126 Bologna).
Calopteryx splendens, Lestes barbarus, L. viridis, Ischnura elegans, Aeshna mixta, Libellula depressa, Orthetrum albistylum, Sympetrum sanguineum and S. striolatum are reported from brackish coastal water bodies of the Emilia-Romagna region, Italy. No particular comments are added.

(9499) CHOWDHURY, S.H. & M.I. MIAH, 1990. Descriptions of four zygopteran larvae from the Chittagong University Campus. *Chittagong Univ. Stud.* (II)14(1): 127-136. (With Bengali s.). – (Dept Zool., Univ. Chittagong, Chittagong, Bangladesh).
Detailed ultimate instar descriptions and figs of Ceriagrion cerinorubellum, Agriocnemis femina, A. lacteola and Copera annulata.

(9500) DOLMEN, D., 1990. Ferskvannsbiologiske og hydrografiske undersøkelser av Verneplan IV-vassdrag i Trøndelag 1989. – [Freshwater biological and hydrographical investigations of the Conservation Plan IV water courses in the Trøn-

delag, 1989]. *Rapp. Vitenskapsmus. Univ. Trondheim* (Zool.) 1990(6): 1-72. (Norw.). – (Mus., Univ. Trondheim, N-7004 Trondheim).
11 odon. spp. are recorded from various localities in the southern and northern Trøndelag, Norway.

(9501) FANCIULLI, P.P., 1990. Ordine Odonata. *In*: F. Giusti, [Ed.], Carta della natura/1. Provincia di Siena. Gli invertebrati, pp. 150-152, Nuova Immagine, Siena. – (Author's address unknown).
Based on literature, 29 odon. spp. are listed, and a comprehensive regional odonatol. bibliography is provided (Siena prov., Tuscany, Italy).

(9502) HOESS, R., 1990. *Bericht über die Naturschutzgebiete um Kandersteg und auf der Engstlenalp sowie anderer Gebiete. Zusatzbemerkung betreff Pflanzenschutzgebiet Niesen.* Bericht an NatSchutzInspekt. Bern, Bern. 12 pp. – (Author: Normannenstr. 35, CH-3018 Bern; – Naturschutzinspektorat Kanton Bern: c/o Dr D. Forter, Kramgasse 68, CH-3011 Bern).
A brief description of 28 wetland and odon. localities in the Kandersteg and Engstlenalp areas (alt. 870-2060 m), with annotations on 13 odon. spp., and comments on the status of Somatochlora arctica in canton Bern, Switzerland.

(9503) RESH, V.H., J.R. BARNES & D.A. CRAIG, 1990. Distribution and ecology of benthic macroinvertebrates in the Opunohu river catchment, Moorea, French Polynesia. *Annls Limnol.* 26(2/3): 195-214. – (First Author: Dept Ent., Univ. California, Berkeley, CA 94720, USA).
Larvae of Pacificagrion sp. were found in most stations. At a given site and season, they ranged in length from 2 to 12 mm, suggesting a multiple cohort pattern. In addition, several early instars of a libellulid sp. were found in austral spring collections. – For the second report on this research project cf. *OA* 9523.

(9504) ROY, S.P., 1990. Evaluation on the exploitation of fish-pond organisms by certain predatory insects in an aquaculture pond at Bhagalpur. *J. Freshw. Biol.* 2(3): 257-264. – (Post-Grad. Dept Zool., Bhagalpur Univ., Bhagalpur-812007, India).
The seasonal variations in the percentage composition of the major dietary components and forage ratio in larval Ischnura sp., Mesogomphus lineatus, Potamarcha sp. and Zyxomma sp., in a fishpond at Bhagalpur, Bihar, India, are dealt with.

1991

(9505) CARCHINI, G. & G. LA MESA, 1991. Animal community of cave streams and its relationships with surface and underground habitats. *Mém. Biospéol.* 18: 61-65. – (Dipto Biol., Univ. Tor Vergata, Via della Ricerca Scientifica, I-00133 Roma).
Contains a preliminary list of odon. larvae from a cave at Pastena, Lazio, Italy (Coenagrionidae sp., Sympetrinae sp., Somatochlora metallica). In a subsequent paper, listed in *OA* 8161, the detailed circumstantial evidence of these records is presented and S. metallica is corrected into S. meridionalis.

(9506) DOLMEN, D., 1991. Dammer i kulturlandskapet: makroinvertebrater, fisk og amfibier i 31 dammer i Østfold. – Ponds in the culture landscape: macroinvertebrates, fish and amphibians in 31 ponds in Østfold county. *ForskRapp. norsk Inst. Naturfors.* 20: 1-63. (Norw., with Engl.s.). – (Mus., Univ. Trondheim, N-7004 Trondheim).
The cattle and farmyard ponds are getting increasingly rare in Norway. The odon. assemblages of 31 of these are listed and commented upon here. Coenagrion hastulatum, Lestes sponsa and Aeshna grandis/juncea are the most commonly encountered spp. C. armatum is relatively rare; the sp. is associated with eutrophic habitats. Some management and conservation measures, based on the multiple-use principle, are proposed.

(9507) DOLMEN, D., 1991. Ferskvannsbiologiske og hydrografiske undersøkelser av 20 vassdrag i Møre og Romsdal 1988, Verneplan IV. – [Freshwater biological and hydrographical investigations of 20 water courses in Møre & Romsdal during 1988, Conservation Plan IV]. *Rapp. Vitenskapsmus. Univ. Trondheim* (Zool.) 1989(3): 1-105. (Norw.). – (Mus., Univ. Trondheim, N-7004 Trondheim).
A total of 12 odon. spp. are recorded from some

of the 20 water courses explored; Møre & Romsdal, Norway.

(9508) DOLMEN, D. & L.Å. STRAND, 1991. Evjer og dammer langs Glomma (Hedmark) og Gaula (Sør-Trøndelag): en zoologisk undersøkelse over status og verneverdi, med hovedvekt pa Tjønnområdet, Tynset. – [Oxbow lakes and ponds along the Glomma (Hedmark) and Gaula (S Trøndelag) rivers: a zoological investigation of conservation status and value, with emphasis on Tjønnområdet, Tynset]. *Rapp. Vitenskapsmus. Univ. Trondheim* (Zool.) 1991(3): 1-23. (Norw.). – (Mus., Univ. Trondheim, N-7004 Trondheim).
9 odon. spp. are reported from the 2 rivers: Norway. The records are briefly discussed.

(9509) FUJIYAMA, I., 1991. Late Triassic insects from Miné, Yamaguchi, Japan. 1. Odonata. *Bull. natn. Sci. Mus., Tokyo* (C) 17(2): 49-56. – (Shirako 3-19-6, Wako-shi, Saitama, JA).
From Carnian of the Ominé Coal Field, Triassoneura okafujii sp.n., Triassothemis nipponensis sp.n., and T. minensis sp.n. are described and illustrated. Types are deposited in Miné City Mus. Hist. & Folklore. For the reception of Triassothemis Carpenter, Triassothemidae fam.n. is erected and diagnosed.

(9510) GLOTZHOBER, R.C., 1991. *Dragonfly collector's handbook*. Ohio Odonata Survey, Columbus. 21 pp. – (Author: Ohio Hist. Soc., 1982 Velma Ave., Columbus, OH 43211-2497, USA).
The slim volume was designed as a training tool to use in workshops with people from various backgrounds, many with no schooling in natural science, but all deeply interested amateur naturalists. The Author is the Coordinator of the Ohio Odonata Survey, presenting here a brief outline of the objectives of the Survey, guidelines for odon. collecting, a checklist of the hitherto known Ohio spp., a brief bibliography of the useful key works, etc. – (*Abstracter's Note*: At present, the Ohio odon. database contains over 13.000 records, and a relative paper for *Argia* is in preparation).

(9511) MALKMUS, R., 1991. Der Kaltengrund/Zentralspessart: faunistische Grundlagen für ein Naturschutzgebiet. *Nachr. naturw. Mus. Aschaffenburg* 98: 43-70. – (Schulstr. 4, D-97859 Wiesthal).
Gives a checklist of 18 odon. spp.; Heigenbrücken-Neuhütten, (alt. 400-470 m), Zentralspessart distr., Bavaria, Germany.

1992

(9512) ALRUTZ, R.W., 1992. Additional records of dragonflies (Odonata) from Ohio. *Ohio J. Sci.* 92(4): 119-120. – (1 Sunset Hill, Granville, OH 43023, USA).
This is a contribution to the Ohio Odon. Survey, and includes 293 new county records for 65 spp. from 62 counties. Also included are 3 extensions of seasonal distributions, all based upon specimens collected during June-Aug., 1991. – (*Abstracter's Note*: The Ohio Odonata Survey was founded in 1991 by the Ohio Department of Natural Resources, and it is coordinated by R.G. Glotzhober [c/o Ohio Nat. Hist. Soc., 1982 Velma Ave., Columbus, OH 43211-2497, USA]. Its objective is to bring together distribution records of the 155 spp. so far reported from the state).

(9513) BERGERSON, O., 1992. Fotografering an insekter. – [Insect photography]. *Insekt-Nytt* 17(3/4): 53-54. (Norwegian). – (Senter for Industriforskning, P.O. Box 124 Blindern, N-0314 Oslo).
General, with emphasis on dragonflies.

(9514) CALAMANDREI, S. & F. TERZANI, 1992. Cataloghi del Museo di Storia Naturale, Sezione di Zoologia "La Specola" dell'Università di Firenze. XII. Odonata: revisione della vecchia collezione italiana (1870-1894) conservata a secco (Insecta: Odonata). *Atti Soc. toscana Sci. nat.* (B)99: 23-37. (With Engl.s.). – (Mus. Zool. "La Specola", Univ. Firenze, Via Romana 17, I-50125 Firenze).
A list of some 160 odon. specimens (Italy, 1870-1894), preserved in the Mus. collections, with the original text as appearing on labels, and with brief comments, where appropriate.

(9515) HIRVONEN, H., 1992. foraging strategies of larval damselflies Lestes sponsa. *Tvärminne Stud.* 1990/1991(5): 46. [Abstract only]. – (Integrative Ecol. Unit, Dept Zool., Univ. Helsinki,

P. Rautatiekatu 13, SF-00710 Helsinki).
[Verbatim]: L. sponsa is the most rapidly growing sp. The way is examined in which the larvae are able to alter their short-term feeding rate and predatory tactics in relation to increasing prey availability. Experiments were performed in laboratory aquaria using Daphnia magna as prey. As predicted, damselfly larvae showed an inversely density-dependent functional response to prey density. This was mainly due to prey handling time that became longer as prey density increased. Capture success declined as a function of Daphnia density, indicating a confusion effect. In support of the theoretical models of optimal search tactics, searching activity first increased and then decreased as prey density increased. At low prey densities the larvae pursued for the prey, because pursuit attacks were more profitable than ambush attacks. The utilization of a flexible foraging strategy may be adaptive for larval Lestes, because it gives higher average net rate of energy gain than adopting a fixed strategy. Higher energy gain is expected to lead to higher larval growth rate and increased reproductive success in individual L. sponsa. Future studies will focus on the degree of individual variation in foraging strategy.

(9516) HIRVONEN, H., 1992. Larval growth of the damselfly Lestes sponsa in rock-pools. *Tvärminne Stud.* 1990/1991(5): 46. [Abstract only]. – (Integrative Ecol. Unit, Dept Zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00710 Helsinki).
[Verbatim]: L. sponsa has a univoltine life-cycle. Larval growth is known to correlate with temperature and food acquisition. These factors vary considerably in different types of water bodies. The aim of this study is to examine how much individual growth rates vary within and between different types of rock-pools and ponds. Large permanent ponds never dry up, intermediate pools dry up a couple of times per decade and small temporary pools dry up every or almost every year during summer droughts. L. sponsa larvae benefit by completing their larval development and leaving risky pools before mid-July, when droughts most probably occur. This is best achieved by maximizing net rate of energy gain. On the other hand, an active life-style may risk a larva to predators. Larvae were sampled and measured in standard intervals. Larval development rates varied both within and between the pools. The factors affecting larval growth rate and its consequences on individual fitness will be studied in more detail in the near future.

