

ODONATOLOGICAL ABSTRACTS

1977

- (6065) STRONK, T.G., 1977. K faune, ekologii i biologii strekoz (Odonata, Insecta) Komi ASSR. — [On the fauna, ecology and biology of the Komi ASSR dragonflies (Odonata, Insecta)]. In: Geograficheskie aspekty ohrany flory i fauny na severo-vostoke Evropeyskoy chasti SSSR, pp. 87-96. Geogr. Obshch. SSSR (Komi Filial), Syktyvkar. (Russ.). — (Author's address not stated).
45 spp. are listed and discussed, of which 10 were not previously recorded from the Komi Autonomous SSR, USSR. It is stated that the dragonfly impact on the mosquito larvae is insignificant. With reference to the odon. fauna, 4 types of aquatic habitats are discussed in southern Komi.

1981

- (6066) (Anonymous), 1981. Contemporary conservationists. 4. Norman Winfried Moore, M.A., Ph. D., F.I. Biol. *Biol. Conserv.* 19 (1980-81): 3-5.
A biographic note on Professor Dr N.W. Moore (born: Feb. 24, 1923), one of the principal architects in developing the present-day policies of wildlife conservation in Britain and Chairman of the IUCN Specialist Group Odonata. A portrait is also provided.
- (6067) JENKINS, D.M., 1981. *Weight measurements of Odonata in relation to teneral growth*. M. Sc. thesis. Univ. Louisville, 73 pp. — Microfilm or xerox copy available from University Microfilms International, Disser-

tation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No. ADG13-17036.0000.

[Not available for abstracting].

- (6068) McVEY, M.E., 1981. *Lifetime reproductive tactics in a territorial dragonfly, Erythemis simplicicollis (Odonata, Libellulidae)*. PhD thesis, Rockefeller Univ., New York, 414 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG85-00629.8504.

[Verbatim abstract]: Males wait at ponds for females either as territorial residents, defending sections of floating algae, or as non-territorial satellites. Some males switch between resident and satellite status one or more times within a day while others remain as residents or as satellites throughout the day. Owing to the short reproductive lifespan of this dragonfly (average 10 days), the relationship between mating tactic, longevity, and lifetime reproductive success could be examined in a well isolated population in Gainesville, Florida. All males (N = 720) were marked and aged by thoracic color patterns and 80-95% of all female oviposition was recorded for the population over a four month period. — Males adopting the satellite tactic obtained fewer copulations per unit time than did residents although the magnitude of the difference was density dependent. Females refused to oviposit after mating with a satellite about 4 times as often as after mating with a resident. Under all densities observed at one pond (range 8-21

males daily on 52x 2 m of algae), satellites could guard their females for only 1/4 as long as could residents. — Male reproductive success and the amount of time spent as resident increased with age for the first 3 to 5 breeding days after which the success rate leveled off. Within age-class variation in breeding success after 5 breeding days ranged from 0 to 13 matings and 0 to 8000 eggs fertilized daily. Males acting predominantly as satellites beyond 3 to 5 days were not compensated for their low fertilization rate by extended longevity compared to those predominantly resident; they were slightly although not significantly shorter lived ($N = 44$ male lifetimes at one pond only). Variation in male reproductive success might have resulted from variation in success at finding territorial vacancies. Experimental manipulation of both residents and their territories revealed that individual male characteristics were more important to territory acquisition and maintenance than was prior residency. Males acting as satellites were competitively excluded from defending territory and were simply making "the best of a bad job".

- (6069) MOORE, N.W., 1981. Insect conservation in Britain: National Nature Reserves. *Atala* 6(1/2): 26-27. — (The Farm House, Swavesey, Cambridge, CB4 5RA, UK). The background of conservation activities in Great Britain is described. The Nature Conservancy Council focuses on nature reserves, the support of research programs, general advising, and the dissemination of information. Actual conservation of organisms is achieved through nature reserves and through Sites of Special Scientific Interest; the latter encompasses private land holdings. Using the Lepidoptera and Odonata as examples, it is concluded that selecting nature reserves on an ecosystem basis has been successful. Additional research focusing on the management of wildlife within reserves is needed to maintain optimum populations on existing reserves and to determine which types of specialized management techniques must be applied to specific sites or organisms.

- (6070) MOORE, N.W., 1981. The conservation of Odonata in Great Britain. *Atala* 7(2): 64-67. — (The Farm House, Swavesey, Cambridge, CB4 5RA, UK).

Recent unprecedented changes in agricultural practices have caused the loss of numerous aquatic habitats throughout the British lowlands. On the other hand, water supply schemes and increased gravel and clay extraction have produced many new water bodies. The effects of these activities on the British odonate fauna are discussed. Since 1950, *Coenagrion scitulum*, *C. armatum* and *Oxygastra curtisi*, have almost certainly become extinct. Populations of *Lestes dryas*, *Aeshna isosceles* and *Sympetrum sanguineum* have become much reduced; the first 2 are now very rare. *Orthetrum cancellatum* and *Aeshna mixta* appear to be increasing. National Nature Reserves in Britain are selected as representatives of habitat types rather than to protect particular spp., nevertheless 32 out of the 41 spp. breeding regularly in 1950 now occur in these reserves. 3 other spp. are protected in reserves managed by voluntary conservation bodies and 2 others in the state-owned New Forest. The scheduling of the Hampshire locality of *O. curtisi* as a "Site of Special Scientific Interest" failed to prevent its extinction through the pollution of its habitats. The value of several nature reserves for dragonflies has been increased by making new ponds. Populations of local spp. such as *Leucorrhinia dubia*, and *S. sanguineum* have been increased, and *Coenagrion mercuriale* was encouraged to colonise a reserve where it was previously absent by these means. The Nature Conservancy Council is undertaking experiments with the aim of reintroducing spp. into the Fens which have become extinct there in recent years.

- (6071) OCHARAN LARRONDO, F.J., 1981. Los insectos inferiores. In: S. Cañada, [Ed.], *Enciclopedia temática de Asturias*, Tomo 3: *Zoología-Invertebrados*, pp. 203-212. Gijón, [ISBN 84-7286-183-X]. — (Author: Depto Zool. & Ecol., Fac. Biol., Univ. Oviedo, Oviedo, Spain). The Odon. are dealt with on pp. 205-212.

General aspects are briefly stated, and the Austrian spp. are discussed in considerable detail.

- (6072) YADAV, U.R., S.B. KARKI, T.B. KARKI, B. PRASAI & G.N. BHANDARI, 1981. The physical environment and bottom fauna of a historical pond, Ranipokhari in Kathmandu, Nepal. *J. Inst. Sci. Technol., Kathmandu* 4: 179-194. — (Zool. Instruction Committee, Tribhuvan Univ., Kirtipur Campus, Kathmandu, Nepal).

Data on physico-chemical properties of this well known pond in the city of Kathmandu are presented along with a list of benthic macroinvertebrates collected during May-Sept., 1980. As far as the Odon. are concerned (*Sympetrum fonscolombei*, *S. vulgatum*, *Coenagrion* sp.), the latter is not only inadequate, but can be solely characterised as ridiculous, as is the case of the previously published lists by the same senior author (cf. e.g. *OA* 4725 and 5694). A single record is known from Nepal of *S. fonscolombei*, while *S. vulgatum* and *Coenagrion* sp. do not occur there.

1982

- (6073) CARLE, F.L., 1982. *A contribution to the knowledge of the Odonata*. PhD thesis, Virginia Polytechn. Inst. & St. Univ., 1114 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG83-04097.0000.

[Verbatim abstract]). Theories concerning the origin of insect wings and flight are reviewed and a new scenario for their origin proposed. It is suggested that environmental conditions of the small stream were responsible for the evolution of insect flight, and that thermoregulation as well as respiration was important in the preadaptation of wings. The possibility that the five paired convex-concave vein systems each represented a dorsal-ventral blood channel is suggested. — Odonata wing vein homology and nomenclatural systems, and phylogeny are reviewed. The process of vein loss is evaluated in the Palaeoptera and a new system of odonate wing vein homologies

proposed. The odonate wing mechanism is analyzed and the heretofore overlooked discal nodus characterized. Reevaluation of the comparative morphology of fossil and recent Odonata indicates that Protozygoptera and Protanisoptera represent evolutionary side branches, that the Anisozygoptera is polyphyletic, and that Isophlebiidae and Calopterygoidea are the most generalized Odonata known. — Previous scenarios explaining evolution of the unique odonate copulatory process are reviewed. Considering the copulatory behavior of the Calopterygoidea generalized supports evolutionary trends toward male domination and in-flight completion of the process. Assuming direct sperm transfer the original odonata mode requires that originally oviposition be in tandem and that sperm transfer to and from male anterior abdominal sterna be accidental. In contrast, assuming an original indirect transfer of sperm leads to a copulatory sequence similar to that of the Odonata. The proposed scenario differs from others in that extraordinary postures are not envisioned, the process is completed at rest, and the odonate tandem hold is developed prior to copulation. — Anisopteran morphology and phylogeny are reviewed and reliable identification keys developed for North American families and genera, and for 180 anisopteran species collected in Virginia and vicinity. Each species is described and photographed, including seven new species. The biogeography of Virginia Anisoptera is best explained by overlapping biotic regions, the fauna being a mixture of eastern North American, boreal, and tropical elements. New efficient methods for collecting, preserving, and rearing Odonata are described.

- (6074) STONE, S.L., 1982. *Electrophysiology and pharmacology of a local circuit feedback system in neurons of the ocellar retina*. PhD thesis, City Univ. New York, 460 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG82-22983.0000.

[Verbatim abstract]: Intracellular electrophysi-

ological and pharmacological studies of photoreceptor and L-neuron (second order neuron) responses in the dragonfly ocellar retina suggest the hyperpolarizing OFF transient in the receptor reflects synaptic feedback from L-neuron dendrites onto receptor terminals. The receptor OFF response was normally observed when recording more proximally, closer to the nuclear and synaptic regions but was not seen when recording more distally, closer to the rhabdomeric end of the cell. Both the hyperpolarizing OFF response in the receptor and the depolarizing OFF response in the L-neuron are apparently generated in the ocellar plexiform layer because they were not eliminated when the L-neuron processes were isolated from the brain by severing the ocellar nerve. Direct evidence for synaptic feedback onto receptor terminals is provided by antidromic stimulation experiments, in which a normal-appearing OFF transient was recorded intracellularly from the dark-adapted receptor in response to the application of brief hyperpolarizing current pulses to the ocellar nerve, and pharmacological studies in which the responses of ocellar retinal neurons (in intact and cut nerve preparations) were modified by various drugs known to interfere with synaptic transmission. Cholinergic agonists mimicked some effects of light on the receptor and L-neuron response, curare reduced or blocked the receptor OFF response and eliminated all activity in the L-neuron, and picrotoxin increased the magnitude of the OFF response in both types of ocellar neurons. These findings are consistent with a sign-conserving feedback model and support the view that the receptor transmitter may be acetylcholine and the feedback (L-neuron) transmitter could be GABA. In addition, some of the results suggest that lateral synaptic interactions between photoreceptors and L-neuron dendrites may also contribute to the observed changes in the waveform of ocellar retinal responses. — Spontaneous fluctuations in dark potential were commonly observed in intact nerve preparations following exposure to drugs, and in cut nerve preparations untreated with drugs. In photoreceptors, the dark potential appeared to fluctuate between two

distinct dark equilibrium levels. Such spontaneous dark oscillatory behavior may represent disruption of the dark equilibrium of a local circuit feedback loop whose stability is perturbed by pharmacological manipulation or by isolating L-neuron processes from the brain.