(9517) HIRVONEN, H., 1992. Microhabitat selection by dragonfly larvae (Odonata). *Tvärminne Stud.* 1990/1991(5): 46-47. [Abstract only]. – (Integrative Ecol. Unit, Dept Zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00710 Helsinki).
[Verbatim]: Larvae of Aeshna juncea and Leucorrhinia rubicunda frequently coexist in rock-pools, but their microhabitat requirements seem to differ. In the first series of laboratory experiments the larvae were offered different types of microhabitats. Larvae of both species preferred structurally complex habitats with shelter, such as dense submerged vegetation. However, Aeshna-larvae more often chose habitats with vegetation, whereas Leucorrhinia-larvae preferred shaded habitat patches, even if they lacked sheltering macrophytes. In the presence of a fish predator, larvae of both species always choose the more covering substrate. Whether the predator was present or not, the larvae were aggressive toward each other and larger individuals chased smaller conspecifics to the less favourable habitat. The results indicate that these predatory insects have clear habitat preferences and they defend their refuge territories against intruders. In nature, individuals that are forced to move to and stay in unprotected habitats are more vulnerable to predators.

(9518) HIRVONEN, H. & R. ESA, 1992. Feeding efficiency and prey size selection by larval dragonflies (Odonata). *Tvärminne Stud.* 1990/1991(5): 47. [Abstract only]. – (Integrative Ecol. Unit, Dept Zool., Univ. Helsinki, P. Rautatiekatu 13, SF-00710 Helsinki).
[Verbatim]: Larval Aeshna juncea and Leucorrhinia rubicunda are common insect predators in the freshwater rock-pools and ponds of the Tvärminne area. We made laboratory experiments to uncover the factors affecting their feeding efficiency and prey size selection. Different sized Daphnia magna were used as prey. Feeding rate increased with larval instar and

prey density. In experiments with large prey both attack rate and capture rate decreased in the course of a foraging bout as a consequence of increased predator satiation. Clear preference for large Daphnia was observed in all larval instars of both dragonfly species. Proportion of large prey in larval diet increased with larval size. This trend was mainly due to the fact that larger larvae were more successful in capturing large prey than their smaller conspecifics. A model involving prey attack rates and prey vulnerability to capture accounted for the observed patterns of prey selection by Aeshna and Leucorrhinia larvae. Moreover, the observed changes in predator diets in the course of the feeding bouts fitted in with the predictions of a dynamic version of the classical diet model. – For the original Finnish work cf. *OA* 9492.

(9519) KAMINSKI, M. & L. KRZYSZTOFIAK, 1992. Intensity of invertebrate penetration of the nearshore zone of a polyhumic lake in summer. *Ekol. pol.* 40(1): 127-144. (With Pol.s.). – (Wigry National Park, Krzywe 82, PO-16-400 Suwalki).
Studies on structure and intensity of epigeic fauna penetration of the water-land ecotone zone were carried out at a woodland polyhumic lake in the Wigry National Park, NE Poland. Adult and larval odon. are briefly considered, but no spp. names are stated.

(9520) OKUMOTO, D., 1992. *Sumi, Tombo.* – [*Cicadas and dragonflies*]. Shueisya, Tokyo. 34 pp. [Fabre Insectarium Series] – ISBN 4-08--232002-4. (Jap.). – Price: ¥ 1200.- net. – (Publishers: 2-5-10 Hitotsubashi, Chiyoda-ku, Tokyo, 101-50, JA).
Directed at young children, the book provides some elementary information on biology, specimen preparation, etc.

(9521) OLSVIK, H., 1992. Vanninsekter. – [Aquatic insects]. *Insekt-Nytt* 17(3/4): 39-43. (Norwegian). – (N-6598 Foldfjorden).
A brief review of collecting and specimen preparation methods, with emphasis on dragonflies.

(9522) PICAZO, J., C. ZAMORA-MUÑÓZ & J. ALBA-TERCEDOR, 1992. Contribucion al estudio de los odonatos en la cuenca alta del Rio Guadalquivir (sur de la Peninsula Iberica). *Bolm Soc. port. Ent.* 139: 176. [Indicative abstract, Port. & Engl.]. – (Depto Biol. Animal & Ecol., Fac. Cien., Univ. Granada, ES-18071 Granada).
21 odon. spp. were contained in 744 macrobenthic samples, collected (1988-1991) at 38 streams in the Genil and Guadiana Menor R. basins, Spain. The Gomphidae prevailed. Ophiogomphus cecilia is new for Spain, the other spp. are not listed.

(9523) RESH, H., J.R. BARNES, B. BENIST-STEGER & D.A. CRAIG, 1992. Life history features of some macroinvertebrates in a French Polynesian stream. *Stud. neotrop. Fauna Environ.* 27(2/3): 145-153. – (First Author: Dept Ent., Univ. California, Berkeley, CA 94720, USA).
As far as the odon. are concerned, a Pacificagrion sp. was numerically dominant in the Opunohu R. catchment, Moorea, French Polynesia, as evidenced during 1988-1989. The sp. was more common at upstream sites than at downstream sites, and in austral fall than in austral spring. The range of larval sizes suggests that this is a multiple-cohort population. – For the first report on this research project cf. *OA* 9503.

(9524) SANTOLAMAZZA, S., A. CORDERO & C. UTZERI, 1992. Influencia de la competencia espermática sobre el comportamiento reproductor de la libélula Coenagrion scitulum. *Resum. 4 Congr. nac. & iberoamer. Etol., Extremadura*, p. 54. [Abstract only]. – (Third Author: Dipto Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Universitá 32, I-00185 Roma).
During each copulation, the ♂ C. scitulum translocates sperm into accessory genitalia and inseminates the ♀ up to 6 times. By measuring the amount of sperm in ♂♂ and ♀♀ from interrupted or completed copulations, the evidence was obtained that: (1) the multiple insemination behaviour of the ♂ actually involves repeated sperm transference to the ♀; – (2) all the sperm is transferred to the ♀ from vesicula spermalis; – (3) the sperm volume in the bursa, but not in the spermatheca, increases with the number of inseminations, and – (4) the total sperm volume in the ♀ after copulation is

the same as that transferred to her by the ♂. – It is concluded that the limited sperm displacement ability by the ♂ is balanced by multiple insemination, through which a higher dilution of the rival sperm is obtained.

(9525) SUI, J. & H. SUN, 1992. Odonata. *In*: Insects of the Hengduan Mountain Region, pp. 48-52. (Series of the Comprehensive Scientific Expedition to the Hengduan Mountains, Qinghai-Xizang plateau, Chinese Academy of Science), Science Press, Beijing, (Chin., with Engl.s.). – (Inst. Zool., Acad. Sinica, Haitien, Beijing--200025, P.R. China).
27 spp. are listed, with dates and altitude data, and with locality names in Chinese.

(9526) SUI, J., H. SUN & Z. LIU, 1992. Odonata. *In*: F. Hung, [Ed.], Insects of Wuling Mountain area, southwestern China, pp. 31-38, Science Press, Beijing. (Chin., with Engl.s.). – (First 2 Authors: Inst. Zool., Acad. Sinica, Haitien, Beijing-200025, P.R. China; – Third Author: Shanghai Inst. Ent., Acad. Sinica, Chunking Rd (S) 225, Shanghai-200025, P.R. China).
70 spp. are listed, with altitude data and locality names in Chinese.

(9527) TANI, K., 1992. *Suisei Seibutsu Shizenkansatsu*. – [*Guide for observation of aquatic animals*]. Yamatogawa River Construction Works Office, Ministry of Construction, Kashiwara, 20 pp. (cover incl.). (Jap.). – ISBN none. – (Publishers: 10-8, Taisho 2-chome, Kashiwara, Osaka pref., 582, JA).
The booklet is directed at young teenagers. Basically it is a pictorial guide for an approximate identification of animals, peculiar to the riverine, to various degrees polluted habitats. In various categories, the characteristic odon. spp. (genera) are also considered. – (The Author is a well known aquatic entomologist, active worker in several orders, and publisher of the odonatol. periodical, *Gracile*).

(9528) WENDLING, K. & B.W. SCHARF, 1992. [Limnology of Eifel maar lakes]. Macrozoobenthos including Ostracoda (Crustacea). *Arch. Hydrobiol.* (Beih.) 38: 239-262. (With Germ.s.). – (First Author: Landesamt Wasserwirtschaft Rheinland-Pfalz, Postfach 3024, D(W)-6500 Mainz-1).
Lists 8 odon. spp. from 8 lakes; Germany.

(9529) YANG, E.-C. & D. OSORIO, 1992. Integration of U.V. and other spectral receptor types by the dragonfly lamina in dark and in light adapted states. *Am. Zool.* 32(5): 69A. [Abstract only]. – (Centre Visual Sci., Res. Sch. Biol. Sci., Austr. Natn. Univ., P.O. Box 475, Canberra, ACT 2601, AU).
[Verbatim]: The ventral half of dragonfly compound eye contains 5 spectral receptor types, with sensitivity peaks ranging from 330 nm to 630 nm. The receptors synapse onto lamina monopolar cells (LMC's) which have a hyperpolarizing centre and a depolarizing antagonistic surround. We have been using intracellular recording with biotin labelling to study the way in which U.V. and other spectral receptors' outputs are integrated by the LMC's. Two of the five types of LMC's, types 2 and 4, receive U.V. and 520 nm inputs. The spectral sensitivities of their responses change on light adaptation. Whereas both cell types receive U.V. and 520 nm inputs when dark-adapted, on light adaptation cell type 2 becomes predominantly 520 nm sensitive and type 4 predominantly U.V. sensitive. The spectral sensitivities of the antagonistic surrounds are similar to those of the light adapted centre responses. In addition, the time courses of responses to 360 nm and 520 nm flashes differ in cell type 4 but not in type 2.

1993

(9530) ALRUTZ, R.W., 1993. An annotated list of new seasonal and county records for Ohio dragonflies (Odonata). *Ohio J. Sci.* 93(4): 105-108. – (1 Sunset Hill, Cranville, OH 43023, USA).
It includes 147 new county records (for 40 Ohio counties), plus 17 new seasonal records, together with notes on ecology and behaviour of selected spp. The work is based on material collected in 50 counties, during May-Oct., 1991-1992. – Cf. also *OA* 9512.

(9531) AOKI, T., 1992. *Larval development in Asiagomphus pryeri (Selys) in nature. I. (Anisoptera: Gomphidae)*. Author's translation of the original Jap. paper, listed in *OA* 9459. 3 pp. –

(Copies available from SIO Central Office, Bilthoven).
This is a typical spring sp. (sensu Corbet). There are 2 hibernations, the last of which at the final instar. The emergence is synchronous during mid May-early June; the oviposition ususally takes place during early June-early Aug., the eggs hatch within about 2-3 weeks. Consequently, by the time all eggs are hatched, the individuals of the young larval population are not of the same age and instar. The mechanisms enabling the population to reach the final instar and the emergence synchronously are described and discussed. – (The original figs & tab. are not included in this translation).

(9532) ARNOLD, A., 1993. Erstnachweis von Libellula fulva O.F. Müller (Odonata) in Sachsen. *Ent. Nachr. Ber.* 37(4): 260-261. – (Nordstr. 39/551, D-04105 Leipzig).
1 teneral ♂, 6-VI-1993, Rote Furt nr Torgau. This is the first record for Saxony, Germany. The habitat is described and 10 odon. spp., encountered on the same day, at the same locality, are listed.

(9533) BATTIN, T.J., 1993. The odonate mating system, communication and sexual selection: a review. *Boll. Zool.* 60: 353-360. – (Studienkoordination Okol., Univ. Wien, Althanstr. 14, A-1090 Wien).
In the odon. mating system, the communication comprises a visual and a tactile stage. Visual communication is confined to the ♂-♂ competitive interactions and to courtship display. The stage of tactile communication is initiated by tandem linkage. The idea is developed here that communication devices are in the odon. mating process an important target of sexual selection. The implications of sexual selection to these devices are briefly reviewed and their operation as potential reproductive isolation mechanisms is discussed.