1983

- (6075) BREUGELMANS, R., 1983. *107 maal Sub Signo Libelli*. Reflex, Utrecht. 103 pp. [ISBN 90-6322-092-8]. (Dutch).
This is a descriptive bibliography of 107 works, produced (1974-1983) by "Sub Signo Libelli", a noted small private printing press in Geesbrug, the Netherlands. It was printed in 400 numbered copies, and also contains the reproductions of the vignettes used by the printer, 4 of which are images of dragonflies (a woodcut by T. Bewick, and 3 drawings by B. van Blommestein and P.G. Reuter).
- (6076) HONG, Y.-c., 1983. Odonata. In: Middle Jurassic fossil insects in North China, pp. 22-26, pls 1-2 excl. Geol. Publ. House, Beijing. (Chin.). — (Inst. Nat. Hist., Beijing Mus. Nat. Hist., 126 Tien Chiao St., Beijing-2, P.R. China).
The larvae of *Samarura gigantea* Redtenb. & Ganglb. and *S. punctatocaudata* sp. n. (incertae sedis) and the adults of *Huabeia liugouensis* gen. n., sp. n. (incertae sedis) and *Paraliasophlebia chengdeensis* gen. n., sp. n. (Liasophlebiidae) are described and figured.
- (6077) JOHNSON, W.E., Jr, 1983. *The functional morphology of the rectal gill chamber of Erythemis simplicicollis naiads (Odonata: Libellulidae)*. PhD thesis, Univ. Southern Mississippi, 97 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order NO.: ADG84-14924.0000.
[Verbatim abstract]: This research characterizes the functional morphology of the rectal gill chamber in penultimate instar larvae. The total surface area available for exchange in the rectal gill chamber approaches 600 square mm.

There is a lamellar valve which apparently functions with postbranchial and anal valves to isolate the main branchial chamber from the external environment. Cuticular lamellar spines prevent adjacent lamellae from adhering to each other and allow water to circulate between the lamellae. A complex arrangement of tracheae connect the gill lamellae to the rest of the tracheal system, enabling oxygen transport to tissues. Basal pads are arranged to expose maximum surface area to water, assuring adequate ion uptake. An accessory layer of tissue of unknown function lies between the respiratory and chloride epithelia.

- (6078) LAVOIE-DORNIK, J., 1983. *Electrophysiology et ultrastructure chez deux espèces d'Enallagma (Odonata: Coenagrionidae)*. PhD thesis, Univ. Montreal. XXVIII+118 pp., tabs, figs & pls excl. — (Dép. Biol., Univ. Laval, Québec, Qué., G1K 7P4, CA). Electrophysiology and ultrastructure of the compound eye were studied in the larval and adult stage of *E. cyathigerum* and *E. clausum*.
- (6079) PIERCE, R.J., 1983. The charadriiforms of a high-country river valley. *Notornis* 30(3): 169-185. — (Zool. Dept, Otago Univ., Dunedin, NZ).
On p. 173, *Xanthocnemis zealandica* is listed from the delta of the Cass River, Lake Tekapo, New Zealand.

1984

- (6080) COLTON, T.F., 1984. *Predation by damselfly naiad on two species of zooplankton: preference, switching, and the modelling of predation*. PhD thesis, Duke Univ. Durham (NC), 184 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG84-24777.0000.
[Verbatim abstract]: Functional response models can often describe the change in feeding rate of predator with density of a single prey type, but the effect of adding a second prey type on a predator's feeding behavior cannot necessarily be predicted by knowing

the functional response to each prey type separately. — In a laboratory study, the functional response of 10th instar *Enallagma aspersum*, to a copepod, *Diaptomus spatulocrenatus*, and a cladoceran, *Simocephalus serrulatus*, were measured by single-prey trials at 6 densities of each prey. Rogers' random predator equation, a modification of Holling's type 2 functional response equation, fitted the data well. Biological interpretations of the model parameters are discussed in light of behavioral observations. — The predictions of a one-predator/two-prey model based on the random predator equation were tested by performing all 36 corresponding pairwise combinations of densities of the 2 prey spp. in a factorial design. The model predicts that larvae should show a preference for *Simocephalus* over *Diaptomus*, and that *Diaptomus* should experience a greater reduction in predation in the presence of *Simocephalus* than should *Simocephalus* in the presence of *Diaptomus*. The two-prey trials show that the reverse is true; the model fails to predict adequately these results. — Preference varied with the density of *Diaptomus*, but not with the density of *Simocephalus*, total prey density, or the ratio of the two prey types. This predator did not preferentially select the most abundant prey type available, nor did it select prey in a way that maximized its intake of dry mass of prey. — The "attack rate" and "handling time" parameters that describe predation on *Diaptomus* both increased significantly with increasing density of *Simocephalus*, whereas the "handling time" parameter for predation on *Simocephalus* decreased significantly with increasing density of *Diaptomus*. Clearly, the outcome of this three-species interaction cannot be predicted by studying the component two-species interactions. The factorial design, which included all three species, permitted the use of a modified random predator model as well as other, less mechanistic, models.

- (6081) CORREA, C.M., 1984. *Physiological short-term indicators of chronic stress in the dragonfly *Somatochlora cingulata* (de Selys) (Odonata: Anisoptera)*. PhD thesis, Univ. Massachusetts, 131 pp. — Microfilm or xerox

copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG84-18881.0000.

[Verbatim abstract]: The problem of pollutant toxicity and subsequent physiological impact on aquatic organisms is often reflected in the oxygen-uptake and ammonia excretion rate either through disrupted metabolism or in the mobilization of a compensatory homeostatic mechanism. Consequently, the respiration and excretion rates provide a critical index of environmental suitability and the cost for survival. — Accordingly, the objective of this research was to determine the feasibility of interpreting the graded physiological response to stress as an index of environmental quality. Hence, the oxygen (O) consumption, ammonia nitrogen (N) excretion, O:N ratios, of four larval growth stages of cingulata were determined, relative particularly to elevated aluminum and hydrogen ion concentrations, and to naphthalene and trichloroacetic acid as well. — An increase in respiration and ammonia excretion rates resulted in an increase in O:N ratios for all larval stages, upon exposure to low pH and sublethal aluminum concentrations plus low pH. The earlier growth stages, however, were the most sensitive. The ratios obtained may be indicative of a decreased dependence on protein reserves and increased utilization of carbohydrate or lipid reserves. The same responses were observed in animals exposed to naphthalene and trichloroacetic acid. The ratios obtained indicated that these organic compounds, also, decreased dependence on protein reserves. However, these O:N ratios were less pronounced than in animals exposed to low pH and aluminum plus low pH. — It was found that nitrogen excretion and oxygen consumption do not always vary in the same direction, nor to the same extent, in response to changes in the environment, and it is believed that the balance in catabolism between the different nutrient reserves in the tissues is useful in assessing the physiological responses of dragonfly larvae to various stressful environments. — Because the physiological changes reported in this research are easy to analyze, I suggest considering their incorporation

into a routine screening bioassay procedure for chronic toxicity.

- (6082) DUFFY, W.G., 1984. *The population ecology of the damselfly *Lestes disjunctus disjunctus* (Zygoptera: Odonata) in the St. Mary's River, Michigan*. PhD thesis, St. Univ. Mich., 133 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG86-07073.8608.

[Verbatim abstract]: A demographic investigation of a natural population of *L. d. disjunctus* was conducted during 1982-1983. Field studies investigated life history, distribution, and demographics. Laboratory studies examined the influence of water temperature on egg development, the influence of water temperature, prey density, and coexisting predators on growth and survival of larvae and the influence of fish on survival and habitat selection. — The 1982 cohort oviposited an estimated 3,202,000 eggs in the 4.03 ha study area. Mortality in the egg stage was estimated to be 77.2%. Egg mortality factors were: habitat loss through anthropogenic sources (18.9%), overwintering (16.7%), hatching difficulty (6.0%), and unexplained sources (35.6%). Relative mortality among 10 larval instars varied and was greatest in the final instar (71.4%). Relative mortality through all nymphal stages was 94.7%. An estimated 35,800 adults emerged from the study area yielding an estimated survival rate from the egg to adult stage of 1.2%. Lower potential fecundity in 1983 (45.2 eggs/instar) than in 1982 (73.5 eggs/instar) combined with increased mortality in 1983 to produce a negative population rate of increase (λ) value of -0.612. — Growth of larvae in the laboratory was significantly greater at 20°C than at 16°C. Differences in growth among prey density treatments were not significant. However, prey density did significantly influence survival of larvae while water temperature did not. — Survival of larvae in the laboratory was significantly lower in the presence of the larval *Aeshna canadensis* than in the presence of other coexisting predators. Other predators

may also influence survival, although differences were not significant. Growth of nymphs was not influenced by coexisting predators. — In the absence of bluegill sunfish (*Lepomis macrochirus*) larvae exhibited little discrimination among 3 cover densities or 3 cover types (macrophytes, aquarium bottom, and sides). In the presence of fish, they selected or were restricted in distribution to macrophytes at all cover densities. Distribution of larvae was significantly affected and survival reduced by bluegill.

- (6083) HONG, Y.-c., 1984. Odonata. In: Palaeontological atlas of North China, Vol. 2, Mesozoic, pp. 132-137, pl 63 excl. Geol. Publ. House, Beijing. (Chin.). — (Inst. Nat. Hist., Beijing Nat. Hist. Mus., 126 Tien Chiao St., Beijing-2, P.R. China).
6 odon. spp. are described and figured, of which *Jibeigomphus xinboensis* gen. n., sp. n. (Gomphidae) and *Sinostenophlebia zhanjiakouensis* gen. n., sp. n. (Aeschniidae), both described from the adults, are new.

1985

- (6084) BASTIDAS, A., 1985. La Libélulas y las mariquitas anónimos aliados del hombre [...]. *El Nacional, Caracas*, issue of Oct. 26, p. C-5. Daily's article, drawing attention to the economic importance of dragonflies and ladybird beetles.
- (6085) HONG, Y.-c., 1985. Insecta. In: Mesozoic stratigraphy and paleontology of the Guyang coal-bearing basin, Neimenggol Autonomous Region, China, pp. 85-100, pls 17-20 excl. Geol. Publ. House, Beijing. (Chin.). — (Inst. Nat. Hist., Beijing Mus. Nat. Hist., 126 Tien Chiao St., Beijing-2, P.R. China).
The larva of *Neimenggomphus dongwugaiensis* gen. n., sp. n. (Gomphidae) is described and figured.
- (6086) HONG, Y.-c., 1985. Odonata. In: Fossil insects, scorpionids and araneids in the diatom strata of Shandong, pp. 14-18, pls 1-2 excl. Geol. Publ. House, Beijing. (Chin.). — (Inst. Nat. Hist., Beijing Nat. Hist. Mus., 126 Tien

Chiao St. Beijing-2, P.R. China).

Adult *Lanthus wuluogongense*, sp. n. (Gomphidae) and the adult and larva of *Nasiaeschna orientalis* sp. n. (Aeshnidae) are described and figured.

- (6087) KAPOOR, V.C., 1985. *Perspectives in insect systematics*. Inter-India Publs, New Delhi. XIV+512 pp. [ISBN none].
A handbook on insect systematics, dealing with the Odon. on pp. 55-71, and containing family keys for the adults and larvae.
- (6088) TOTH, S., 1985. Adatok a Bakony hegység szitakötő faunájához (Insecta: Odonata). — Data to the knowledge of the Odonata-fauna of the Bakony Mountains (Insecta: Odonata). *Folia Mus. hist.-nat. bakonyi*, 4: 43-84. (Hung., with Engl. & Germ. s's). — (Bakonyi Természet-Tudományi Múzeum, Postafiók 36, HU-8420 Zirc).
This is a comprehensive catalogue of all the regional records made after the appearance of the paper listed in OA 3141. New are *Aeshna viridis* (Fenékpuszta, 12-VII-1980) and *Anax parthenope* (several localities and dates).

1986

- (6089) CARCHINI, G. & E. ROTA, 1986. Attuali conoscenze sulla distribuzione degli Odonati dell'Italia meridionale. *Biogeografia* (N.S.) 10(1984): 629-684. (With Engl. s.). — (Dipt. Biol., II Univ. Roma "Tor Vergata", Via O. Raimondo, I-00173 Roma).
57 spp., from 224 south Italian localities are catalogued and mapped on a 10-km UTM grid. All the literature is considered and notes on geographic and altitudinal distribution are provided. The biogeogr. composition of the south Italian fauna is analyzed, and it is compared with that of the adjacent regions. Using the Baroni-Urbani & Buser similarity index (1976. *Syst. Zool.* 25: 251-259), the similarity is highest between the South- and Central Italian faunas.
- (6090) CARRIERE, J., 1986. Un bien énigmatique odonate: *Macromia splendens* (Pictet, 1843) (Anisoptère: Corduliidae). *Sciences nat* 51:

- 23-24. — (66, av. Jean Constans, F-34500 Beziers).
A note, with a photograph (turned upside down), presenting records and field notes from the surroundings of Beziers, France.
- (6091) CHAO, H.-f., 1986. Notes on the genus *Stylurus* Needham from Fujian, with descriptions of the male and the nymph of *S. flavicornis* (Needham) (Odonata: Gomphidae). *Wuyi Sci. J.* 6:35-43. (Chin., with Engl. s.). — (Biol. Control Res. Inst., Fujian Agric. Coll., Fuzhou, Fijian, P.R. China).
S. amicus (Needh.), *S. clathratus* (Needh.) and *S. flavicornis* (Needh.) are dealt with and keyed. The latter sp. is transferred from *Gomphus*, and *G. szechuanicus* Chao is synonymized with *S. amicus*. Full bibliographies of the 3 spp. are given and the important diagnostic characters are figured.
- (6092) D'ANTONIO, C., 1986. Ricerche faunistiche nell'oasi dei Variconi (foce del fiume Volturno — Caserta). I. Gli Odonati. *Boll. Ass. romana Ent.* 40(1/4): 1-7. (With Engl. s.). — (Inst. & Mus. Zool., Fac. Sci., Univ. Napoli, Via Mezzocannone 8, I-80134 Napoli).
15 spp. are listed from the Variconi wetlands (Volturno R. mouth, Campania, Caserta, southern Italy), and the protection of this biotope is suggested.
- (6093) D'ANTONIO, C. & G. DE FILIPPO, 1986. Segnalazioni faunistiche italiane. N. 88. *Oxygastra curtisi* Dale (Odonata Corduliidae). *Boll. Soc. ent. ital.* 118(4/7): 117. — (Inst. & Mus. Zool., Univ. Napoli, Via Mezzocannone 8, I-80134 Napoli).
A record from Capaccio (SA) is the first of this sp. from southern Italy.
- (6094) HMELEVA, N.N. & Yu. F. MUHIN, 1986. Svyaz' verkhniy letal'nykh temperatur s soderzhaniiem kremniya u ekologicheskii razlichnykh vidov gidrobiontov iz kontinental'nykh vozdushnykh rezervirov. — [Correlation between upper lethal temperatures and silicon content in ecologically different hydrobiont species from continental water reservoirs]. *Dokl. Akad. Nauk. SSSR* 291(5): 1272-1275. (Russ.). — (Inst. Zool., Acad. Sci. BSSR, Minsk. USSR).
Correlations were established in 2 molluscan, 2 crustacean and 1 bryozoan spp. (all named) and (unnamed) Odon. between lethal temperatures and the season of the year, as well as between upper lethal temperatures and Si content in the hydrobionts. The mechanism of the participation of Si in increasing the thermoresistance of aquatic organisms is uncertain.
- (6095) KLISS, M. & M.W. LUTTGES, 1986. Neuromuscular control of unsteady flows by dragonflies. *Abstr. Soc. Neurosci.* 12(2): 1206. — (First Author: Aerospace Engineering Sciences, Univ. Colorado, Boulder, Colorado 80309, USA).
[Verbatim]: The remarkable aerial maneuvers of dragonflies have been shown to rely on the utilization of unsteady separated flows. Such flows are both transient and spatially disparate. Specific constraints on flight rhythm are exacted by the use of unsteady flows. The present investigation focuses on the mechanisms through which the neuromuscular system can be coordinated to utilize wing interactions with these relatively complex flows. Understanding the operations of the centrally generated flight program is the goal of these studies. High speed 16 mm movies of restrained dragonfly wing kinematics demonstrate a spatial and temporal synchronization of both tandem wing sets with periodic vortical structures. Integrated force balance measurements correlated wing kinematics instances with high peaks of lift generation. Analysis of the wing box kinematics revealed that agonist and antagonist muscles act on opposite sides of a wing base pivot point to produce wing elevation and depression. Displacements and tilting of the scutum and sclerites are primarily responsible for changes in pronation and supination. Direct electrical stimulation of thoracic muscular systems shows that gross wing kinematics are relatively robust, arising from a combination of peripheral musculature and mechanics. More subtle kinematics, such as phase angle between fore and aft wings, can be driven at 0°-180° phase angles. Basic feedback controls also produce only minor modifications in wing kinematics. Removal of

encephalization influences led to larger amplitude electrically-elicited wing responses. Flight episodes were of longer duration than those of an intact insect, but were more difficult to elicit. Histologic techniques were employed to determine populations, locations and functional connections of cell bodies for the main flight motor neurons. Graphic reconstruction provided a simplified wiring diagram for the cell bodies. Final motor path roles of the larger cells have been partially identified. Electrical stimulation of the meso- and metathoracic ganglia elicited coordinated wing responses through a wide range of frequencies. High voltage stimulation levels produced complete flight episode kinematics that did not correspond to the stimulation frequency or phase relationship of the electrical stimuli. Initial extracellular recording studies reveal a relatively complex relationship between flight neuron firing patterns and the resultant driving of the flight musculature. These findings are compared to those known for flight control mechanisms of the locust. Unlike the locust, where details of the fluid-wing interactions are not well established, the results in the dragonfly can be related to the fluid dynamics that support the observed flight modes.

- (6096) NARAOKA, H., 1986. Study on the ecology of the damselfly *Cercion sieboldii* Selys (Coenagrionidae, Odonata) in Aomori-pref., northern Japan. 2. Mating behavior. *New Entomol.* 35(1/4): 7-16. (Jap., with Engl. s.). — (36-71 Motoizumi, Fukunoda, Itayanagi-cho, Kita-gun, Aomori, 038-36, JA).
The first part of this series was published in *Odonatologica* 16(1987): 261-272, and the research was conducted at the same site (1980-1985). The mating took place at the oviposition site, tandem occurred without any courtship display. Sperm translocation occurred while the pairs were perched, and was followed by copulation, in which 3 stages could be distinguished. The seminal vesicle still contains sperm during the first stage, but does not during the other 2 stages. Judging from the spermatheca size, the male may remove 70% of the previously deposited sperm during the first stage, and deposits its own sperm during the

second stage.

- (6097) OUDA, N.A., A.-H.M. AL-FAISAL & H.H. ZAYIA, 1986. Laboratory observations on the efficiency of seven mosquito larvae predators. *J. biol. Sci. Res.* 17(2): 245-252. (With Arab. s.). — (Biol. Res. Cent., Jadiriya, Baghdad, Iraq).
Representatives of Coleoptera, Hemiptera and Odon. (*Anax* sp., *Crocothemis erythraea*, *Diplacodes lefebvrei*, *Ischnura evansi*) were tested in the laboratory as to their predatory effectiveness in relation to the mosquito larvae. Total consumption was the highest in *Rhantus* (adult, Col.), followed by *Anisops* (larvae, Het.), viz. 1526 and 1491 specimens, resp. The odon. larvae consumed 547 (*Anax*), 440 (*Diplacodes*), 430 (*Crocothemis*) and 195 (*Ischnura*) mosquito larvae.
- (6098) POIRIER, D.G. & G.A. SURGEONER, 1986. Evaluation of the toxicity of spruce budworm insecticides to aquatic invertebrates. *Can. techn. Rep. Fish. Aquatic Insects* 1462: 99-120. (With Fr. s.). — (Second Author: Dept. Envir. Biol., Ontario Agric. Coll. Univ. Guelph, Guelph, Ont., N1G 2W1, CA).
The toxicities of 2 registered and 2 candidate forest insecticides to Crustacea and representatives of 5 insect orders (incl. *Ophiogomphus* sp.) were evaluated using continuous flow laboratory and field bioassay systems. — Results of this study were reported also in the paper listed in OA 6048.
- (6099) SANTAMARINA MIJARES, A., 1986. Los odonatos como biorreguladores de las fases larvales de los mosquitos. *Revta cub. Med. trop.* 38(1): 89-97. (With Engl. & Fr.s's). — (Inst. Nac. Higiene Epidemiol. & Microbiol., Infanta 1158, La Habana, Cuba).
Field and laboratory observations on the predatory capacity of larval *Pantala flavescens*, *Tramea abdominalis* and *Erythrodiplax umbrata* relative to the larvae of *Culex quinquefasciatus* are recorded for bare environments and for those with aquatic vegetation. Under laboratory conditions, in vegetation-free environment the capacities of the 3 spp. are similar, while *E. umbrata* is most ef-

- fective in vegetation. Under field conditions, in vegetation-free environment *T. abdominalis* and *E. umbrata* are more effective, while in vegetation the predatory capacities of the 3 spp. are similar and lower.
- (6100) SINGER, F., 1986. Ecological and physiological factors influence alternative mate-guarding behavior in dragonflies. *Am. Zool.* 26(4): 18A Abstract only. — (Dept Biol., Univ. Minnesota, Minneapolis, Minnesota, USA). [Verbatim]: 2 types of mate-guarding behavior are used by *Sympetrum obtrusum*: (1) tandem guarding, in which the male holds the female by the head while she oviposits along the grassy shoreline and (2) non-contact guarding, in which the male hovers or perches above the female while she oviposits. No takeover matings by intruder males were observed when males used tandem guarding, while a takeover frequency of 11% was associated with non-contact guarding. During 1984, low ambient temperatures and high wind speed were correlated with non-contact guarding. In 1985, measures of thoracic temperatures of males and females captured after mating revealed that high thoracic temperature in the male was the best predictor of tandem guarding, while low thoracic temperature was correlated with non-contact guarding. It is hypothesized that under environmental conditions that promote low thoracic temperatures maximum flight output is reduced, and tandem guarding is not physiologically feasible. These findings are used as part of a general model to explain variation in odonate postcopulatory behavior.
- (6101) SUZUKI, K., 1986. Variation of abdominal protuberances in the Japanese *Mnais* damselflies (Odonata, Calopterygidae). In: Entomological papers presented to Yoshihiko Kurosawa on the occasion of his retirement, pp. 42-50. Coleopterists' Assoc. Japan, Tokyo. — (Dept. Biol., Coll. Liberal Arts & Educ., Toyama Univ., Gofuku 3190, Toyama, 930, JA). Intraspecific and interspecific variability of abdominal protuberances, which occasionally develop on the mesial dorsal ends of the distal margins of the first and second abdominal segments, are reported using a total of 595 individuals, belonging to 18 local populations of 4 Japanese *Mnais* spp. The shape and size of the protuberances and the frequency of the occurrence are very variable in the 4 spp., even within one and the same population. They develop in *M. costalis*, *M. pruinosa* and in the unnamed *Mnais* sp. better than in *M. nawai*.
- (6102) SUZUKI, K. & H. KADOWAKI, 1986. Geographical distribution of *Mnais* damselflies (Odonata, Calopterygidae) in Shimane prefecture including Oki Islands, Chûgoku district, Southwest Japan. *J. Coll. liberal Arts Toyama Univ. (nat. Sci.)* 18(2): 35-45. (With Jap. s.). — (First Author: Dept Biol., Coll. Liberal Arts & Educ., Toyama Univ., 3190 Gofuku, Toyama, 930, JA). About 300 specimens, from 42 localities, referable to *M. nawai* and *M. pruinosa*, are reported and the geographical distribution of their various morphological forms is pointed out. The distribution of ♂-f *kadowakii* in *M. nawai* populations is discussed in some detail.
- (6103) SUZUKI, K. & H. KADOWAKI, 1986. Geographical distribution of *Mnais* damselflies (Odonata, Calopterygidae) in Shimane prefecture including Oki Islands, Chûgoku district, southwest Japan. (II). *J. Coll. liberal Arts Toyama Univ. (nat. Sci.)* 19(2):35-54, fold. map. excl. (With Jap. s.). — (Second Author: 176 Yamada, Daitô-cho, Ohara-gun, Shimane-ken, 699-12, JA). This is the continuation of the argument that stated with the paper listed in OA 6102. It is based on 1176 specimens of *M. nawai* and *M. pruinosa*, from 173 localities. With reference to the geographic distribution of the 2 spp., 5 different situations can be discerned from the point of view of the combination of various morphological forms in a given population. The origin of this phenomenon is discussed.
- (6104) WASHIZUKA, Y., S. HIMAKI & T. KUSUMI, 1986. Contents of potassium, calcium, magnesium and sodium in insects and soil animals. *Jap. J. appl. Ent. Zool.* 30(2): 150-152. (Jap., with Engl. title). — (Lab. Biol. Chem., Fac. Engin., Nippon Bunri Univ., Itigi,

Oita 870-03, JA).