(9534) BERNARD, R. & A. ŁABEDZKI, 1993. Wystepowanie Sympetrum pedemontanum (Allioni, 1766) (Odonata, Libellulidae) na niżu polskim. –. The occurrence of Sympetrum pedemontanum (Allioni, 1766) (Odonata, Libellulidae) in Polish lowlands. *Wiad. ent.* 12(3): 163-171. (Pol., with Engl.s.). – (First Author: Dept Gen. Zool., Mickiewicz Univ., Ul. Fredry 10, PO-61-710 Poznan).
The occurrence in the lowlands of central and northern Poland (22 localities, of which 7 new) is reviewed, habitat ecology is analysed, general status of the sp. in Poland is discussed, and it is tentatively suggested the recent increase of records could indicate its current expansion.

(9535) BUCHWALD, R., A. HEITZ, S. HEITZ, B. HÖPPNER, B. SCHMIDT & K. STERNBERG, 1993. Rote Liste der Libellen in Baden-Württemberg (Stand: Februar 1992). *In*: C. Antesberger, [Ed.], Arten- und Biotopschutzprogramm Baden-Württemberg, Bd 2, pp. III/B 12-13 (Rote Liste), VII/B 1-21 (Fliesswasserlibellen), Landesanst. Umweltschutz, Karlsruhe, ISBN 3-88251-144-3. – (First Author: Inst. Biol. II/Geobotanik, Univ. Freiburg, Schänzlestr. 1, D-79104 Freiburg/Br.).
Red List for Baden-Württemberg, Germany (47 out of 72 spp.), with an appended, very detailed account on the local status, distribution (incl. maps), habitat requirements, etc. of the rheophilous spp. – Cf. also *OA* 9169, 9254.

(9536) CHUNG, K., J.B. WALLACE & J.W. GRUBAUGH, 1993. The impact of insecticide treatment on abundance, biomass and production of litterbag fauna in a headwater stream: a study of pretreatment, treatment and recovery. *Limnologica* 23(2): 93-106. – (First Author: Dept Ent., Univ. Georgia, Athens, GA 30602, USA).
Methoxychlor was applied seasonally for 3 yr to 1 of 2 small headwater streams in a 1626 ha drainage basin located in the Nantahala Mountain range, W North Carolina. The data include those on Cordulegaster sp. and Lanthus sp. The former showed very high biomass during the second yr of recovery (>9 x of the pretreatment level).

(9537) CZACHOROWSKI, S., K. LEWANDOWSKI & A. WASLEWSKA, 1993. The importance of aquatic insects for landscape integration in the catchment area of the River Gizela (Masurian Lake District, northeastern Poland). *Acta hydrobiol.* 35(1): 49-64. (With Pol.s.). – (Inst. Biol., Teacher Training Coll., ul. Zolnierska 14, PO-10-561 Olsztyn).
Samples include 150 odon. larvae, referable to

11 spp., of which Coenagrion hastulatum is the dominant sp., followed by Lestes sponsa in Sympetrum flaveolum. Faunal similarities between all the sampling stations were examined and are graphically shown for each order, incl. the odon., for which the number of individuals and spp. occurring in various types of water is also shown in a graph.

(9538) DONNELLY, T.W., 1993. Impoundment of rivers: sediment regime and its effects on benthos. *Aquat. Conserv.* 3: 331-342. – (2091 Partridge Lane, Binghamton, NY 13903, USA).
A major effect of impoundment of rivers is the coarsening of the sediment. It is postulated that this may prevent burrowing benthos from finding suitable habitats and may thus severely diminish the respective fauna. In a very informative odon. section (pp. 333-334), this is shown on the example of the depleted gomphid fauna of the upper Delaware R., NY, USA.

(9539) FUJIMOTO, K., 1993. [Catching aeshnids as a children's culture]. *In*: K. Tanigawa, [Ed.], Doshokubutsu no folklore, Vol. 2, pp. 425-480, Sanichi Shobo, Tokyo. (Jap.). – (Author's address unknown).
A very comprehensive, illustrated "monograph" on the "*toriko*" and "*buri*" dragonfly catching tools and techniques, with descriptions and illustrations of local types as peculiar to various prefectures of Japan. – For some other publications on this subject cf. *OA* 9491.

(9540) GEISTER, I., 1993. Kačji pastirji. – [Dragonflies]. *In*: B. Štumberger, M. Kaligarič & I. Geister, Krajinski park Šturmovci, pp. 34-38, Občina Ptuj, Ptuj. – ISBN 961-90050-2-3. (Slovene). – (Pokopališka pot 13, SLO-64202 Naklo, Slovenia).
In a nature field guide for the Šturmovci Landscape Park nr Ptuj, S Styria, Slovenia, 26 spp. are briefly characterised and good col. portraits of some of them are added. – Cf. also *OA* 8908.

(9541) GEISTER, I., 1993. Odonatna favna Fiese trideset let kasneje. – La fauna Odonata di Fiesa trent'anni dopo [sic!]. *Annales, Koper/Capodistria* 3: 37-44. (Slovene, with Ital.s.). – (Pokopališka pot 13, SLO-64202 Naklo, Slovenia).
The 1989-1992 status of the odon. fauna of 2 man-made lakes at Fiesa (Fiessa) nr Piran (Pirano), NW Istria, Slovenia is compared with the assemblage as evidenced prior to 1962 (B. Kiauta, 1963, *Beitr. naturk. Forsch. SüdwDtl.* 22: 65-66). Out of the original 26 spp., 8 spp. were not encountered during the recent surveys, while 6 spp. could be added to the list. Changes in the composition and in ecological aspect of the fauna are mainly discussed in terms of the recent deterioration of habitat quality, and a set of balanced and clearly defined management measures is proposed. – Cf. also *OA* 9493.

(9542) HADRYS, H., 1993. *Comparative field and molecular genetic studies on intersexual male competition in selected odonate species*. PhD thesis, Techn. Univ. Braunschweig, Braunschweig. 80 pp. (With Germ.s.). – (Author's current address unknown).
[Verbatim summary]: Odon. provide some of the best known and most promising models to study mechanisms of sexual selection in polygamous mating systems. So far, however, knowledge on the adaptive significance of intrasexual male competition strategies has been severely limited. By conventional techniques, very few odon. spp. allowed to relate behavioral strategies to quantitative estimates of reproductive success. For case studies I have described the mechanisms and consequences of intrasexual male competition. By means of a state of the art DNA fingerprint technique I have related reproductive strategies to paternity success of unmanipulated males in the field. – So far insects have not been subjected to DNA fingerprint analyses for several reasons, including (i) lack of relevant sequence information, (ii) lack of species specific probes, (iii) limited availability of tissues, and/or (iv) large offspring clutches. I have developed the Random Polymorphic DNA (RAPD) technique as a general method for paternity determinations, which circumvents the limitations listed above. The identification and subsequent use of different suitable primers revealed statistical numbers of polymorphic RAPD markers. Possible amplification artifacts were compensated by using a "synthetic offspring" approach, which consists of equal amounts of both parental DNAs in the PCR reaction. Densitometric analyses of diagnostic RAPD markers allowed quantitative

estimates of mixed paternities within a range of 20-80% paternity success for one father. – In comparative field studies on different populations of Anax parthenope and A. junius I have (i) described patterns of intrasexual male competition, and (ii) quantified several parameters of aggressive male competition behavior under different socioecological conditions. Intrasexual male competition behavior in both, A. junius and A. parthenope, could culminate in the aggressive splitting of tandem pairs, which in some cases led to severe injuries or death of competing individuals. An existing morphological-ethological controversy on the significance of tandem guarding (assurance of immediate fertilization success or assurance of subsequent copulation success following oviposition) was resolved by paternity analysis via RAPD fingerprinting. The results suggest an immediate assurance of fertilization success for the tandemly guarding male. The application of RAPD fingerprinting to parentage analysis in A. parthenope is the first direct measure of paternity success in an unknown insect mating system. – Field studies on Orthetrum coerulescens have demonstrated high degrees of polygamous matings, correlated to the actual male density. Observations on individually marked males revealed variable copulation strategies. By means of paternity analyses, using field samples of families with recorded mating histories, sperm competition and mixed paternity offspring clutches were detected. Mixed paternities correlated with brief copulation times of the last male mate. This second application of RAPD fingerprinting has demonstrated the potential of the method for quantitative analyses of mixed paternity patterns and sperm competition mechanisms in a polygamous mating system.

(9543) HARRISON, S.J., 1993. *Variation in enzymatic mobility of anisopteran naiads exposed to sub-lethal concentrations of Cu^{2+}.* M.Sc. thesis, Towson St. Univ., Towson/MD. X+57 pp. – (Johns Hopkins Asthma & Allergy Cent., Rm 4B.72, 5501 Hopkins Bayview Circle, Baltimore, MS 21224-6821, USA).
[Verbatim]: Cupric ions (Cu^{2+}) may enter the environment at many sources: as industrial waste, urban runoff, or agricultural runoff. However in aquatic ecosystems copper enters most often in the form of $CuSO_4$, used primarily as an algacide. Non-target organisms exposed to copper sulfate may suffer deleterious effects. Otherwise healthy appearing organisms may actually be impaired. In this study, an electrophoretic analysis of various important metabolic enzymes in larval Anax junius and Erythemis simplicicollis was conducted to determine whether exposure to $CuSO_4$ causes variation in enzymatic mobilities, thus indicating the possibility that such impairments are occurring in natural populations of these (and similar) aquatic organisms.

(9544) HENRIKSON, B.-I., 1993. Sphagnum mosses as a microhabitat for invertebrates in acidified lakes and the colour adaptation and substrate preference in Leucorrhinia dubia (Odonata, Anisoptera). *Ecography* 16(2): 143-153. – (Dept Zool., Univ. Göteborg, Medicinargatan 18, S-41390 Göteborg).
The increase of peat mosses in acidified lakes leads to a changed microhabitat structure. Quantitative studies in the Lake Gardsjön catchment, SW Sweden, indicate a significant increase in the odon. abundance. – In a laboratory test, L. dubia late instar larvae were able to change colour to correspond to the brown and green colour of Sphagnum. In the field, the larvae were significantly more abundant in Sphagnum of their own colour. The ability of colour change is considered a protective adaptation against predators. – In Sphagnum substrate, L. dubia larvae are more successful predators on Aselus aquaticus than they are on debris.

(9545) JANETZKY, W. & E. VARESCHI, 1993. Bewertung von Fliessgewässern durch Makrozoobenthos. *Wasser Boden* 1993(8): 619-622. (With Engl.s.). – (AG Aquat. Ökol., Univ. Oldenburg, Postfach 2503, D-26015 Oldenburg).
A method of water quality assessment, based on evaluation of the gammarid and odon. fauna, is proposed. The analysis of the Hunte R. catchment is given as an example. 9 odon. spp. are listed; N Germany.

(9546) JEJČIČ, M., 1993. *Meritve velikosti in statistična pomembnost primerjave velikosti pri ličinkah vrste Aeshna cyanea (Müller, 1764) (Odonata: Anisoptera: Aeshnidae) v odvisnosti od*

spola. – [*Size measurements and statistical importance of the size, relative to the sex in the larval Aeshna cyanea (Müller, 1764) (Odonata: Anisoptera: Aeshnidae)*]. Seminarska naloga (Anim. Ecol.), Univ. Ljubljana. 7 pp. (graphs incl.). (Slovene). – (c/o M. Kotarac, Marohovih 11, SLO-62000 Maribor, Slovenia).
36 ♂ and 34 ♀ larvae, collected on 14-V-1993 from a pond nr Predmeja, Slovenia, were measured. Data for various parameters are stated. The difference in the total length (37.62 mm mean in ♂ and 34.21 mm in ♀) is statistically significant.