Contains also information on Odon., but no specific names are stated.

- (6105) WISSINGER, S.A., 1986. *Comparative life histories and larval population interactions in a diverse assemblage of dragonflies (Odonata: Anisoptera)*. PhD thesis, Purdue Univ., West Lafayette, 363 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG87-00970.8703.

[Verbatim abstract]: In the first part the life histories of 14 spp. inhabiting a small Indiana pond are compared. Data on emergence, adult activity, and larval development were used to characterize the phenology, voltinism, and synchrony of each species. Although a wide variety of life histories were observed, the assemblage was dominated by asynchronous, univoltine species whose populations contained numerous sizes of co-occurring larvae. To predict the opportunity for competition and predation between species Hurlbert's overlap index was modified to include data on the frequency that similar and disparate size combinations of larvae co-occurred. The opportunity for pairwise and diffuse competition was highest for 5 medium-sized libellulids. These and other species were potentially most vulnerable to predation by 3 larger species that immigrate to the pond as adults. The indices predicted numerous patterns of biotic interactions that would go undetected in conventional overlap analyses. — The second part is focused on *Libellula lydia* and *Libellula luctuosa*, which were the numerical dominants at the study site. Both similar and disparate sizes of larvae of these species frequently co-occurred. To separate the intensities of competition and predation among these larvae, 2 (fall and spring) manipulative field experiments in artificial ponds were conducted. The design of these experiments relied on laboratory data which showed that food availability affected growth, but not mortality; and that larvae similar in size do not eat each other. Thus, competition in the field could be assayed by comparing the effect of density on growth

rates in treatments containing only larvae similar in size. Inter-odonate predation was measured by comparing the survivorship of larvae in combination with larger instars to that in the competition treatments. In spring, when resources were low, larvae at high densities grew significantly slower than those at lower densities. In fall, when resources were more abundant, no density-dependent growth responses were observed. In contrast, inter-odonate predation was more intense in fall, when it accounted for 25-45% of larval mortality. The results of the study indicate that the relative abundance of these and other dragonflies should be determined by a complex interplay between competition and predation.

1987

- (6106) (Anonymous), 1987. Alice Howard Ferguson Beatty. *Centre Daily Times* (Pennsylvania), issue of Nov. 24, p. B-3.
Obituary for Dr Alice Beatty, with a portrait and a fairly detailed biography (born: March 5, 1915, Dallas, Texas; deceased: Nov. 22, 1987, Lemont, Pennsylvania; 1940-1973 she published about 20 odon. papers, and was for many years among the noted United States dragonfly workers).
- (6107) ALCOCK, J., 1987. Male reproductive tactics in the libellulid dragonfly *Paltothemis lineatipes*: temporal partitioning of territories. *Behaviour* 103(1/3): 157-173. — (Dept Zool., Arizona St. Univ., Tempe, AZ 85287, USA). Males defend stream-edge territories several meters in length. Receptive females fly to the stream to oviposit in very small patches of barely submerged fine gravel; each territory contains at least one but rarely more than two patches. Territorial males intercept incoming gravid females, copulate very briefly with them while hovering over a potential oviposition site, and then release their partners, which usually oviposit for less than 2 min before leaving the stream. — Because mated females do not oviposit while in tandem with a male, neighboring territory owners sometimes succeed in stealing females before they have completed oviposition in their first mate's ter-

ritory. Interrupted females sometimes are receptive, and may copulate with an intruder and oviposit in his territory. — Gravid females arrive at the stream primarily in a 3h mid-morning period during which time the density of territorial males is greatest. Fights for territories are most frequent early in the daily activity cycle, just prior to the time when receptive females are most likely to appear. — There are many more males than sites with suitable oviposition substrate. Consequently competition for territories is intense, particularly at locations that attract relatively many females. From 2-4 males may claim favored territories in sequence on a given day, with the same males returning to partition ownership of the location temporally in the same order over several days. — Temporal partitioning of certain territories in *P. lineatipes* appears to be a consequence of males' ability to identify superior locations and superior times for territoriality, with the result that no one individual can monopolize a productive site for an entire daily flight period.

(6108) ANSELIN, A. & M. FERRERAS

ROMERO, 1987. Datos para el estudio faunístico de los odonatos de la provincia Huesca (España). *Bol. Soc. real esp. Hist. nat.* (Biol.) 83(1/4): 35-42. (With Engl. s.). — (First Author: Lab. Animal Ecol., Univ. Gent, Ledeganckstraat 35, B-9000 Gent; — Second Author: Dep. Biol. Animal, Fac. Cien., Univ. Córdoba, Avda San Alberto Magno s/n, ES-14004 Córdoba).

An annotated list is given of 20 spp. from 8 localities, of which 4 spp. are new to the fauna of the Huesca prov., Spain.

- (6109) ASAHINA, S., 1987. A list of Odonata recorded from Thailand. Part XVIII. Corduliidae-2. *Kontyu* 55(4): 699-720. — (Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA). This is the continuation of the paper listed in *OA* 5912. The known Thai records, synonymy, detailed descriptions and illustrations are provided for 8 spp. of the genera *Epophthalmia*, *Macromidia*, *Idionyx* and *Hemicordulia*. *M. shanensis* Fraser is new to Thailand, and it is considered here as a ssp. of

M. genialis Laidl. The description of the Chinese *I. carinata* Fraser is added, since it is very closely allied to *I. optata* Sel.

- (6110) BANKS, M.J. & D.J. THOMPSON, 1987. Lifetime reproductive success of the damselfly *Coenagrion puella*. *J. anim. Ecol.* 56: 815-832. — (Second Author: Dept Zool., Univ. Liverpool, P.O. Box 147, Liverpool, L69 3BX, UK).

Two inter-related studies are described, concerned with lifetime clutch production and determination of clutch size in *C. puella*. The results are used to investigate lifetime reproductive success in terms of the females' evolutionary biology and population dynamics. Most variation (70%) in reproductive success arises from variation in survival rather than variation in fecundity. Variation in rate of clutch production accounts for 20% of the variation in reproductive success, and variation in clutch size for only 10%. Females maximize their lifetime egg production by minimizing the interval between clutches, rather than by maximizing the size of each clutch. Since females only engage in reproductive activity on warm, sunny days, weather has a marked effect on female egg production; bad water means increased inter-clutch intervals and lower egg production. Clutch size is inversely related to body size. However, because large females survive for longer than small females, selection should favour large size in females. Egg size is not correlated with female size. There may be a delayed density-dependent population regulatory process, acting through the reduction in adult female size caused by high larval population density.

- (6111) BELLMANN, H., 1987. *Libellen beobachten - bestimmen*. Neumann-Neudamm, Melsungen-Berlin-Basel-W. en. 268 pp., frontispiece + 122 col. pls incl. [ISBN 3-7888-0522-6]. (Hard cover, 11.5x18.5 cm). Price: DM 38.- net. — (Author: Joh.-Palm-Str. 79, D-7900 Ulm-Wiblingen, FRG). Also available from the SIO Central Office, Bithoven.

This is a "photographic field guide", covering the Central European fauna and containing also a few mediterranean taxa. The photo-

graphs, combined with the pictorial keys (pp. 50-96), will certainly enable a quick identification of the spp. concerned. The infraspecific taxa are not considered, though some are incidentally mentioned in the text. This is causing a number of serious errors. Thus, "*Lestes virens* Charpentier 1825" does not occur in Central Europe, where the sp. is represented by *L. virens vestalis* Rambur, 1842. "*Aeshna subarctica* Walker 1908" is a nearctic taxon, unknown in Europe. The European vicariant is *A. s. elisabethae* Djak., 1922, which may be even specifically distinct from the former. It is also unfortunate that the rules of the Int. Code of Zool. Nomenclature are disregarded, all taxonomic names are written wrongly (no brackets, where necessary, and no commas between author and year of description). This may appear of minor importance, but it is a good example of the general trend of deprecation of systematic zoology, noticeable also in numerous other similar works. If, for a general reader, such details are considered "unimportant", so are the authors' names and the years of the description, which should then be omitted. The general chapters (pp. 7-49) are dealing briefly with morphology, behaviour, life history, ecology and conservation. In the treatment of single spp. (pp. 104-258), brief notes are provided on morphology, behaviour and on larval and adult habitats, and statements are made as to their status (occurrence and the Red List classification) in Germany. The author is a master of photography, and it is most unfortunate that the general reproduction of photographs is not optimal. Most but not all adults were taken in the field, and the absolute novelty of the book are the photographs of a large number of larvae. These, of course, could not be photographed in nature. In many cases the larval habitats are "mimicked" adequately, but in some the author was less successful (e.g. *Elodea* probably does not represent the most characteristic "setting" for *Coenagrion mercuriale*). Another positive feature of the book is the adequate locality documentation of most (adult) photographs. The much advertised Austrian locality of *Coenagrion hylas* could of course not be disclosed, though nothing was published on that popu-

lation since 1974 (*Odonatologica* 3: 181-185) and its present status is formally unknown and cannot be monitored. It is a bit awkward, however, that the Swiss locality of *Leucorrhinia caudalis* is, for "conservation's sake", kept "secret", though it has long ago been published in the paper listed in OA 4202. The *Abstracter* certainly agrees with the Author's statement (p. 48) that "the dangers (of collecting) for the odon. fauna are unreasonably ("masslos") exaggerated", but cannot go along with the suggestion of the latter that "the setting up of a collection is nowadays not very meaningful ("sinnvoll)". The experience gained by building up and working on an own collection will be for many indispensable, certainly so for those who have no access to institutional collections. Without serious work on a taxonomic collection no adequate taxonomic training is possible and it is the taxonomy and systematics that represent a *conditio sine qua non* for all biological disciplines, most particularly also for ecology and its derivative, conservation. The total prohibition of dragonfly collecting as promulgated recently in Germany (cf. OA 3112), and which is not combined with any effective or well defined habitat conservation measures, is in the *Abstracter's* opinion the most serious blow to dragonfly conservation in that country. — Although in a review the deficiencies of a work must be pointed out in order to enable their critical consideration for a possible revised second edition, the present work certainly is one of the best books of its kind, and it will certainly trigger the interest and facilitate the work of many in Germany and elsewhere. The author should certainly be warmly congratulated for the general organisation (with numerous collaborators) and well balanced presentation of the work, and not the least for its very timely production.

- (6112) BEUTLER, H., 1987. *Untersuchungen zur Populationsstruktur und -dynamik mitteleuropäischer Libellen (Odonata)*. Diss. doctor rer. nat. Humboldt Univ., Berlin. VIII+101 pp. — (Frankfurter Str. 23b, Postfach 63-13, DDR-1230 Beeskow, GDR).

The fieldwork was carried out (1980-1986) in 2

wetland areas in the German Democratic Republic ("Ostbrandenburgisches Heide- und Seengebiet" and the former open-cast mine "Grubenteich Annahütte", Cottbus distr.). The dissertation is organised into 3 main sections, viz. "Attempt at an interpretation of dragonfly populations" (pp. 7-21), "Structural parameters of populations and their specificity" (pp. 22-64), and "The aspects of population dynamics" (pp. 64-76). Dragonflies are shown as particularly fitting organisms for research on natural populations and their indicative value is emphasized.

- (6113) BRAUCKMANN, C., 1987. Die ältesten Libellen der Erdgeschichte. *Naturw. Rundschau* 40(12): 493. — (Fuhlrott Mus., Auer Schulstr. 20, D-5600 Wuppertal-I, FRG).

With reference to an anonymous note in the same journal (Vol. 40, No. 3, p. 116; 1987), the oldest known odon. fossils are listed and briefly discussed.

- (6114) *BULLETIN OF HOKKAIDO ODONATOLOGICAL SOCIETY*, Vol. 2, No. 2 (Dec. 25, 1987). — (c/o Dr H. Ubukata, Dept Sci. Educ., Kushiro Coll., Hokkaido Univ. Educ., Shiroyama I-15, Kushiro, 085, JA).

Fukumoto, A.: Autumnal dragonflies in Hidaka district (pp. 40-42); — A record of *Aeshna mixta* in Iburi district (42); — Dragonflies collected from Central and northern parts of Rumoi district (43); — New records of Odonata in Ishikari, Oshima, Hiyama, Shiribeshi, Sorachi and Soya districts (44-45); — Records of two aeshnid species in Okushiri Island (45); — *Matsuhira, K.*: Brief notes on the threat behavior of *Sympetrum eroticum* and mate refusal by females of *Sympetrum baccha* (46); — *Mitamura, T.*: Ten odonate species from Yuni-Cho, Sorachi district (47); — *Hiratsuka, K.*: Two new records of dragonflies in Shiribeshi district (48); — *Takahashi, T.*: Dragonflies new to Sorachi district (48); — *Hiratsuka, K.*: On *Ischnura elegans* and *Pantala flavescens* in Rishiri Island (49); — *Harauchi, Y.*: On the record of *Leucorrhinia dubia* in Tomakomai City (49); — *Hiratsuka, K.*: The report of the 1987 meetings of dragonfly watching in Sapporo City (50); —

The plan of 1988 dragonfly watching meeting in Sapporo (51); — *Ubukata, H.*: The results of the first two years of H.O.S. (52-53); — On the use of "mesh code" for distributional data (54-55); — The distribution table of the Odonata of Hokkaido, 4 (56-59); — The distribution table of the Odonata of islands near Hokkaido, 2 (60-62); — *Ueda, T.*: A request to send specimens of *Lestes sponsa* and *Sympetrum frequens* (63); — *Ubukata, H.*: Book review (64); — Review of articles on dragonflies of Hokkaido (65); — *Koyama, T.*: Notice of the Second Annual Meeting of H.S.O. (66). — The issue also contains several miscellaneous notes, a list of new members and letters received from the membership.

- (6115) CARPANETO, G.M., 1987. Una ricerca sulle libellule nella tenuta di Castel Porziano. *La Stampa* 121(35): 3. — (Dipto Biol. Anim. & Uomo, Univ. "La Sapienza", Viale dell'Università 32, I-00185 Roma).

A rather detailed account of a decade of dragonfly work by Prof. Carlo Utzeri's research team at the property of Castel Porziano nr Rome, published in a national daily.

- (6116) CHAO, H.-f., 1987. On the synonymy of a species of Mesopodagrion (Odonata: Megapodagrionidae). *Entomotaxonomia* 9(2): 112, 120. (Chin., with abridged Engl. translation). — (Inst. Biol. Control, Dept Plant Protection, Fujian Agric. Coll., Fuzhou, Fujian, P.R. China).

M. yachowensis Chao, 1953 is synonymised with *M. tibetanum* McLachlan, 1896. The latter has been originally described from eastern Tibet, but that province (Moupin) was recently politically attached to Sichuan. The sp. does not occur within the present administrative boundaries of Tibet, but it is widespread in the Oriental Region of China.

- (6117) *CONTACTBLAD NEDERLANDSE LIBELLENONDERZOEKERS* — [Newsletter of the Netherlands Dragonfly Workers], No. 14 (Oct., 1987). (Dutch). — (c/o Miss K. Verspui, Westerkade 27 bis, NL-3511 Utrecht).

A highly informative issue, containing ab-

- stracts of some of the papers presented at the 1985 (L. Beukeboom, N. Michiels & M. Wasscher, Eb. Schmidt, A. Anselin) and 1986 (N. Klerk, G.-J. van Pelt, W. Reinboud) Annual Colloquia, book reviews of publications listed in OA 6027 and 5926 (by M. Wasscher and H. Verhaar, resp.), and the traditional noteworthy records. M. Wasscher's paper on the "1987 dragonfly year" is particularly important (pp. 15-18). A list of membership mutations and Dutch translations of 4 Japanese *haiku* conclude the issue.
- (6118) D'ANTONIO, C., 1987. Attuali conoscenze sul popolamento odonatologico della Campania. *Boll. Soc. Naturalisti Napoli* 94(1985): 187-201. (With Engl. s.). — (Ist. & Mus. zool., Univ. Napoli, Via Mezzocannone 8, I-80134 Napoli).
44 spp. are listed from the province of Campania, southern Italy, and the biogeographic composition of the fauna is presented (34 spp. of mediterranean, 10 spp. of eurosiberian origin).
- (6119) D'ANTONIO, C., 1987. Segnalazioni faunistiche italiane. N. 105-109. *Boll. Soc. ent. ital.* 119(2): 123-124. — (Ist. & Mus. Zool., Univ. Napoli, Via Mezzocannone 8, I-80134 Napoli).
Noteworthy records are given for 6 spp. viz. *Calopteryx virgo padana* (first for southern Italy), *C. splendens caprai* (first for Campania and Basilicata), *Enallagma cyathigerum* (second for Calabria), *Lestes virens vestalis* (corrective note & a new record), *Cordulegaster b. boltoni*, and *Selysiothemis nigra* (first for Lazio).
- (6120) D'ANTONIO, C. & G. DE FILIPPO, 1987. Segnalazioni faunistiche italiane. N. 110. *Pyrhosoma nymphula* (Sulzer) (Odonata Coenagrionidae). *Boll. Soc. ent. ital.* 119(2): 124-125. — (Ist. & Mus. Zool., Univ. Napoli, Via Mezzocannone 8, I-80134 Napoli).
A record from Campania.
- (6121) DONATH, H., 1987. Die Libellen der nord-westlichen Niederlausitz (Teil 1). *Biol. Stud. Luckau* 16: 35-45. — (Hauptstr. 36/37, DDR-7960 Luckau, GDR).
Treatment of Coenagrionidae and Platycnemididae of the northwestern Lusatia (GDR).
- (6122) DONATH, H., 1987. Vorschlag für ein Libellen-Indikatorsystem auf ökologischer Grundlage am Beispiel der Odonatenfauna der Niederlausitz. *Ent. Nachr. Ber.* 31(5): 213-217. (With Engl. & Russ. s's). — (Hauptstr. 36/37, DDR-7960 Luckau, GDR).
On the basis of their dependence on 5 principal abiotic environmental features, the Lusatian (GDR) dragonfly spp. are classified into 15 ecological groups. The proposed system is expected to be serviceable in the assessment of the quality of the environment.
- (6123) FRIEDRICH, G. & C. MEIER-BROOK, 1987. Die Makrofauna der Schwimmblatt- und Unterwasserpflanzen in Kleingewässern in der Umgebung von Tübingen. *Carolinea* 45: 99-106. (With Engl. & Fr. s's). — (Wilsonstr. 116, D-7400 Tübingen, FRG).
7 odon. spp. associated with floating and submerged macrophytes in 3 ponds nr Tübingen are listed. Their importance as food source and the colonization density are discussed.
- (6124) GAUTHIER, A., 1987. Description d'une nouvelle espèce de *Macromia* Rambur de la forêt camerounaise, *M. caneri* spec. nov. (Anisoptera: Corduliidae). *Bull. Soc. ent. Mulhouse* 1987 (Oct.-Dec.): 49-52. (With Engl. s.). — (Lab. Ent., Univ. Paul Sabatier, 118 route de Narbonne, F-31062 Toulouse).
M. caneri sp. n. (♂ holotype: Edéa-Kribi, Cameroun, 25-VI-1982) is described and figured from a single specimen. It belongs to the sophia group of Gambles (cf. OA 2636). It is suggested that the sophia ♀, referred to by Selys (1878, *Bull. Acad. r. Belg.* (11)45: 1983-222), actually represents a ♀ of the new sp.
- (6125) GRACILE. [Newsletter of Odonatology]. Published by the Kansai Research Group of Odonatology, Osaka, No. 38 (Nov. 1, 1987). — (c/o K. Tani, 129 Jizo-cho, Nara, 630, JA).
Tsuda, S. & K. Kitagawa: Odonata of Southeast Asia collected by the late Mr. M. Iwasaki. Part I. Odonata of Malay peninsula

(West Malaysia) and Singapore (pp. 1-11); — *Obana, S.*: A consideration on *Anax n. nigrofasciatus* mainly through larval breeding (12-16); — *Tsuda, S. & I. Matsuda*: An observation on bryophyte oviposition of *Epiophlebia superstes* (Selys) (17); — *Inoue, K.*: Dr Norman W. Moore stayed in Kansai for two days (18-20); — Report of the survey trip on the odonate fauna of Awaji Island, Hyogo prefecture (1) in early summer (21-23); — *Nishu, S.*: Some important points on the odonate fauna survey in Awaji Island (24-25); — *Mariyama, K.*: Trip report on the catch of *Aeshnophlebia anisoptera* Selys at Pond-Jinjiya, Tomoga Islands, Wakayama prefecture (26-30); — *Tani, K.*: An appeal for stopping the drainage and desalination project of Shinjiku and Nakanoumi lakes and for seeking a scientific survey on Odonata (31); — *Tsuda, S.*: Establishment of Odonatological Library (32).

- (6126) GRILLOT, J.-P., N. BAUDRY-PARTIAOGLLOU & A. PROVANSAL-BAUDEZ, 1987. Organes périsympathiques et évolution chez les insectes. *Annls Soc. ent. Fr.* (N.S.) 23(4): 333-349. (With Engl. s.). — (Lab. Neuroendocrinol. Insectes, Univ. P. & M. Curie, 12 rue Cuvier, F-75252 Paris).

A review, dealing with most of the literature on the perisymphathetic organs. Their evolution is discussed from the points of view of morphology, ultrastructure and physiology, and it is compared with general insect phylogeny, though for the Odon. (6 genera) morphological evidence is available only.

- (6127) HAVRANEK, D., 1987. Odonata in the State of Tachira, Venezuela. *Quart. Young Entomol. Soc.* 4(4): 52. — (U.N.E.T., Apdo 436, San Cristobal, Tachira, Venezuela). A list of 6 spp., identified by J. Demarmels.

- (6128) HERZOG, H.-U. & N. LIAPPIS, 1987. The plasma composition of larval *Aeshna cyanea* Müller. III. The effect of different external media and temperature on the free amino acids. *Comp. Biochem. Physiol.* (A) 87(2): 427-431. — (First Author: Inst. Cytol., Univ. Bonn, Ulrich-Haberland-Str. 61a, D-5300

Bonn-1, FRG).

This is the continuation of a series of which earlier parts are listed in OA 5930 and 5931. — Using an automatic amino acid analyser the plasma free amino acids (FAA) of larval *A. cyanea* acclimated to deionized water (DW), hyperosmotic sea salt solution (SW) (both at 20° C) and to 4° C were investigated. In spite of conspicuous changes in hemolymph volume and plasma osmotic pressure (o.p.) the different external media tested have neither qualitative nor quantitative effects on the FAA except for a higher level of glutamic acid in SW. This indicates that the FAA do not play a role in osmoregulation in response to the external salinity. The total FAA concentration is significantly higher at 4° C than at 20° C due to increase in several FAA.

- (6129) HIGASHI, K., H. UBUKATA & Y. TSUBAKI, 1987. *Dragonfly mating systems*. Toukai Univ. Press, Tokyo. X+318 pp. — [ISBN 4-486-00913-4 C3045]. — Price: Y 2800.-. (Jap., with Engl. title). — (Publishers: Toukai Univ. Press, Toukai biru, Shinjuku 3-27-4, Shinjuku-ku, Tokyo, 160, JA). — Also available from the SIO Central Office, Bilthoven, The Netherlands.