(9547) JOHANSSON, F., 1993. Effect of prey type, prey density and predator presence on behaviour and predation risk in a larval damselfly. *Oikos* 68: 481-489. – (Dept Anim. Ecol., Univ. Umeå, S-90187 Umeå).
For many animals feeding efficiency trades off against predator avoidance. In laboratory experiments, larval Coenagrion hastulatum changed their behaviour both when the larvae of Aeshna juncea were introduced, and in response to different prey treatments. The frequency of 5 "prey catching" behaviours was considerably lower in the presence of a predator when fast swimming Heterocope saliens copepods were used as prey, than, when sedentary Sida crystallina cladocerans were used. This is assumed a result of the low encounter rate with Sida prey. The more "general" behaviours, viz. walk, abdomen wave, scratch and turn, were performed less in the presence of the predator and both prey types. In contrast, the behaviours, rotate and swim, were performed at higher frequencies in the presence of a predator. Thus, these were interpreted as predator avoidance behaviours. The 3 densities of prey used in the experiments did not affect the frequency of the 11 different behaviours studied. Encounters of C. hastulatum with Sida prey increased when this prey coexisted with heterocope prey. This suggests that interference between the 2 prey makes Sida more vulnerable to predation. Number of position changes by C. hastulatum and predation on C. hastulatum by A. juncea was the same in presence of Heterocope, Sida, or no prey, but number of position changes increased if the predator was absent. This study shows that C. hastulatum larvae detect the presence of a potential predator and adjust their behaviour accordingly. Such behavioural adjustment could have considerable impact on a three-trophic level system.

(9548) JOHANSSON, F., 1993. *Effects of hunting behaviour on predator-prey interactions in a guild of odonate larvae*. PhD thesis, Univ. Umeå, 87 pp. – ISBN 91-7174-756-7. – (Author: Dept Anim. Ecol., Univ. Umeå, S-90187 Umeå).
In addition to the Prologue (p. 5), Summary (pp. 7-20) and the Epilogue (p. 87), the dissertation consists of the papers, listed in *OA* 7717, 8717, 8843, 9135, 9279 and 9547. – [Verbatim cumulative abstract]: The aim of this thesis was to study hunting behaviours in a guild of odon. larvae. The effects of prey density, prey characteristics, cannibalism and intraguild predation were considered. – Under diurnal conditions, late instar Cordulia aenea larvae used a sit and wait foraging mode, while Leucorrhinia dubia larvae used an active mode irrespective of prey density. Late instar Aeshna juncea and Coenagrion hastulatum larvae used a sit and wait mode when prey density was high, whereas an active mode was used if prey were absent. However, at night the tactile hunting C. aenea changed to an active mode, whereas visually the hunting A. juncea used a sit and wait mode. Tactile hunting C. hastulatum and L. dubia used a sit and wait and active mode, respectively, at night. – Experiments on the dichotomy of "slow" versus "fast" life style categories, showed that C. aenea fitted the slow whereas L. dubia fitted the fast life style category. – Estimates of field densities of larvae and predation by odon. on odon. suggested a high potential for odonate-odonate interactions. Laboratory studies showed that cannibalism and/or intraguild predation rates were generally low on sit and wait species and high on active species. However, cannibalism and intraguild predation were intense on small and low active C. aenea, suggesting that escape capability was very low in this species. Small A. juncea and L. dubia seemed to be able to estimate predation risk, since they lowered their activity in the presence of large A. juncea predators and zooplankton prey. This behaviour resulted in low predation. These odonate-odonate interactions should differ from those obtained in classical

predator-prey and competition theories. – Detailed observations of 11 behavioural variables in C. hastulatum showed that prey catching behaviours and activity which attracted predators, were reduced in the presence of an A. juncea predator. In contrast, behaviours associated with predator escape were performed at a higher frequency in the presence of the predator. The variability of behaviour shown by odon. larvae may have pronounced impact on multilevel trophic systems in ways that are different from the classical interactions usually studied.

(9549) KRÜNER, U., 1993. Die Libellenfauna, insbesondere die Kleinlibellenfauna eines Löschteiches im Naturschutzgebiet Lüsekamp/Boschbeektal, Kreis Viersen (Odonata). *Verh. westdt. Ent. Tag.* 1992: 137-144. – (Geldemer Str. 39, D-41189 Mönchengladbach).
Relates the record of a 10 yr systematic observation at a man-made pond, Viersen distr., Germany (23 spp.), with special reference to the local autochthony of the Zygoptera.

(9550) *LIBELLENNIEUWSBRIEF*, Nos 1-3 (1993). Published by the [Netherlands] Dragonfly Inventarisation Project, conducted by the "Nederlandse jeugdbond voor natuurstudie" (NJN), "Jeugdbond voor natuur en milieubescherming" (JNM) and by the "Nederlandse libellen onderzoekers" (NLO); financed by the Prins Bernard Foundation and by the WNF. (Dutch). – (c/o the Editor, V. Kalkman, v. Hogendorplaan 11, NL-1215 EG Hilversum).
The newsletter (A4 size, ca 8-12 pp. per issue) appears at irregular intervals, the issues are undated, the style is similar to that in other NJN publications, some articles are not signed. It mainly contains local records and brief field observations, some of appreciable local interest.

(9551) LUDWIG, C., 1993. Gomphus pulchellus Sélys in Stuttgart (Odon., Gomphidae). *Mitt. ent. Ver. Stuttgart* 28: 20. – (Obere Bismarck-str. 91, D-70197 Stuttgart).
2 individuals were sighted at Pfaffensee, 30-VI-1993. It is assumed, this is probably the first record of this sp. from the Stuttgart area, Germany.

(9552) LUNDE, V., 1993. Vanninsektenes betydning for sportsfiskere. – [Importance of aquatic insects for sport fishermen]. *Insekt-Nytt* 18(3/4): 9-12. (Norwegian). – (Zool. Mus., Sarsgt. 1, N-0562 Oslo).
Contains a reference to trouts preying on low flying Zygoptera and to a trout, the stomach of which was full of odon. larvae.

(9553) MAGALHÃES, M.F., 1993. Feeding of an Iberian stream cyprinid assemblage: seasonality of resource use in a highly variable environment. *Oecologia* 96: 253-260. – (Depto Zool. & Antrop., Fac. Cien. C2, Univ. Lisboa, PT-1700 Lisboa).
Food resource use by 7 cyprinid spp. in the Sorraia R. catchment, Portugal, was analysed over 9 months. The odon. are considered order-wise, and quantitative data on their representation in the fish diet during spring, summer and autumn are stated season-wise.

(9554) MOODY, D., 1993. Odonata records for northwest Ohio. *Ohio J. Sci.* 93(4): 109-110. – (Dept Biol., Univ. Findlay, Findlay, OH 45840, USA).
Ischnura kellicotti is for the first time recorded from Ohio (Mud Lake Bog Nature Preserve, Wiliams Co., 3-VII-1993). Additionally, 18 NW Ohio county records are given for 15 spp.

(9555) OH'HAMA, S., H. MISHIMA, S. SOTA & K. YODOE, 1993. *San'in no Tombo.* – [*Dragonflies of San'in*]. San'in Mishinokai (= Ent. Soc. of San'in), Matsue. 208 pp. [Nature Research Series, No. 1] – ISBN 4-87903-029-5. (Jap., with taxonomic nomenclature). – Price: ¥ 2000.- net. – (Publishers: San'in Chuo Shimposha, 6 F, 383 Tono-machi, Matsue, 690, JA).
This is a pocket-size monograph of the odon. fauna of the San'in district (= Tottori and Shimane prefectures), Japan. Each sp. is dealt with on 2 opposite pages (brief description, distribution map, phenology graph, 2-3 col. phots), and the spp. are dealt with in accordance with their habitats rather than in taxonomic sequence (viz. ponds, marshes and rice fields, rapid streams, slow running waters). Chapters on biology, a guide to the local habitats, a distribution tab., etc. conclude this attractive and useful book.

(9556) OLSVIK, H., 1993. Forslag til norske navn på øyenstikkere (Odonata). – [A proposal for Nor-

wegian dragonfly names (Odonata)]. *Insekt-Nytt* 18(3/4): 23-25. (Norwegian). – (N-6598 Foldfjorden).
Norwegian vernacular names are proposed for the 45 Norwegian spp., and the suggested appellations are briefly discussed.

(9557) PRENDERGAST, J.R., R.M. QUINN, J.H. LAWTON, B.C. EVERSHAM & D.W. GIBBONS, 1993. Rare species, the coincidence of diversity hotspots and conservation strategies. *Nature, Lond.* 365 (6444): 335-337. – (First Author: Biol. Records Centre, NERC Inst. Terrest. Ecol., Monks Wood, Abbots Ripton, Camrs, PE17 2LS, UK; – Third Author: NERC Centr. Pop. Biol., Imperial Coll. at Silwood Park, Ascot, Berks., SL5 7PY, UK).
Species conservation in situ requires networks of protected areas selected for high conservation interest. Throughout most of the world, however, there are neither the resources nor the time to carry out detailed inventories for most taxa before designating protected areas. Site selection (on grounds other than availability) would be easier and more effective if two things were true: (1) habitats that are species-rich for one taxon are also species-rich for others; and (2) rare spp. occur in, and therefore benefit from the conservation of, species-rich habitats. Diversity (usually, species richness) and the presence of rare spp. are the most frequently cited criteria for site selection by conservationists. Here, among others, data on British odon., held by the Biological Records Centre, are used, mapped on a grid of 10 km x 10 km to examine the extent to which species-rich areas for different taxa coincide, and whether species-rich areas contain substantial numbers of rare species. The fine scale and high intensity of recording in Britain produces distributional datasets at least as good as and, in most cases, better than those available elsewhere. For Britain at least, no strong support seems to exist for either proposition. Species-rich areas ('hotspots') frequently do not coincide for different taxa, and many rare spp. do not occur in the most species-rich squares.

(9558) RAAB, R., 1993. Beitrag zur Kenntnis der Libellenfauna des Pressegger Sees und anderer Gewässer des Gailtales (Kärnten) (Insecta: Odonata). *Carinthia* (II) 103: 443-452. (With Engl.s.). – (Anton-Brucknergasse 2/2, A-2232 Deutsch-Wagram).
10 spp. are recorded from the Pressegger Lake, and 8 spp. from 4 brooks and streams in the Gail R. Valley, Carinthia, Austria.

(9559) REDER, G., 1993. Erste Nachweise der Südlichen Mosaikjungfer (Aeshna affinis) und der Südlichen Heidelibelle (Sympetrum meridionale) in Rheinhessen (Insecta: Odonata). *Fauna Flora Rheinland-Pfalz* 7(1): 187-193. – (Am Pfortengarten 37, D-67592 Flörsheim-Dalsheim).
In Aug. 1992, several A. affinis and S. meridionale were sighted at a dried-up backwater bed of the Rhine R. (Ibersheimer Wert), Rhineland-Palatinate, Germany. The occurrence of the 2 spp. in Germany is briefly outlined.

(9560) RUNCK, C. & D.W. BLINN, 1993. Secondary production by Telebasis salva (Odonata) in a thermally constant aquatic ecosystem. *Jl N. Am. benthol. Soc.* 12(2): 136-147. – (First Author: Oak Ridge National Lab., Martin Marietta Energy Systems, P.O. Box 2008, Oak Ridge, TN 37813-6351, USA).
Annual production for T. salva (7.9 g dry weight [dw] m^{-2} yr^{-1}, ± 2 SE = 1.2) was found to be an order of magnitude higher in the thermally constant (21 ± 4°C) ecosystem of Montezuma Well, Arizona, than production for multi-species damselfly assemblages in other aquatic ecosystems. Telebasis salva was univoltine in Montezuma Well; larval development took 270.1 d in the laboratory (21°C). Both production (2.1 g dw m^{-2} yr^{-1}) and mortality (62.2%) were highest for individuals 2-3 mm in body length. Mean annual biomass was 0.78 g dw/m^2, annual $P/\bar{B}$ ratio was 10.0, cohort $P/\bar{B}$ was 7.5, and annual energy production for T. salva was 1.58 x 10^5 J m^{-2} yr^{-1}. Density, standing stock biomass, and production of T. salva were higher in the top 50 cm of the littoral water column than in the 50-100 cm stratum. Densities of a major prey (Hyalella montezuma, Amphipoda) and predator (Belostoma bakeri, Heteroptera) of T. salva nymphs were also estimated. Macroinvertebrate community production, trophic structure, and energy transfer in Montezuma Well are presented. Constant warm water temperature, abun-

dant food, absence of fish, and high predation by invertebrates contribute to the high production rates of T. salva in Montezuma Well.