This attractive volume (13.5x18.5 cm, hard cover, with protective flappers) is the first commercially available Japanese book on insect mating systems (based on behavioural ecology), and authored by professional workers. For many years the authors are among the leading authorities in this field of research. — The book is organised into 2 parts. The first of these deals with the mating systems in *Mnais* spp., *Nannophya pygmaea* and *Cordulia aenea amurensis*, which are described in detail, whereupon the male mating success is analysed in relation to wing coloration, body size, age and population density. The second part is composed of 4 chapters, dealing with intra- and interspecific diversity in male mating strategies, sperm competition and reproductive strategies after copulation, with female reproductive strategies and the evolution of ovipositing behaviour, and with the mating systems in other insect orders. A comprehensive bibliography of world literature pertaining to the

areas covered enhances the value of the work.

- (6130) HILTON, D.F.J., 1987. A terminology for females with color patterns that mimic males. *Ent. News*. 98(5): 221-223. — (Dept Biol. Sci., Bishop's Univ., Lennoxville, Que., J1M 1Z7, CA).

A portion of the female population in certain insects, especially some spp. of Odon., have colour forms which mimic the male pattern. A confusing series of names have been applied by various authors to these male-mimicking females. This terminology is reviewed and a suggestion is made to use "androchromatypic" for male-mimicking females, and "gynochromatypic" for females with the usual female colour pattern.

- (6131) HILTON, D.F.J., 1987. Odonata of peatlands and marshes in Canada. *Mem. ent. Soc. Can.* 140: 57-63. (With Fr. s.). — (Dept Biol. Sci., Bishop's Univ., Lennoxville, Que., J1M 1Z7, CA).

None of the 52 spp. of Zygoptera and 144 spp. of Anisoptera that are known to occur in Canada, exclusively occupies marshes or fens. *Nehalennia gracilis* is restricted to bogs whereas *Coenagrion interrogatum* predominantly occupies mossy bogs or fens. The following anisopterans solely, or predominantly, occupy bogs (with some occasionally in *Carex* marshes and (or) fens): *Gomphaeschna furcillata*, *Aeshna septentrionalis*, *A. sitchensis*, *A. subarctica*, *Williamsonia fletcheri*, *Soma-tochlora brevicincta* Robert, *S. franklini*, *S. incurvata*, *S. sahlbergi*, *S. septentrionalis*, *S. whitehousei* Walker, *Nannothemis bella*, and *Leucorrhinia patricia*. Most of this information is based upon collections of adults, but studies of larvae are needed to determine the adaptations necessary for life in bog, fen, or marsh habitats.

- (6132) JOURNAL OF THE BRITISH DRAGONFLY SOCIETY, Vol. 3, No. 2 (Nov., 1987). — (c/o Mrs J. Silsby, 1 Haydn Ave., Purley, Surrey, CR2 4AG, UK).

Merritt, R.: The origins and early history of the British Dragonfly Society: a personal account (pp. 21-27); — *Radford, A.P.*: Gilbert White's

observations on dragonflies (28); — *Godfrey, C. & D.J. Thompson*: Diets of three aeshnid species in an acid pond (29-31); — *Fox, A.D.*: *Ischnura pumilio* (Charpentier) in Wales: a preliminary review (32-36); — *Cross, I.C.*: A feeding strategy of a Pied Wagtail (*Motacilla alba yarellii* L.) on *Libellula depressa* L. (36-37); — *Raven, P.J.*: Odonate recovery following a major insecticide pollution of the River Roding, Essex (37-44).

- (6133) *LIBELLULA*. Mitteilungsblatt der Gesellschaft deutschsprachiger Odonatologen (GdO), Vol. 6, Nos 1/2 (1987; date not stated; mailed in Feb., 1988). — (c/o Prof. Dr R. Rudolph, Biol. Didaktik, Univ. Münster, Fliednerstr. 21, D-4400 Münster, FRG).

Steinrück, H.: Gestaltungstendenzen der Libellen in Bezug auf Hell-Dunkel-Kontraste (pp. 1-27); — *Banse, G.*: Libellenkartierung Landkreis Erding/Oberbayern, 1984 (29-39); — *Busse, R. & W. Clausen*: Nachweis der seltenen Arten *Coenagrion mercuriale* und *Coenagrion ornatum* (41-42); — *Classen, A.*: Beitrag zu den Gefahren einer submersen Eiablage von *Pyrrhosoma nymphula* Sulzer (43-46); — *Schmidt, E.*: Makabre Verstümmelungen bei eierlegenden Kleinlibellen (Odonata-Coenagrionidae) (47-49); — *Fotonotizen zur Biologie heimischer Odonaten. VI: Männchen-Abwehr durch Aeshna juncea im Brutbiotop* (50-54); — *Frank, H.*: *Cordulegaster bidentatus* Selys: ein Beitrag zur Fotodokumentation individueller Todesursachen (55-58); — *Lempert, J.*: Dass Vorkommen von *Sympetrum fonscolombei* in der Bundesrepublik Deutschland (59-69).

- (6134) MAIBACH, A. & C. MEIER, 1987. *Atlas de distribution des libellules de Suisse (Odonata) (avec liste rouge)*. Documenta faunistica Helvetiae, Vol. 3. Centre suisse de cartographie et de la faune & Ligue suisse pour la protection de la nature, Neuchâtel. II+231 pp. — ISBN none. — Price: sFr. 18.- net. (Also available from the SIO Central Office, Bithoven). — (First Author: Mus. Zool., Palais de Rumine, 5 place de la Riponne, C.P. 448, CH-1000 Lausanne-17).

Since the German version was received by the

Editors of *Odonatologica* some weeks earlier than the French edition, a full abstract is given under OA 6135. The 2 editions were almost, but not entirely identic. In the French edition the brackets are correctly given in the heading of the specific names.

- (6135) MAIBACH, A. & C. MEIER, 1987. *Verbreitungsatlas der Libellen der Schweiz (Odonata) (mit roter Liste). Documenta faunistica Helvetica, Vol. 4. Centre suisse de cartographie et de la faune & Schweizerischer Bund für Naturschutz, Neuchâtel. II+230 pp. — [ISBN none]. — Price: sFr. 18.- net. Also available from the SIO Central Office, Bilthoven). — (Second Author: Riedweg, CH-8606 Werrikon).*
This is a handbook (and a "treasure mine" of information) on the Swiss Odon. rather than merely a distribution atlas. Recently, several distribution atlases have been published for various European countries or regions, but the present work clearly surpasses most of them both in its typographic appearance and in the organisation and well balanced presentation of the material. — Between the "Preface" and "Appendix", there are 8 sections, viz. "Introduction" (pp. 5-11), "History of dragonfly research in Switzerland" (13-15), "Methods" (pp. 16-22), "Collaborators" (p. 23), "Acknowledgements" (p. 24), "Analysis and discussion of single species" (pp. 25-187), "Discussion and analysis" (pp. 188-221; with the following chapters: "The Swiss dragonfly fauna: in the past and in the present", "Biotope changes and their impact on the dragonfly fauna", "Review of the cantonal faunas", "Comparison of the Swiss fauna with that of Europe", "Red list", "Factor analysis", "Dragonfly conservation: future and tasks", "Concluding remarks"), and the "References". — The authors have analysed the inventory of practically the complete Swiss odonatol. literature (over 240 titles published between 1692-1986), and have supplemented this with observations furnished by almost 130 (mostly locally based) "recorders". The result is a coverage of ca. 25.600 records (for the period 1835-1986, partim) from ca. 1850 localities. — The treatment of all spp. is uniform and editorially very conveniently arranged: each sp. is dealt with on 2

opposite pp., the left p. bringing the text, and the other the distribution map, along with 2 graphs, showing the phenology and the occurrence relative to the thermic levels. The information on each sp. is organised under the paragraph titles: "General" (incl. the lowest and the highest alt. record), "Occurrence in Europe", "Occurrence in Switzerland", "Ecology", "Status in Switzerland", "Comparison with Europe", and "Remarks" (in places dealing with conservation). — In the general "Discussion" the fauna is analysed family-wise, the impact of biotope changes is emphasised, and the cantonal faunas are briefly characterized. — The criteria adopted for the status classification in the "Red list" are clearly outlined, making the list a highly indicative and valuable document, even so if one would "feel" some of the taxa would merit a different status. Out of 81 Swiss spp., 54% are considered extinct or highly threatened. — Considerations on odon. occurrence relative to vegetation and thermic levels have never been outlined as clearly as in the present work. There are some correlations in this respect, but odon. distribution does not fit the Swiss biogeographic regions defined on the basis of other insect orders. — Notes on conservation and some tentative hints in this area are of more than odonatol. bearing alone. — Finally, in the Appendix, a list of German, French and Italian vernacular names is given for all Swiss spp. Particularly the French and Italian are in most cases merely the modified taxonomic names. — The following are a new suggestions that could improve a possible revised edition: (1) According to the *Int. Code of Zool. Nomenclature*, the authors of the species-group names are to be put in brackets only when these are listed in a different genus than in the original descriptions; (2) "Lestes virens (Charp. 1825)" and "Aeshna subarctica (Walker, 1908)", do not occur in Switzerland, the known range of the former is restricted to Spain and W. France, the latter is a nearctic taxon; the Swiss taxa are *L. virens vestalis* Ramb., 1842 and *A. s. elisabethae* Djak., 1922; (3) It would be useful to draw some more attention to the conservation status of the alpine habitats. — For various reasons, a catalogue

of the actual locality names could not be presented within the scope of this work, nor is this the objective of the monographs in the present series. In this respect these differ, therefore, from the (now discontinued) *Catalogue des Invertébrés de la Suisse*, and from the (existing) *Insecta helvetica* series. The book is an impressive achievement and it is indispensable to any serious dragonfly worker in Switzerland and in the neighbouring countries. It will certainly have a great impact on Swiss odonatol. faunistics for many years to come. As is apparent from the long list of collaborators, the interest in this subject of field research is rapidly gaining ground there, and the present work will not only facilitate, but, above all, is bound to stimulate it significantly.

- (6136) MAIER, C.T., 1987. First Connecticut records of *Williamsonia lintneri* (Hagen) (Odonata: Corduliidae) and *Mitoura hesseli* Rawson and Ziegler (Lepidoptera: Lycaenidae). *Proc. ent. Soc. Wash.* 89(4): 836. — (Dept Ent., Connecticut Agric. Exp. Stn, P.O. Box 1106, New Haven, Conn. 06504, USA). 1 ♂ of *W. lintneri* was captured in a horizontal Malaise trap placed in an open, fen-like area surrounded by an Atlantic white cedar swamp: New London Co., Voluntown, 15-V-1986. Bibliography on the known records and status is stated.

- (6137) MALANGPO. Newsletter of the Thai National Office of the International Odonatological Society (S.I.O.), No. 4 (Nov., 1987). — (c/o Bro. A. Pinratana, St Gabriel's Coll., 565 Samsen Rd, Bangkok-10300, Thailand). *Kamnerdratana, P.*: Libellulid dragonfly species that prey upon the *Leucaena* psyllid (*Heteropsylla cubana*) (p. 9); — *Eak-Amnuay, P.*: Dragonflies in cotton-fields and interesting subjects on *Orthetrum sabina* (10); — Härmäläinen, M.: Dragonfly collecting in Thailand. II. May-June 1984 (11-15); — Pinratana, A.: Dragonfly photographing (16). On p. 15, there are 2 administrative notes, i.e. (1) As from the academic year 1988/89 onwards, some small grants will be available from the SIO for students working on the preparation of an odonatological M. Sc. or Ph. D. dissertation; —

(2) Early in January 1988 will appear a commercially published booklet, by A. Pinratana. It includes a checklist and a complete bibliography of the Thai odon. fauna, and 20 col. pls. Orders are accepted by the National Office and by the SIO Central Office.