(9561) RYAZANOVA, G.I. & G.A. MAZOKHIN-PORSHNYAKOV, 1993. Effects of the presence of fish on the spatial distribution of dragonfly larvae, Calopteryx splendens (Odonata). *Ent. Rev.* 72(7): 90-96. – (Dept. Ent., Fac. Biol., Lomonosov St. Univ., RUS-117234 Moscow).
The pattern of spatial distribution of C. splendens larvae was modified significantly by the presence of a predatory fish in the experimental tank. In the presence of the fish the larvae appeared less frequently in unprotected spaces without aquatic plants. This variation in behavior depended on many factors, and it is not quite clear what determines the degree of the variations. In particular, the modification of larval behavior depended on the time of day and on peculiarities of the predator and of the prey activity. The modification of the spatial distribution of larvae remained after the fish were removed from the tank. Protection behavior of the larvae was based on the hydrodynamic detection of the predator. Possible mechanisms of danger perception by the dragonfly larvae are discussed.

(9562) SCHMIDT, B., 1993. Die Siberische Winterlibelle (Odonata) im südwestlichen Alpenvorland. *Carolinea* 51: 83-92. (With Engl.s.). – (Büro f. Tierökol., Kohlenbacher Talstr. 18, D-79183 Waldkirch-Kollnau).
48 sites of Sympecma paedisca were investigated in SW Germany during 1987-1988 and 1991-1992, at alt. 369-704 m. The sp. is confined to the zone of silting up at lakes, ponds and marshland with litter meadows, and to troughs and depressions with periodically rising calcareous groundwater. Larval habitats are small, shallow pools or hollows, mostly involving Caricetum elatae with some Phragmites, Cladietum marisci, Caricetum elatae with some Phragmites, Cladietum marisci, Phalaridetum arundinaceae and other Magnocaricion-associations. Periodic fluctuations of the water level are characteristic: high water and aquiferous pools in summer, and low water in winter. Habitats for adults are extensively farmed Molinion-meadows with open vegetation structure and shrubs. S. paedisca populations perish if the Molinion-litter meadows disappear, even if there are still good habitats for larval development. The co-occurrence with S. fusca and the modes of competition avoidance between the 2 spp. are discussed. Normally they occupy different ecological niches. An exception are steep shores with a narrow zone of silting up, where interspecific competition can occur. Detailed habitat protective measures are proposed.

(9563) SIEGFRIED, B.D., 1993. Comparative toxicity of pyrethroid insecticides to terrestrial and aquatic insects. *Environ. Toxicol. Chem.* 12(9): 1683-1689. – (Dept Ent., 202 Plant Industry Bldg, Univ. Nebraska, Lincoln, NE 68583, USA).
The acute toxicities of 3 pyrethroid insecticides (permethrin, cypermethrin, bifenthrin) and 1 organophosphate insecticide (chlorpyrphos) were compared by topical application and static exposure to a variety of terrestrial and aquatic insects. Ephemeroptera and Zygoptera were the most susceptible groups tested by both exposure methods. The aquatic insects were generally more susceptible than the terrestrial insects when compared on a dose per body weight basis, although the differences were smaller than expected, given the extremely low concentrations that produce toxic effects by static exposure.

(9564) SPURIS, Z., 1993. *Latvijas spāru (Odonata) noteicējs. – [Identification guide for Latvian dragonflies (Odonata)]*. Zinātne, Riga. 65 pp. – ISBN 5-7966-0984-X. (Latvian). – (Author: Miera iela 19-6, LV-2169 Salaspils, Latvia).
A pocket-size, concise and sparsely illustrated, but well designed key for the adults of the 53 spp. of the Latvian fauna. In an appended chapter, habitat requirements are also stated for all the spp.

(9565) STENLØKK, J.A., 1993. Introduksjon til vanninsekter. – [Introduction to aquatic insects]. *Insekt-Nytt* 18(3/4): 3-6. (Norwegian). – (Hartmannvei 32c, N-0284 Oslo).
Contains a brief description of odon. life history, a reference to threatened spp., etc.

(9566) STENLØKK, J.A., 1993. Omtale av øyenstikker-utredning. *Insekt-Nytt* 18(3/4): 26. (Norwegian). – (Hartmannvei 32c, N-0284 Oslo).
A comprehensive review of the work listed in *OA* 9393.

(9567) SUGIMURA, M., 1993. *Tombo.* – [*Dragonflies*]. Kodansha, Tokyo. 48 pp. [Kodansha Panorama Iconograph Series No. 31] – ISBN 4-06-250032-9. (Jap.). – Price: ¥ 1200.- net.
Written for children, by the Director of the Shimanto Dragonfly Museum and Reserve, Nakamura. It deals with all aspects of biology, ecology, systematics and regional fauna of Japan. Of particular importance is a col. phot. of a gynandromorphic Chlorogomphus brunneus costalis, on p. 46.

(9568) VERNEAUX, V., J. VERNEAUX & A. GUYARD, 1993. Classification biologique des lacs jurassiens à l'aide d'une nouvelle méthode d'analyse des pouplements benthiques. II. Nature de la faune. *Annls Limnol.* 29(3/4): 383--393. (With Engl.s.). – (Lab. Hydro-biol., Inst. Sci. & Techn. Environ., Univ. Franche-Comté, Place Leclerc, F-25030 Besançon).
A sequel to the paper listed in *OA* 9181, but the odon. are considered only in passing.

(9569) [WATSON, J.A.L.] (Anonymous), 1993. An insect specialist of world repute. *Camberra Times*, issue of 23 Dec.
Obituary for Dr J.A.L. Watson, with the main data on his entomological career. For his bio data and for a concise statement on his manyfold services to odonatology cf. *OA* 9467. – Copies of the Final Salute addresses of 9 Dec. 1993, by *J. Cullen, M. Lenz* and *M. Whitten*, are available from SIO Central Office, Bilthoven. – For other obituaries, cf. *OA* 9577, 9596, 9601, 9611, 9617, 9618.

(9570) WIENEKE, U., 1993. *Untersuchung der Vegetation und Libellenfauna ausgewählter Hoch- und Übergangsmoore im Oberengadin.* DiplArb. Univ. Münster (Inst. Geogr.), Münster. vi+110 pp. – (Author: Dahlweg 17, D-48153 Münster).
This is a noteworthy, almost a monographic treatment of the odon. fauna (15 spp.) in the general St. Moritz-Maloja area, Upper Engadine, Switzerland. Cordulia aenea has not been previously known from Upper Engadine, but it has escaped the author's notice that Orthetrum coerulescens has been recorded from "Waldplätzen am Schafberge und im Rosegthale" more than a century ago by C.G. Giebel (1877, *Z. ges. Naturw. Halle* (III) 2(50): 164-219; record on p. 216). – Of particular interest are notes on species assemblages at various water bodies, and data on the mobility of individuals between the localities.

(9571) WISEMAN, S.W., S.D. COOPER & T.L. DUDLEY, 1993. The effects of trout on epibenthic odonate naiads in stream pools. *Freshw. Biol.* 30(1): 133-145. – (Dept Biol. Sci., Marine Sci. Inst., Univ. California, Santa Barbara, CA 93106, USA).
In a southern Californian stream Archilestes grandis larvae were much less abundant, moved less, exhibited fewer conspicuous behaviours, were more likely to occur in refuge areas, and had different diets in pools containing versus pools lacking rainbow trout (Oncorhynchus mykiss). To determine if trout were responsible for these patterns, trout was removed from some stream pools an added to pools lacking trout, with unmanipulated trout and troutless pools acting as controls. The abundance and emergence of A. grandis were drastically reduced, and the proportion of lestid populations in refuge areas greatly increased, when trout were added to pools; however, the removal of trout had less drastic effects on lestid abundance and distribution. Aeshna walkeri was also more abundant in pools lacking than in pools containing trout. Trout manipulations affected lestid behaviour, with swimming being observed only in troutless pools and movement tending to be greater in pools lacking rather than containing trout. One week after manipulations started, the number of prey items per lestid gut was higher in troutless control than in trout addition pools. Ostracods and chironomids were more abundant, and mayflies were less abundant, in the diets of lestids from pools lacking versus containing trout. Comparisons of the environmental abundances of prey taxa and lestid diet composition indicated that lestid selectivities for Caenis were higher, and those for Paraleptophlebia, ostracods, and Eubrianax lower, in

trout than in troutless pools. Although similar at the beginning of manipulations, head widths of lestids in troutless control pools were greater than those in trout addition pools after 3 weeks.

(9572) YUVAL, B. & A. BOUSKILA, 1993. Temporal dynamics of mating and predation in mosquito swarms. *Oecologia* 95(1): 65-69. – (First Author: Dept Ent., Fac. Agric., Hebrew Univ., P.O. Box 12, Rehovot 76-100, Israel).
In Sutter Co., California (July 15-Sept 23), the numbers of copulations and predatory attacks in swarms of Anopheles freeborni, and the distribution of these events throughout the duration of the swarming period each day were determined. On 19 evenings of observation, 2724 copulating pairs leaving swarms and 1351 Pantala hymenaea and Erythemis collocata attacks were recorded. Mating activity partially coincided with predator activity. Most copulations occurred between 10-20 min after the swarms formed, while predation events were most frequent during the initial 15 min of the swarm. The ratio of copulations to predatory attacks during the swarming period was calculated; it was significantly higher in an area sheltered by trees than it was in the open. It is suggested that physiological and ecological constraints other than predation operate on the mating system of this anopheline to affect the timing of swarm initiation and swarm site selection.

(9573) ZESSIN, W. & D. KÖNIGSTEDT, 1993. *Rote Liste der gefährdeten Libellen Mecklenburg-Vorpommerns.* (1. Fassung. Stand: Dezember 1992). Umweltminister Mecklenburg-Vorpommerns, Schwerin. 68 pp. – (First Author: Lübecker Str. 30, D-19053 Schwerin; – Publishers: Schlossstr. 6-8, D-19053 Schwerin).
This attractive booklet deviates very favourably from the traditional style and scope of similar publications. Small "monographs" are provided for all 60 regional spp., stating the general range (with a map), the regional status and that in the adjacent provinces and generally in Germany (tab.), habitat requirements, and the nature of threat(s), if any. Very useful is the checklist of 32 fossil spp. known from the province. A number of col. portraits and a comprehensive bibliography enhance the value of this highly informative publication.

1994

(9574) (Anonymous), 1994. Vuoden 1993 tulokset 21 suomalaisen hyönteislajin levinneisyyskartoituksesta. – Resultat av kartering av 21 insektarters utbredning i Finland ar 1993. *Baptria* 19(1): 17-30. (Finn. & Swed., with Engl.s.). – (c/o Div. Ent., Zool. Mus., Univ. Helsinki, P.O. Box 17, SF-00014 Helsinki).
Continuation of the series, last listed in *OA* 7262. Calopteryx virgo is the only odon. sp. considered; its abundance declined.

(9575) *ANAX, WIEN. Mitteilungsblatt der Osterreichischen Arbeitsgemeinschaft Libellen (ÖAL).* Vol. 1, No. 1 (March 10, 1994). (Germ., with Engl.s.). – Membership/subscription 1994: Ös 180.- net. – (c/o R. Raab, Anton-Bruckner-gasse 2/2, A-2232 Deutsch-Wagram).
Charter Meeting of the Austrian Odonatological Society (= "Österreichische Arbeitsgemeinschaft Libellen") has taken place in Vienna, on Oct. 16, 1993. The President and the Editor is Mr R. Raab (address above). The journal covers all disciplines of Odonatology and it is scheduled to appear in 1-3 issues annually. – C o n t e n t s: *Chovanec, A.*: Libellen als Bioindikatoren (pp. 1-9); – *Raab, R.*: Bibliographie zur Libellenfauna Osterreichs (pp. 10-23); – *Ehmann, H.*: Leucorrhinia rubicunda (Linne, 1758), Erstnachweis für Niederösterreich (Anisoptera: Libellulidae) (pp. 24-26); – *Raab, R.*: Bisherige Aktivitäten der ÖAL (pp. 27-29); – *Statuten des Vereines* "ÖAL - Österreichische Arbeitsgemeinschaft Libellen" (pp. 30-35); – *Neuerscheinungen/Publikationshinweise* (pp. 36-37); – *Raab, R.*: Veranstaltungskalender (p. 37); – *Raab, H.*: Noch immer ist der einzige österreichische Fundort der in ganz Mitteleuropa seltener Stylurus flavipes (Charpentier, 1825) in Gefahr (p. 38).

(9576) ARAI, Y., 1994. Do larvae of a dragonfly, Stylogomphus suzukii, migrate downstream? (III). *Gekkan-Mushi* 276: 22-26. (Jap., with Engl. title). – (1233-2 Sueno, Yorii-machi, Osato-gun, Saitama, 369-12, JA).
[Abstract not available]. – For the previous 2 papers on this subject cf. *OA* 7707, 9243.

(9577) *ARGIA. The news journal of the dragonfly so-*

ciety of America, Vol. 5, No. 4 (March 15, 1994). – (c/o Dr & Mrs T.W. Donnelly, 2091 Partridge Lane, Binghamton, NY 13903, USA). *Garrison, R.W.*: Leonora K. Gloyd – a reminiscence (pp. 2-3); – *Donnelly, N.*: Tony Watson – a brief appreciation (pp. 3-4); – Back to Fiji (pp. 4-6); – *Cook, C.*: A novel technique for collecting aquatic invertebrates (with particular application to Odonata nymphs) (pp. 6-8); – Over the trails searching for gomphids, 1. Renewing half-century old memories (pp. 8-9); – The International Scientific Collectors Association (pp. 9-10); – *Barber, B. & V. Elia*: Tholymis citrina: a recent record from Florida and an historical record from Texas (pp. 10-11); – *Barlow, A.E.*: Propsal for pre- and/or post-meeting trips: 1994 Northeastern Field Meeting, 11-12 June 1994 (pp. 12-13); – *Garrison, R.W.*: Paper on the Odonata of Arizona (p. 13); – *Cook, C.*: Literature reviews (pp. 13-14). – The issue also contains anonymous notes on 3 forthcoming 1994 DSA field meetings (pp. 11-12).

(9578) *ARRÊTÉ* du 22 juillet 1993 relatif à la liste des Insectes protégés en région Ile-de-France complétant la liste nationale. 1994. *Insectes, Opie* 92(1): 9-10.
In the Ile-de-France region, France, all ontogenetic stages (but not their habitats) of the following spp. are legally protected: Lestes dryas, Ischnura pumilio, Coenagrion hastulatum, C. scitulum, Boyeria irene, Aeshna grandis, Cordulegaster boltonii, Epitheca bimaculata, Sympetrum danae, S. flaveolum and Leucorrhinia rubicunda. – Cf. also *OA* 9164.

(9579) BRÄNDLE, M. & M.-O. RÖDEL, 1994. Beiträge zur Faunistik und Ökologie der Libellen der Iberischen Halbinsel (Insecta: Odonata). *Ent. Z., Essen* 104(8): 145-156. (With Engl.s.). – (Second Author: Kirschenweg 1, D-88048 Friedrichshafen).
During 3 field trips, data on 37 spp. were collected at 17 localities/broader areas throughout Spain and Portugal. Among the notable records are Lestes macrostigma, Coenagrion scitulum, Aeshna cyanea, A. juncea, Anaciaeschna isosceles, Orthetrum chrysostigma, Brachythemis leucosticta, Trithemis annulata, etc. The localities are briefly described and the records discussed.

(9580) BRÄNDLE, M. & M.-O. RÖDEL, 1994. Libellenfunde von Nordgriechenland und Kreta (Odonata). *Ent. Z., Essen* 104(5): 85-91. (With Engl.s.). – (First Author: Parlenstr. 12, D-72768 Reutlingen).
During 4 field trips, 29 spp. were recorded from northern Greece (Macedonia, Thracia) and from the island of Crete. Noteworthy are the records of Sympecma fusca (Crete), Enallagma cyathigerum (new for Crete), Cetriagrion tenellum (co-occurring with the latter), Brachytron pratense (Prespa), and Libellula quadrimaculata (Prespa).

(9581) BUCHWALD, R., 1994. Experimentelle Untersuchungen zu Habitatselektion und Biotopbindung bei Ceriagrion tenellum De Villers, 1789 (Coenagrionidae, Odonata). *Zool. Jb. Syst.* 121(1): 71-98. (With Engl.s.). – (Inst. Biol. II/Geobotanik, Univ. Freiburg, Schänzlestr. 1, D-79104 Freiburg/Br.).
In SW Germany, C. tenellum occurs almost exclusively in calcareous spring mires with pools and in calcareous spring lakes. Transplantations of larvae confirmed that several factors are indispensable for the completion of larval development (all-year discharge, O_2 concentration over 2.5 mg/l, high water temperatures in summer, absence or lack of ice cover in winter, bog lime or submersed vegetation as larval habitat). These, combined with the exclusive occurrence in summer-warm and rather winter-mild regions, might consitute the biotope preference at the border of the distribution area. The results indicate the great significance of the breeding site fidelity in the western region of the Lake Constance. Normally C. tenellum does not show any tendency to leave the breeding waters and to disperse. Transplantation and selection experiments demonstrated that the sp. has a narrow ecoscheme whose decisive elements are apparently vegetation and structure of the water. Possibly it is able to discern some plant spp. growing in small stands. From the very small rate of recovery in artificial waters can be concluded that the natural (landscape) scenery – particularly the areas adjacent to the breeding waters – represents an important sign in the habitat selection. Probably the habitat selection

takes place in a 4-step mechanism, the single phase being characterized by a differently high selectivity. Regarding their evolutionary significance, breeding site fidelity and narrow ecoscheme are discussed in detail.

(9582) *BULLETIN OF AMERICAN ODONATOLOGY*, Vol. 2, No. 1 (March 1994), No. 2 (March 1994). – (c/o Dr. T.W. Donnelly, 2091 Partridge Lane, Binghamton, NY 13906, USA).
No. 1: *Novelo-Gutiérrez, R.*: La nayade de Archilestes latialatys Donnelly, 1981 (Zygoptera: Lestidae) (pp. 1-7); – *Ramirez, A.*: Descripción e historia natural de las larvas de odonatos de Costa Rica. III. Gynacantha tibiata (Karsch, 1891) (Anisoptera: Aeshnidae) (pp. 9-14); – No. 2: *Tennessen, K.J.*: Description of the nymph of Epitheca (Tetragoneuria) spinosa (Hagen) (Odonata: Corduliidae) (pp. 15-19); – *Daigle, J.J.*: The larva and adult male of Somatochlora georgiana Walker (Odonata: Corduliidae) (pp. 21-26).

(9583) CARLE, F.L. & J.A. LOUTON, 1994. The larva of Neopetalia punctata and establishment of Austropetaliidae fam. nov. (Odonata). *Proc. ent. Soc. Wash.* 96(1): 147-155. – (First Author: 146 Mountain View Rd, Warren, NJ 07059, USA).
The larva of N. punctata is described and the Neopetaliidae transferred to the Libelluloidea (sensu Carle 1986). The Austropetaliidae fam.n. (type genus: Austropetalia Tillyard) is established for the remaining spp. formerly placed in Neopetaliidae, and Austropetaliidae fam.n. placed within the Aeshnoidea (sensu Carle 1986). Keys to the superfamilies and families of anisopteran adults and larvae are provided, and comments on biology and distribution are included.

(9584) *CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS – [Newsletter of the Netherlands Dragonfly Workers]*, No. 22 (March 1994). (Dutch). – (c/o M.T. Wasscher, Minstraat 15 bis, NL-3582 CA Utrecht).
In addition to the traditional management communications, the issue mainly contains various, comprehensive book reviews (*M. Wasscher, D. Tempelman, R. Ketelaar*: pp. 2-11). Signed articles: *Wasscher, M.*: Range expansion of Sympetrum pedemontanum in NE Europe during 1953-1985 (pp. 11-15); – Assessment of the 1993 dragonfly season in the Netherlands (pp. 15-17); – *Storm, B.*: Noteworthy 1993 dragonfly records in the Netherlands (pp. 17-20).

(9585) CORDERO, A., 1994. El santuario de las venerables libélulas de Shimanto. *Natura, Madrid* 132 (March): 38 & 51. – (Ecoloxia, E.U. Enxeniria Técnica, Univ. Vigo, Avda Buenos Aires s/n, ES-36002 Pontevedra, Galicia).
A nicely illustrated informative article on the Shimanto Dragonfly Museum and reserve, Nakamura, Shikoku pref., Japan. – Cf. also *OA* 7424.

(9586) D'ANTONIO, C., 1994. Riperti. Odonata: Lestidae, Aeshnidae. *Boll. Ass. romana Ent.* 48: 113-114. – (Via A. Falcone 386/b, I-80127 Napoli).
Boyeria irene and Aeshna mixta are reported from the Basilicata region, and Chalcolestes viridis parvidens also from Lazio. The latter is of particular interest, since its occurrence in Italy was only recently discovered.

(9587) DELL'ANNA, L., 1994. Riperti. Odonata: Coenagrionidae, Aeshnidae, Libellulidae. *Boll. Ass. romana Ent.* 48: 114. – (Dipto Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma).
Cercion lindenii, Anax parthenope, Crocothemis erythraea and Orthetrum brunneum are for the first time recorded from Molise, Italy.

(9588) DI DOMENICO, M. & G. CARCHINI, 1994. Odonata of Lake Ventina, Lazio, with records of two new species for central Italy. *Opusc. zool. flumin.* 119: 1-11. – (Dipto Biol., Univ. Roma "Tor Vergata", Via della Ricerca Scientifica, I-00133 Roma).
The odon. fauna (28 spp.) of the small Lake Ventina, Rieti prov., alt. 365 m, was explored between Apr. 1990 and June 1993. Erythromma najas and Cordulia aenea were not previously recorded from central Italy. In comparison with the odon. assemblages of 2 other sites in central and southern Italy, the prevalence of the "invasional" taxa (sensu D. St. Quentin, 1960, *Zool. Jb. Syst.* 87: 301-316) in the Ventina odon. community is peculiar. – (*Abstracter's Note*: This

was the site of one of the Field Trips during the 11th Int. Symp. Odonatol., 1991).

(9589) EDA, S., 1994. Annual review on entomology for 1993 in particular insect groups. Dragonflies. *Gekkan-Mushi* 277: 28-33. (Jap., with Engl. title). – (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
Sequel in the series, the last paper of which is listed in *OA* 8993.

(9590) EDA, S., 1994. Chronicle of Japanese odonatology in 1993, with supplemental notes of 1992. *Nature & Insects* 29(3): 25-33. (Jap., with Engl. title). – (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
Sequel in the series, the last paper of which is listed in *OA* 8994.

(9591) EDA, S., 1994. Dragonflies on paper money, and on a coin. *Gekkan-Mushi* 278: 24-27. (Jap., with Engl. title). – (3-4-25, Sawamura, Matsumoto, Nagano, 390, JA).
Includes 17 phots; an abstract is not available.