- (6138) MATSON, C., 1987. [Testimony given by dragonfly connoisseur Charles Matson at a public hearing regarding the proposed construction of a concert stage on the shores of Central Park's Belvedere Lake]. *Wings* 1987 (Spring): 11. (New York Audubon Soc., 71 West 23rd Street, New York, NY 10010, USA).

19 odon. spp. occur at the 54-year-old man-made Belvedere Lake in Central Park, Manhattan, New York. The author hopes that New York City Parks Department will submit an alternative plan for the construction of the concert stage, preserving the local dragonfly habitat.

- (6139) MAZOKHIN-PORSHNYAKOV, G.A. & G.I. RYAZANOVA, 1987. Povedenie lichinok strekoz *Calopteryx splendens* (Harris): perevshcheniya "podsteregayushchih" hishchnikov. — Behavior of *Calopteryx splendens* (Harris) damselfly larvae: movements of the watching predator: *Izv. Akad. Nauk SSSR (Biol.)* 1987(2): 278-285. (Russ., with Engl. s.). — (Dept Ent., Fac. Biol., Lomonosov St. Univ., Moscow V-234, USSR). Tactile watching predator larvae of *C. splendens* have been demonstrated to have common movements, occurring mainly in the night. Females are more active than males. During the first 5-6 days after moult, the larval movements are more frequent than during later periods. Increase in population density of larvae leads to decrease in larval movements. Periodical larval movements with returning to initial position have been observed. This suggests that larvae possess a well-developed ability for spatial orientation. In *C. splendens*, motivations and dependence of larval movements on the intraspecific relations between larvae differ from those described for other Zygoptera.

- (6140) McALISTER, W.H. & M.K. McALISTER, 1987. *Guidebook to the Aransas National Wildlife Refuge*. Mince Co Press, Victoria, Texas. 289 pp. — ISBN 0-9618448-0-9. — Price: US \$ 9.- — (Available from the Publishers: Rt 1, Box 95 C, Victoria, Texas 77901, USA).
The reserve lies on the outer perimeter of the Gulf Coastal Plain, Texas. *Celithemis eponia* and *Sympetrum danae* are listed on pp. 215-216.
- (6141) MEIN, G., 1987. Sharp-eyed dragonflies [...] *The Press, Christchurch* (NZ), issue of Sept 4, p. 21. — (c/o Dr R. Rowe, Dept Biol., James Cook Univ., Townsville, Quid 4811, AU).
A long account on the New Zealand dragonflies and on their student, Dr Richard Rowe, published in a local daily, on the occasion of the appearance of his book on the subject (*OA* 5951). Also included are col. portraits of Dr Rowe, and of *Xanthocnemis zealandica*, *Uropetala chiltoni*, *Hemianax paupensis* and *Procordulia grayi*.
- (6142) *NEWSLETTER [OF THE] BRITISH DRAGONFLY SOCIETY*, No. 12 (Winter, 1987). — (c/o Mrs J. Silsby, 1 Haydn Av., Purley, Surrey, CR2 4AG, UK).
There are 8 (groups of) news items, incl. a communication from the President (*P.S. Corbet*), information on BDS car stickers (available from the Secretary at £ 0.70), report of the Dragonfly Conservation Group *P.S. Corbet* and reports on the Field Trips (*P. Allen*, *S. Jones*, *N. Shennan*) and on the 1987 Indoor Meeting (*G. Vick*). A new section, titled "News items from members" and edited by *A. Paine* (3 a Burnham Close, Trimley St Mary, Suffolk, IP10 0XJ, UK) contains, among others, records of adult *Aeshna cyanea* (Surrey, Dec. 14, 1985) and adult *Sympetrum striolatum* (Suffolk, Jan. 23, 1983). The *Abstracter* believes that the one of *A. cyanea* may represent the very latest seasonal record of this sp. outside the Mediterranean area (provided it is not due to an abnormal emergence, conditioned by thermal pollution of the breeding habitat), while that of *S. striolatum* may confirm the suggestion made first by G. Du Plessis (1868, *Mitt. schweiz. ent. Ges.* 2(8): 313-321) and subsequently repeated by several workers (though none has ever produced any firm evidence) that this sp. may occasionally hibernate at the adult stage.
- (6143) NIEVERGELT, B. & T. SCHEURER, 1987. *Methodik und Forschungsfragen zur Langzeitbeobachtung im Schweizerischen Nationalpark. Arbeitsber. Natn. Parkforsch.* 6: 1-44. — (First Author: Ethol. & Wildforsch., Univ. Zürich, Irchel II, Winterthurerstr. 190, CH-8057; — Second Author: Abt. Kulturgeogr., Geogr. Inst., Univ. Bern, Hallerstr. 12, CH-3012 Bern).
On pp. 38-39, references are made to the odonotol. projects in the Swiss National Park.
- (6144) NYFFELER, M., D.A. DEAN & W.L. STERLING, 1987. Predation by Green Lynx spider, *Peucetia viridans* (Araneae: Oxyopidae), inhabiting cotton and woolly croton plants in East Texas. *Environ. Ent.* 16(2): 355-359. — (Dept Ent., Texas A & M Univ., College Station, Texas 77843, USA).
68 catches, referable to 8 insect orders and to other araneids, were examined. Only 1 of these was a dragonfly (1.5% of prey). The name is not stated.
- (6145) OCHARAN, F.J., 1987. Nuevos datos sobre los odonatos de Menorca (Espana). *Bol. real Soc. esp. Hist. nat.* (Biol.) 83(1/4): 155-161. (With Engl. s.). — (Depto Zool., Fac. Biol., Univ. Oviedo, Oviedo, Spain).
A list is given of 14 spp., collected on Menorca in July, 1983. *Aeshna affinis* is reported for the first time from the Balearic Islis. The morphology and biology of *Calopteryx haemorrhoidalis* and *Coenagrion coerulescens* are briefly recorded.
- (6146) OTT, J., 1987. *Etho-ökologische Untersuchungen an Libellen einer Kiesgrube*. Diplomarbeit Univ. Kaiserslautern. Frontispiece, 91 pp., 13 tabs excl. — (Fachber. Biol., Univ. Kaiserslautern, Erwin-Schrödinger-Str., Postfach 3049 D-6750 Kaiserslautern, FRG).
The odon community (29 spp.) of a gravel pit nr Ludwigshafen, FRG, was studied during

1985-1986, with special reference to autecology and behaviour of all spp. The locality harbours a large and stable breeding population of *Crocothemis erythraea*, which does not seem to have been affected by 2 unusually severe winters. Its biology was studied in detail and it is suggested to include the sp. on the list of taxa autochthonous in Germany. Significant original observations are presented for a number of *Zygoptera* and *Anisoptera*, and compared with the published record.

- (6147) PETERS, G., 1987. *Die Edellibellen Europas. Aeshnidae*. A. Ziemsen-Verlag, Wittenberg-Lutherstadt (Neue Brehm Bücherei No. 585), 140 pp., col. pls excl. — ISBN 3-7403-0050-7. — Available also from the SIO Central Office, Biltoven, — (Author Mus. Naturk., Humboldt-Univ., Invalidenstr. 43, DDR-1040 Berlin, GDR).

This is a commercially published monograph on all what is known on the European Aeshnidae containing a wealth of original observations and ideas. The following are the main chapters: "The position of the aeshnids in the Anisoptera" (pp. 7-12), "The genera and their species" (pp. 12-116), "Considerations on phylogenetic affinities" (pp. 116-126), and "The aeshnids in the world of man" (pp. 126-130). The spp. "monographically" dealt with are *Aeshna affinis*, *A. mixta*, *A. caerulea*, *A. juncea*, *A. subarctica*, *A. crenata*, *A. osiliensis*, *A. grandis*, *A. viridis*, *A. cyanea*, *Aniciaeschna isosceles*, *Anax imperator*, *A. parthenope*, *Hemianax ephippiger*, *Boyeria irene*, *Caliaeschna microstigma*, and *Brachytron pratense*. — The only other book on the palearctic Aeshnidae is that on the Japanese species, by K. Inoue (OA 2562), but the style, scope and aim of the present work are completely different. While the Japanese book aims at the general readership, the present work is basically a technical monograph, directed at the specialised (though not necessarily strictly odonatological), reader. In some aspects it is remotely comparable with the classical monographs by E.M. Walker (1912, *The North American dragonflies of the genus Aeshna*. Univ. Toronto Stud.) and P.C. Calvert (1956, *The neotropical species of the "subgenus Aeschna"*

sensu Selysii, 1883. Mem. Am. ent. Soc. 15), but it is mainly concerned with biology, behaviour, biogeography (and even biometry of spp. and populations) rather than with classical taxonomy, though excellent keys to adults and larvae are provided. The phylogenetic considerations, based on this evidence, are particularly valuable, and many of the views expressed are most refreshing.

- (6148) POSTNER, M. & E.-G. BURMEISTER, 1987. Libellenbeobachtungen im Norden Münchens (Insecta, Odonata). *NachrBl. bayer. Ent.* 36(4): 114-115. — (Kreuzstr. 7, D-8046 Garching, FRG).

A brief account of the odon. fauna (20 spp.) of a locality at Oberscheissheim nr München is given. Of particular interest are notes on *Coenagrion mercuriale*. In 1987, this sp. was on wings during July 11 through Sept. 12. The unusually prolonged adult season is tentatively ascribed to the peculiar weather conditions prevailing in summer 1987.

- (6149) REHFELDT, G., 1987. Wirkung von Tal-sperren und Gewässerbelastung auf Invertebratengesellschaften in Fließgewässern und Auen des Harzes. *Arch. Hydrobiol.* 111(2): 255-281. (With Engl. s.). — (Zool. Inst., Univ. Braunschweig, Pockelsstr. 10a, D-3300 Braunschweig, FRG).

The effects of impoundments and water pollution on the macro invertebrate communities of the Innerste and Oker Rivers and their backwaters (Harz Mts, F.R. Germany) are discussed with particular reference to Ephemeroptera and Plecoptera. The odon. community structure of the lowlands and its changes caused by the 1980-1983 floods are also described.

- (6150) RETTIG, K., 1987. Naturkundliche Herbstbeobachtungen 1987 im Südschwarzwald nebst Umgebung (Baden-Württemberg). *Beitr. Vogel- Insektenwelt Ostfrieslands* 29: 10-19. — (Danziger Str. 11, D-2970 Emden, FRG). 5 common spp. are listed from southern Black Forest, southern Germany. Of particular interest is the exceptionally late seasonal record of *Calopteryx splendens* (29-IX-1987).

- (6151) RIETSCHER, S., 1987. Berühren verboten, vernichten erlaubt. *Carolinea* 45: 5-6. — (Author's address not stated).

Critical considerations on the German Species Conservation Act of Dec 1986 and on the new edition of the Federal Nature Conservation Act of March 12, 1987, containing a passing reference to the Odon. (Cf. also OA 3112).

- (6152) RÜPPELL, G., R. RUDOLPH & H. HADRY, 1987. *Argia moesta* (Coenagrionidae): Verhalten bei der Eiablage in der Gruppe. *Publ. wiss. Filmen* (Biol.) 19(20): 1-9. (With Engl. & Fr.s's). — (Zool. Inst., Techn. Univ. Braunschweig, Pockelsstr. 10a, D-3300 Braunschweig, FRG).

Explanatory text for Film No. E-2997 (Inst. Wiss. Film, Göttingen; 16 mm, black-and-white, silent, duration not stated). Individual ovipositing tandems and mass oviposition during which solitary males attack flying tandems, are shown. Many of the shots are slowed down by a factor of 10 or 20. — The publication is concerned with the distribution and habitat, male behaviour, tandem and copula, oviposition sites, mass oviposition, and with the attacks of the solitary males. — The film was made in Sept. 1987, in Texas, USA.

- (6153) SANDHALL, A., 1987. *Trollsländor i Europa*. — [*The dragonflies of Europe*]. Interpublishing, Stockholm. 251 pp., 325 col. phot. & 386 line drawings incl. [ISBN 91-86448-18-8]. (Hard cover, 18x26.5 cm). — Price: Skr 360.- net. (Swedish). — (Author: Bygglövsgränden 9, S-222 47 Lund). Also available from the SIO Central Office, Bilthoven.