(9592) FOX, A.D. & S.A. CHAM, 1994. Status, habitat use and conservation of the Scarce Blue-tailed Damselfly Ischnura pumilio (Charpentier) (Odonata: Coenagrionidae) in Britain and Ireland. *Biol. Conserv.* 68: 115-122. – (Second Author: 45 Weltmore Rd, Luton, Bedfords., LU3 2TN, UK).
The status and distribution of I. pumilio in Britain and Ireland are reviewed from a national mapping survey. Although the sp. is now extinct from parts of East Anglia (where it was recorded early this century) and has experienced recent declines in the New Forest area, information suggests that it is perhaps as common now as it ever has been. It is well established in valley mires, floodlands and other natural wetlands, particularly in western Britain. In recent decades, it has been reported increasingly from artificial wetlands such as those created by mineral extraction, newly created ponds and ditches. Colonies at artificial wetlands tend to be more transient, associated with the early stages of plant seral succession. Disturbance to such habitats which perpetuates bare substrates and openness of vegetation appears to sustain the insect at such sites. Despite apparent differences between natural and artificial sites, the microhabitats favoured by this highly dispersive damselfly are similar throughout its range. Suitable management prescriptions are discussed for its effective conservation.

(9593) FRICKHINGER, K.A., 1994. Die Winterlibelle. *T[errarium] I[nternational] Mag.* 118: 46-49. – (c/o Tetra Verlag, Postfach 1580, D-49304 Melle).
Gives a detailed description and a photographic record of Sympecma fusca emergence in aquarium. It commenced at 03 h a.m. when the larva had taken its position on the support, and it was completed in about 2 h, with the wing expansion of the adult.

(9594) GLOTZHOBER, R.C., 1994. Mule killers and other surprises: the dragonfly. *Timeline* 11(2): 42-49. – (Ohio Hist. Soc., 1982 Velma Ave., Columbus, OH 43211-2497, USA).
A beautifully illustrated, very readable general article on dragonflies, containing, among other highly relevant information, also a reference to the 1993 Ohio reports on "half-dozen instances of masses of dragonflies in non-directional feeding frenzies. Some of these were small swarms, but 2 reports were of 'hundreds' and 2 others of 'thousands' of individuals".

(9595) *GOMPHUS. Mededelingsblad van de belgische libellenonderzoekers. – Bulletin de liaison des odonatologues belges*, Vol. 9, No. 4 (March 1994). (Dutch & Fr.). – (c/o A. Anselin, E. Poetoustraat 13, B-9030 Mariakerke).
Anselin, A./P. Goffart: [Editorial] (pp. 89-90); – *Tailly, M. & Y. Baptiste*: [Dragonflies of the Blankaart at Weumen (W-VI)] (pp. 91-93); – *Percsy, O. & N. Percsy*: La colonisation d'une mare artificielle du Brabant Wallon par les odonates: bilan des cinq premières années de suivi (pp. 94-103); – *Anselin, A.*: [First results of the 1993 dragonfly inventarisation in Flanders] (pp. 104-113). – A book review (by M. Tailly; pp. 114-115) and 2 announcements conclude the issue.

(9596) *HAGENIA. Mitteilungsblatt des Nationalen Büros der SIO in der Bundesrepublik Deutschland und der GdO*, No. 7 (March 1, 1994). Edited by M. Schorr & U. Krüner. – (Subscrip-

tion orders outside Germany to the SIO Central Office, Bilthoven).
Under the standard section headings, "*S.I.O.*", "*Internationales*", "*GdO*", "*Termine*", "*Kooperation*", "*Literatur*", "*Bestellen und Kaufen*", "*Buchbesprechungen*" and "*Verschiedenes*", the issue is bringing, on 14 pp., more than 20 informative articles and notifications. *M. Schorr* writes an obituary for the late Tony [J.A.L.] Watson (p. 1). *M. Kotarac* presents final details on the 1st Odonatological Symposium of the Alps-Adriatic Regional Community (pp. 1-2), *A. Pedroli-Christen* reports on the 6th Swiss Symposium (p. 2; cf. *OA* 9430), and *R. Raab* has contributed a brief report on Charter Meeting of the Austrian Odonatol. Society (Oct. 16, 1993) and its periodical, *Anax, Wien* (p. 2; address: R. Raab, Anton-Brucknergasse 2/2, A-2232 Deutsch-Wagram). – Some of the other signed articles: *Lohmann, H.*: Geplant: Libellenfauna von Griechenland (pp. 4-5, 12); – *Fliedner, H.*: Erfassungsprogramm für Erythromma viridulum (pp. 8, 13); – *M. S[chorr]*: Libellen und Musik, V (pp. 9, 14), etc. – L a y - i n (circulated to all addresses in the countries of central Europe) presents *M. Schorr*'s comments on the Johnson-Corbet-Pritchard circular as listed in *OA* 9471.

(9597) INOUE, K., 1994. "*Dragonfly Kingdom" in Nakamura, Japan.* Japan Branch SIO, Osaka. 2 pp. – (5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
This is a stencil for informal circulation to the overseas SIO membership. It gives a concise history, and a brief outline of the set-up, operation and perspectives of the Shimanto Dragonfly Museum and Sanctuary, in Nakamura, Kochi pref., Japan. The institution is operated by the corporation, "Tombo to shizen wo kangaerukai", headed by M. Sugimura, and is publishing a bimonthly, "*Tombo to Bunka*" (= "Dragonflies and Culture"). In March, 1994, the corporation had 1447 Japanese and 23 foreign members.

(9598) ISHIDA, K., 1994. Planaeschna naica, a new species of dragonfly from Amami-ôshima, Ryûkyû Islands (Odonata: Aeshnidae). *Trans. Shikoku ent. Soc.* 20(3/4): 161-170. – (Zool. Lab., Fac. Agric., Meijo Univ., Tempaku-ku, Nagoya, 468, JA).
The adult and ultimate instar larva of the new sp. are described, illustrated and compared with P. milnei. Holotype ♂: Fureai-no-mori, Uken-son, Amami-ôshima, Japan, 2-VIII-1988; deposited at Ent. Lab., Ehime Univ., Japan; numerous paratypes of both sexes.

(9599) *JOURNAL OF THE BRITISH DRAGONFLY SOCIETY*, Vol. 10, No. 1 (Apr. 1994). – (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).
Jenkins, D.K.: A population study of Coenagrion mercuriale (Charpentier) at a New Forest site. 5. Temperature and pH (pp. 1-5); – *Brownett, A.*: Resource partitioning in the genus Calopteryx: an unsolved problem of odonatology (pp. 6-11); – *Benstead, P.J.*: Observations on Sympetrum danae (Sulzer) away from breeding areas (pp. 11-12); – *Winsland, D.C.*: Observations on the current status of some of the scarce Odonata of vice-county 11 (pp. 12-16); – *Brooks, S.J.*: How much does acidity affect the distribution of 'acidophilic' dragonflies? (pp. 16-18); – *Goodyear, K.G.*: Gomphus vulgatissimus (Linnaeus) in Oxfordshire and Hampshire (pp. 19-20); – *Paine, A.*: Notes and observations (pp. 20-23); – *Clarke, D.*: Book review [of the volume listed in *OA* 9435] (p. 24).

(9600) KETELAAR, R. & M. WASSCHER, 1994. *Libellenprojekt: inventarisatie van libellen in Nederland.* – [*Dragonfly project: inventarisation of dragonflies in the Netherlands*]. NJN, Deventer & JNM, Utrecht. 8 pp. (Dutch). – (Available free from: NJN, Bokkingshang 1, NL-7411 GG Deventer, or JNM, Oudegracht 42, NL-3511 AR Utrecht).
A multicolour pamphlet, describing the objectives of the project and appealing for the cooperation of amateur dragonfly watchers. Technical details are outlined in the publication listed in *OA* 9284.

(9601) *KIMMINSIA. Newsletter of the U.K. National Office of the International Odonatological Society (SIO).* Vol. 5, No. 1 (May 1, 1994). – (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).
The issue is dedicated to the memory of Dr J.A.L. Watson. – Signed articles: *Corbet, P.*:

Tony Watson – a tribute (pp. 1-2); – *Endersby, J.*: Drargonflies as hosts to parasitic mites (p. 4); – *Mason, J.*: Petalurid hunting in New Zealand (pp. 4-5); – *Andress, R.*: An Australian sojourn: 16 December 93 – 6 January 94 (pp. 5-6); – *Richards, S. & R. Rowe*: Australian dragonfly research; northern Queensland (pp. 7-8); – *Silsby, J.*: Special moments in Australia (p. 8).

(9602) *La LETTRE DES SOCIÉTAIRES* [of the Société Française d'Odonatologie], No. 1 (March 25, 1994). – (c/o J.-L. Dommanget, 7 rue Lamartine, F-78390 Bois-d'Arcy).
Edited by J.-L. Dommanget, this is the newsletter of the French Odonatological Society (SFO). It is to appear at irregular intervals, at least 1 issue annually, and is to serve as a vehicle for communication of announcements, management news, reports on meetings, etc. Among the numerous highly relevant items, the first issue contains also the pricelist of the library xerox service, as operated by the SFO (1-10 copies: FF 30.- for members, FF 100.- for non-members; each additional copy: FF 1.- or FF 2.-, resp.; postage and VAT extra).

(9603) *LIBELLULA. Mitteilungsblatt der Gesellschaft deutschsprachiger Odonatologen (GdO)*, Vol. 12, No. 3/4 (March 1994). – (c/o Mrs U. Krüner, Gelderner Str. 39, D-41189 Mönchengladbach).
Ott, J.: Vorwort (p. i); – *Corbet, P.S.*: Are Odonata useful as bioindicators? (pp. 91-102); – *Dévai, G. & M. Miskolczi*: Die Ergebnisse der Libellenerfassung in einem UTM-Rasterquadrat in Ungarn (ET 56, NO-Ungarn, 1989) (pp. 103-118); – *Ott, J.*: Zum Stand des Libellenschutzes in Deutschland: Ergebnisse einer aktuellen bundesweiten Umfrage (pp. 119-138); – *Trockur, B.*: Erste Ergebnisse von Untersuchungen zum Epitheca-Vorkommen im Saarland (Anisoptera: Corduliidae) (pp 139-151); – *Müller, O.*: Phänologie von Gomphus vulgatissimus (L.), Gomphus flavipes (Charpentier) und Ophiogomphus cecilia (Fourcroy) in der Mittleren Stromoder (Anisoptera: Gomphidae) (pp. 153-159); – Zum Beutefangverhalten der Larven von Ophiogomphus cecilia (Fourcroy), Gomphus flavipes (Charpentier) und Gomphus vulgatissimus (Linné) (pp. 161-173); – *Schmidt, E.*: Die ökologische Nische von Sympetrum depressiusculum (Selys) im Münsterland (Naturschutzgebiet Heubachwiesen) (pp. 175-198); – *Stuckas, H.*: Die Libellenfauna des Landkreises Bad Liebenwerda (pp. 199-223); – *Böcker, L.*: Grössenspezifische Verteilung der larven von Cordulegaster boltoni (Donovan) und C. bidentatus (Selys) über den Bachlauf: Untersuchungen an allo- und sympatrischen Bächen im Giessener Raum (pp. 225-247); – *Gerken, B. & M. Wienhöfer*: Biozönologische Betrachtungen an Libellen einer französischen Flussaue im Rahmen eines tierökologischen Geländepraktikums (pp. 249-267); – *Wildermuth, H.*: Populationsbiologie von Leucorrhinia pectoralis (Charpentier) (Anisoptera: Libellulidae) (pp. 269-275); – *Heitz, S.*: Neufunde von Gomphus simillimus (Selys) am Hochrhein (BRD) (pp. 277-280).

(9604) LOPAU, W., 1994. *Die Libellenfauna der Insel Lesbos/Gr.* Lopau, Gnarrenburg. 80 pp. – (Kuhstedtermoor 26, D-27442 Gnarrenburg).
This is a revised and updated edition of the work listed in *OA* 8370. 34 spp., from 87 localities, are listed and their distribution is mapped. Various field notes and habitat descriptions are particularly valuable.

(9605) MATSUKI, K., 1994. The dragonfly Libellula angelina designated as a protected species. *Nature & Insects* 29(5): 33-35. (Jap., with Engl.s.). – (Hasama-cho 3-1575-14, Funabashi-shi, Chiba, 274, JA).
[Abstract not available].

(9606) MILLER, P.L., 1994. The responses of rectal pumping in some zygopteran larvae (Odonata) to oxygen and ion availability. *J. Insect Physiol.* 40(4): 333-339. – (Dept Zool., Univ. Oxford, South Parks Rd, Oxford, OX1 3PS, UK).
Rectal pumping movements have been observed to occur infrequently in larvae of Ischnura elegans and Enallagma cyathigerum, when kept in river water. However pumping became regular with a mean cycle duration of 6.8 ± 1.9 s (SE) after larvae were kept for 2-3 days in distilled water, whereas in 100 mM/l NaCl it usually ceased altogether. Oxygen lack caused larvae to perform short bursts of lateral abdominal wagging movements and then to approach the

surface, but it had no effect on rectal pumping in these species. In contrast the frequency and amplitude of pumping in Calopteryx splendens were much increased by oxygen lack, though not by carbon dioxide excess, and pumping was also found to be responsive to the ion availability. By keeping larvae in solutions containing 0, 10, 100 and 200 mM NaCl/l, and making them hypoxic or hyperoxic, the responses to oxygen and ion levels in the medium were separately examined. The differences in the responsiveness of these species are discussed in terms of possible environmental adaptations.

(9607) *NEWSLETTER [OF THE] BRITISH DRAGONFLY SOCIETY*, No. 25 (Spring, 1994). – (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR8 4AG, UK).
On 12 pp., the issue contains 23 sections, plus the now traditional "Junior section" (by *M. Parr & M. Parr*) and a questionnaire on the "Members opinions" (pp. 11-12). – R. Askew & B. Harley are the current JBDS Editors. The Society has 26 local groups. Among the policy aims is the intention to rely on natural growth rather than seeking to increase numbers by large-scale Membership Drive. Rather than attempting to lounch large fund-rising appeals, the BDS is to rely on donations from the members. – Life membership is available at £ 80.-, payable in 4 yearly instalments.

(9608) RAHMEL, U. & A. RUF, 1994. Eine Feldmethode zum Nachweis von anthropogenem Stress auf natürliche Tierpopulationen: "Fluctuating Asymmetry". *Natur Landschaft* 69(3): 104--107. (With Engl.s.). – (Second Author: AG Ökosystemforsch. & Bodenökol., Univ. Bremen, D-28334 Bremen).
The article introduces a method of assessing the conditions of natural populations. Fluctuating Asymmetry in populations is used as a sensitive monitoring system of the effects of anthropogenic disturbance. In an assumed pollution gradient, populations of two species were sampled and analyzed. The source of stress was a fertilizer manufacturing plant near Ilmensee (Russia). The species considered were ants (Lasius niger) and dragonflies (Coenagrion puella). Both species seemed to have fixed characteristics but others clearly showed an impact of increased pollution levels in the degree of asymmetry in populations. Populations closer to the plant facility have a higher asymmetry level in their characteristics than the more distant ones. The analysis of Fluctuating Asymmetry has proved to be a useful tool in detecting environmental stress. Other fields of application are proposed.

(9609) REEVES, D., 1994. Odonata (dragonflies) from "Heathlands" Cape York Peninsula, 10th-23rd March, 1992. *Myrmecia* 30(1): 6-9. – (10 Janet Cl., Capalaba, Qld 4157, AU).
A commented list of 37 spp., from 13 sites, from the extreme NE point of Australia. Of these, Nannophya australis and Trapezostigma propinqua were not cited from the region by J.A.L. Watson (1974, *J. Aust. ent. Soc.* 13: 137--149), though they are listed from Cape York Peninsula by M.A. Lieftinck (1951, *Am. Mus. Novit.* 1488: 1-46).

(9610) SCHOT, J. & P. VERDONSCHOT, 1994. Standaard voorschrift voor determinatie libellenlarven. – [Suggestions for a standard procedure in the identification of dragonfly larvae]. *NieuwsBr. WerkGr. Ecol. Waterbeheer* 19: 11--17. (Dutch). – (Dept Aquatic Ecol., IBN, P.O. Box 23, NL-6700 AA Wageningen).
20 most commonly used works for identification of the Netherlands odon. larvae are critically analysed, and in a species-wise review the titles, containing the optimal distinguishing characters for identification of a certain sp. or species-group, are marked. – This very carefully prepared work will be certainly of very much help to those not familiar with all the details and peculiarities of the current, very substantial literature in this field.

(9611) *SIOJA*. [Information bulletin of the SIO Japan Branch Office], Osaka, 1994, No. 1 (Feb. 25, 1994). (Jap.). – (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
[In 1993 only 1 issue was published]. – On 4 pp., the present issue contains a brief obituary for Dr J.A.L. Watson (cf. e.g. *OA* 9467), by *K. Inoue* (p. 4); the rest of the bulletin is devoted to a response to the critical Johnson-Corbet--Pritchard *Selysia* circular, as listed in *OA* 9471. An almost unabridged translation of the original text is followed by a concise and detailed outline

of the factual background evidence, concluded by Dr *S. Asahina* and *K. Inoue* statements of encouragement to the present SIO management. The translation of K. Inoue's personal communication of 20 Feb. 1994 to B. Kiauta is added, and an appeal is made to the SIO Japan Branch membership to get in touch with the latter. – (For the response of the SIO National Office in Germany cf. *OA* 9596).

(9612) *SYMPETRUM, GRENOBLE. Revue d'odonatologie*, No. 7 (1994). – (c/o C. Deliry, G.R.P.L.S., 97 rue St. Laurent, F-38000 Grenoble).
D[eliry], C.: Editorial (p. 3); – *Zannoni, C.*: Vous avez dit fragile une libellule? (pp. 5-7); – *Grand, D.*: Première rencontre avec Paragomphus genei (Sélys, 1841) et Orthetrum trinacria (Sélys, 1841) en Sardaigne (pp. 9-22); – *Zannoni, C.*: Prospection en eau trouble (pp. 23-25); – *Deliry, C.* [Ed.]: Impact des aménagements de pays de montagne sur des zones humides de petite taille (pp. 27-48); – *Zannoni, C.*: Trois L pour une libellule (pp. 49-51); – *Deliry, C.*: Observation de Coenagrion coerulescens (Fonscolombe, 1838) dans le département du Tarn (81) (Zygoptera: Coenagrionidae) (pp. 53-59); – *D[eliry], C.*: Publications notables (p. 62); – *Publications du G.R.P.L.S.* depuis le *Sympetrum* No. 6 (p. 64).

(9613) *SYMPETRUM HYOGO*, Vol. 2 (Feb. 20, 1994). Published by the Hyogo Society of Odonatology, Kobe. Edited by S. Nishu (247, Shonomoto, Gunge, Mikage-cho, Hagashinada-ku, Kobe, 658, JA). (Jap., with Engl. titles). – (Distribution outside Japan: K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA). [This is the 2nd vol. of the periodical as listed in *OA* 9025]. – *Nishu, S.*: The name of this journal changed (p. 2); – Report of the survey trip of the Hyogo Society of Odonatology (1), 1993 (pp. 2-5); – *Fujimoto, K.*: Stylurus nagoyanus first caught in Hyogo prefecture (p. 6); – *Nishu, S.*: Report of the survey trip of the Hyogo Society of Odonatology (2), 1993 (pp. 6-7); – *Inoue, K.*: A preliminary note on the starvation duration of dragonflies (pp. 8-12; with Engl.s.); – *Nishu, S.*: A preliminary note on the distribution of Mortonagrion hirosei in Hyogo prefecture (pp. 13-15); – Comments on the photograph of the cover page (p. 16; Calopteryx japonica); – Postscript (p. 16).

(9614) THOMPSON, D.J. & B. KIAUTA, 1994. Odonatospeleology: dragonflies in caves, with a checklist of the known records (Odonata). *Opusc. zool. flumin.* 118: 1-10. – (First Author: Dept Environ. & Evol. Biol., Univ. Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK).
The available records from caves and similar hypogean (other than interstitial) habitats, referable to 34 identified spp., are reviewed, incl. some that are published here for the first time. 17 spp. come from the cenotes of Yucatan, the others mainly from natural caves in Australia, Austria, Cameroon, Canada, Hungary, Italy, Mexico, New Zealand, Romania, Slovenia, Switzerland and the United States. Most dragonflies in hypogean habitats are accidentals, washed in from surface streams, either as eggs or as larvae. However, once in caves, several spp. are able to survive for long periods and even emerge successfully. Indolestes obiri and Gynacantha nourlangie are regularly associated with caves, and the latter has been known to breed there. The ability of Somatochlora meridionalis to colonize cave habitats has been associated with the seasonal drying up of surface waters. Some speculations as to the ecological features of the likely 'candidates' to add to the current scarcity of odon. cave records are offered.

(9615) VELTE, F., 1994. Ein Fund von Lestes virens (Charp.) in Hessen (Odonata: Lestidae). *Mitt. int. ent. Ver.* 19(1/2): 67. – (Herzog-Adolf-Str. 11, D-61440 Oberursel).
1 ♂, 14-VII-1991, Oberursel.

(9616) WASSCHER, M.T., 1994. Natuurontwikkeling van matig voedselarme wateren voor libellen. – Development of oligo-mesotrophic dragonfly habitats. *Ent. Ber., Amst.* 54(4): 54-59. (Dutch, with Engl.s.). – (Minstraat 15 bis, NL-3582 CA Utrecht).
Out of 69 indigenous spp. in the Netherlands, 21 are rare or threatened. For the latter, oligo-mesotrophic waters are among the most important habitats. These also support assemblages with the highest number of odon. spp. Due to

acidification, eutrophication and the sinking of groundwater level, however, they are difficult to maintain. Suggestions for long and short term management are presented.

(9617) [WATSON, J.A.L.], 1994. *A tribute to J.A.L. (Tony) Watson. 20.9.1935-4.12.1993.* CSIRO Div. Ent., Canberra. 40 pp. – (c/o Ms H. Abbey, Div. Ent., CSIRO, P.O. Box 1700, Canberra, ACT 2601, AU).
A very beautiful tribute volume, presented at the dedication of the Meeting Room, Insect pathol. Lab., CSIRO, Canberra, to the memory of this great odonatologist (March 30, 1994). It contains numerous portraits, various tribute addresses, and his bibliography (149 titles; 1957--1993).

(9618) [WATSON, J.A.L.] FLETSCHER, B., 1994. Obituary Dr J.A.L. Watson. *Myrmecia* 30(1): 3-4. – (Author's address not stated).
Contains a recent portrait, brief biographic data and a concise evaluation of his scientific work. – Cf. *OA* 9467.

(9619) WERZINGER, S. & J. WERZINGER, 1994. *Dritter Zwischenbericht über Planbeobachtungen an der Grünen Keiljungfer (Ophiogomphus cecilia) im Bereich der Aurach in den Landkreisen Neustadt/Bad Windsheim und Erlangen/Höchstadt, Mittelfranken.* Abt. Okol. heimischer Libellen, Naturh. Ges. Nürnberg. iii+27 pp., Appendix 18 pp. excl. – (Authors: Zwernberger Weg 29, D-90449 Nürnberg).
For the preceding interim reports cf. *OA* 8596, 8900. – Although in this preliminary version the enormous wealth of information is not yet properly organised, the series is assuming the proportions of a very serious monograph on autecology, behaviour and population biology of O. cecilia. A concluding and summarizing publication is scheduled for 1995.

(9620) ZEEGERS, T.W.P., 1994. Verslag van de 148e zomervergadering van de Nederlandse Entomologische Vereniging, 11-13 juni 1993, te Woold bij Winterswijk. Odonata-libellen. – [Report on the 148th Outdoor Summer Meeting of the Netherlands Entomological Society, 11-13 June 1993, at Woold nr Winterswijk. Odonata-dragonflies]. *Ent. Ber., Amst.* 54(5): xii-xiii. (Dutch). – (Weegschaalstraat 207, NL-7521 CH Enschede).
An annotated list of 7 spp., from 2 localities; Gelderland prov., the Netherlands.