This is a splendid "photographic monograph" on European dragonflies, by one of the most prolific insect photographers (for his other odonatol. work cf. OA 1091, 1147, 1189, 1742, 2849, 2850). Parts of the text were contributed by Dr U. Norling (Lund) and Dr P. Nielsen (Copenhagen), and some of the photographs by Dr U. Norling, Dr G. Sahlén (Uppsala), H. Heidemann (Bruchsal), Prof. Dr G. Jurzitza (Karlsruhe) and Dr I. Bucciarelli (Milano). Brief chapters (all heavily illustrated) on paleontology, morphology, behaviour, biology

and life history (pp. 9-69) are followed by accounts on over 90 spp. (pp. 70-208). For each sp. a general description and biological characterisation are provided along with a (partial) distribution map and several outstanding field portraits (usually at x2 nat. size). The latter include a number of nordic and mediterranean taxa, of which no col. phot. were ever published (*Coenagrion johanssoni*, *Gomphus graslini*, *Paragomphus genei*, *Boyeria irene*, *Aeshna crenata*, *A. serrata*, *Macromia splendens*, *Oxygastra curtisi*, *Orthetrum ramburi*, and the European *Trithemis annulata*). Save for *C. hylas*, all phot. are documented by adequate locality data. The concluding chapters of the book are dealing with folklore (with the emphasis on Fennoscandia), collecting, preparation, photographing field studies, and contain a selected reference list (pp. 209-215). A pictorial key to the adults (pp. 216-237), a checklist of Swedish, Engl., Germ. and Fr. vernacular names, and a subject index are also provided. — (*Abstracter's Note*: Although the volume of recently published "photographic" works on the European fauna is considerable, this book is unique in many features and the technical reproduction of photographs is generally superb. Mr Sandhall (a mathematician by profession) is indisputably one of the world "top group" of dragonfly photographers. It is most unfortunate that out of these "odonatologists-artists" only the work of those resident in Europe and Japan is well known to the general public, since only in these parts of the world it is possible, for the time being, to publish commercially available books on this subject. In North America, where there are several superb dragonfly photographers (e.g. Dr D.R. Paulson, Seattle), the general attitude of the public towards this type of entomological work is apparently prohibitive for commercial publication of any high standard photographic work. Even the few existing North American entomological "field guides" (mostly published by the Audubon Sec. and in the Peterson Field Guide Series) are largely inferior in scope, coverage and technical reproduction to similar works published recently in huge numbers and with wide circulation in Europe and Japan).

- (6154) SCHNEIDER, W., 1987. The genus *Pseudagrion* Selys, 1876 in the Middle East — a zoogeographical outline (Insecta: Odonata: Coenagrionidae). *Proc. Symp. Fauna & Zoogeogr. Middle East Mainz* (1985), pp. 114-123. — (Inst. Zool., Univ. Mainz, Postfach 3980, Saarstr. 21, D-6500 Mainz, FRG).
The genus is represented in the Middle East by 7 spp. All but one of these are identical or closely related to taxa widely distributed in continental Africa. The taxonomic heterogeneity suggests a formerly greater diversity of this genus in the Middle East. 2 main foci of endemism may be identified: the Levant and the mountain ranges of SW Arabia. The spp. composition in these 2 regions is more closely related to that of E Africa (Somalia, Ethiopia) than to that of Egypt. It may be concluded, therefore, that the colonization of the Levant took place along the Rift system (Red Sea coast of Arabia) rather than via the Nile and the Sinai. The particular pattern of relict distribution and absence from the lower Nile are also shared by other Middle East Odon. with African affinities.
- (6155) SIEDLE, K. & J. SPÄTH, 1987. Die Pokalazurjungfer (*Cercion lindenii*). — eine neue Libelle für Württemberg. *Jh. Ges. Naturk. Württ.* 142: 293-295. — (First Author: AG Stoffwechselphysiol., Univ. Frankfurt, Siesmayerstr. 70, D-6000 Frankfurt/Main-11, FRG; — Second Author: Lehrst. Zoophysiol., Univ. Tübingen, Auf der Morgenstelle 28, D-7400 Tübingen, FRG).
A review is given of the known records of *C. lindenii* in Württemberg, southern Germany, almost all of which originate from gravel pits.
- (6156) SINGER, F., 1987. Interspecific aggression in dragonflies — a perceptual constraints hypothesis. *Am. Zool.* 27(4): 49A [Abstract only]. — (Dept Biol., Univ. Minnesota, Minneapolis, Minnesota, USA).
[Verbatim]: Male *Leucorrhinia* defend territories from conspecific and heterospecific intruders. Defense against heterospecifics is surprising, as mating and oviposition are the only activities that occur on the territories, and heterospecific males are not expected to pose a reproductive threat. Why don't these dragonflies distinguish between conspecific and heterospecific intruders? It is proposed that males cannot afford to hesitate when an intruder enters a territory, because any hesitation will reduce the probability of winning the ensuing conflict. Thus there exists a trade-off between assessment cost incurred when the intruder is a conspecific, and the benefit gained from avoiding conflict if the intruder is a heterospecific. Given this tactical cost, it is predicted that males will defend against all intruders when the encounter rate with conspecifics is high. Conversely, a sp. that rarely encounters conspecifics will show some evidence of species discrimination. Field observations are in accord with these predictions.
- (6157) SIOJA. [Information Bulletin of the SIO National Office in Japan], Osaka, 1987, No. 2 (Nov. 15). (Jap.). — (c/o K. Inoue, 5-9, Fuminosato 4-chome, Abeno-ku, Osaka, 545, JA).
Contains a few membership administration items and a list of recently published odonatol. books and some reprint series available from the SIO Antiquarian Department.
- (6158) SUZUKI, K., 1987. Geographical distribution of *Mnais* damselflies (Odonata, Calopterygidae) in the Island of Hokkaido, North Japan. *J. Coll. liberal Arts Toyama Univ. (nat. Sci.)* 20(1): 1-15, col. pls 1-2 excl. (With Jap. s.). — (Dept Biol., Coll. Liberal Arts & Educ., Toyama Univ., 3190 Gofuku, Toyama, 930, JA).
Only *M. costalis* is widely distributed in the island (♂-f. *costalis*, ♂-f. *ogumai*, ♀-f. *asahinai*). The incidental occurrence of a large heterochromatic orange-winged male form, similar to ♂-f. *nawai* of *M. nawai* (occurring in SW Japan) is discussed, and a synopsis of the geographic distribution of the 4 *Mnais* spp. in Japan is presented, based on the recently gathered data.
- (6159) SUZUKI, K., 1987. *Together for peace and conservation of the natural ecosystems! Request for support.* Privately issued by the author & circulated by the SIO. 6 pp. — (Dept

Biol., Coll. Liberal Arts & Educ., Toyama Univ., 3190 Gofuku, Toyama, 930, JA).

An appeal for the support to the author's attempts for conservation of the Imizu Hills ecosystem (Toyama pref., Japan), with an annotated list of 58 odon. spp. reported from the region.

- (6160) SUZUKI, K., H. NEGORO, N. ITAKURA & H. KAWAZOE, 1987. The odonate fauna of Toyama prefecture, Hokuriku district, Honshu, Japan. (Supplement). *Bull. Toyama Sci. Mus.* 11: 77-122, pls 1-4 excl. (Jap., with Engl. s.). — (First Author: Dept Biol., Coll. Liberal Arts & Educ., Toyama Univ., Gofuku 3190, Toyama, 930, JA).

This is a supplement to the paper listed in OA 5301. *Aeschnophlebia anisoptera* is new to the prefecture, and *Lyriothemis pachygastra* should be deleted from the prefectural list. Additional data are presented for 60 spp., supplementary distribution maps are given for 58 of them, and for most spp. additional notes are provided on biology, biogeography and on behaviour. Some conservancy aspects are also discussed.

- (6161) TABARU, N., 1987. Life history of *Epiophlebia superstes* in Kyushu. *Insectarium, Tokyo* 24(11): 340-343. (Jap., with Engl. title). — (1029 Shiromotocho, Hitoyoshi, Kumamoto, 868, JA).

Contains brief characterisation of all instars.

- (6162) TERZANI, F., 1987. Segnalazioni faunistiche italiane. N. 111. *Gomphus vulgatissimus* (L.) (Odonata Gomphidae). *Boll. Soc. ent. ital.* 119(2): 125. — (Mus. Zool., Univ. Firenze, Via Romana 17, I-50125 Firenze).
First record from Liguria.

- (6163) TOMBO. *ACTA ODONATOLOGICA*. Published by the Society of Odonatology, Tokyo. Vol. 30, Nos 1/4 (dec. 25, 1987). — (c/o Dr S. Asahina, Takadanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA). *Eda, S.*: A male of *Agrioterpe* Asahina, at Iyari Marsh, Omachi, Nagano Prefecture (frontispiece phot.); — *Asahina, S. & D. Dudgeon*: A new platystictid damselfly from Hong Kong (pp. 2-6; — Pro-

tosticta taipokauensis sp. n. from Tai Po Kau Forest, New Territories; both sexes and larva); — *Asahina, S.*: A revised list of the Odonata of Hong Kong. Part I. Zygoptera (7-24); — *Matsuki, K.*: Descriptions of the larvae of four species of the genus *Anax* in Taiwan (Odonata: Aeshnidae (25-32); — *Arai, Y.*: Descriptions of the immature larvae of *Gynacantha japonica* Bartenef (33-35); — *Asahina, S.*: Paddy-field Odonata from western Java (35); — *Fukui, M.*: Records of interspecific hybrid between *Libellula quadrimaculata* asahinai and *L. angelina* (36-43); — *Asahina, S.*: Late-season dragonflies of Tokyo area (43); — *Sonehara, I.*: Observations on the dragonfly species artificially introduced or naturally established in a man-made pond (44-46); — *Uemura, Y.*: Record of *Ischnura elegans* from Lake Akanko, Hokkaido (46); — *Shiraishi, K.*: Territory setting of *Hydrobasileus croceus* (46); — *Yabu, S.*: Studies on the pioneer dragonflies to standing waters (47-50); — *Eda, S.*: Hybrid (?) *Anax* in copula shown on TV (50); — *Watanabe, K.*: *Brachydiplax chalybea flavovittata* in Ishigaki Island (51-52); — *Kurata, M.*: A new record of *Ischnura senegalensis* (Rambur) from Nagano Prefecture (52); — *Eda, S.*: The 30th Anniversary Meeting of the founding of the Society (53).

- (6164) TURRIAN, F., 1987. Intérêt faunistique d'un milieu en friche, les anciennes gravières de Verbois, Genève. *Bull. Soc. neuchâtel. Sci. nat.* 110: 71-88, pl. 4 excl. (With Germ. & Engl.s's). — (Inst. Zool., Univ. Neuchâtel, 22 ch. de Chantemerle, CH-2000 Neuchâtel-7).
23 odon. spp. are listed from a gravel pit area nr Geneva, Switzerland. *Calopteryx virgo*, *Erythromma viridulum*, *Cordulegaster boltoni* and *Crocothemis erythraea* are of some local interest.

- (6165) VERSCHUREN, D., 1987. Modified setae on a rheophilous dragonfly larva (*Cordulegaster*, Odonata) as tactile receptors of water current during prey detection. *Annls Soc. roy. zool. Belg.* 117(2): 264 [Abstract only]. — (Lab. Anim. Ecol. Univ. Gent, Ledeganckstraat 35, B-9000 Gent).
[Verbatim]: Studying larval morphology with

SEM, a wide range of modified setae was found on various bodyparts of *Cordulegaster* larvae. The most common type, covering almost the entire upper side of head and forelegs, is flattened, stiff and fan-shaped. The previous assumption that they are used in the cleaning of eyes and mouthparts is rejected. Rather, these setae are tactile receptors. Like many other types of sensory structures in Insecta, they originate by differentiation of hairs. — A combined analysis of larval habitat and behaviour on the one hand, and development of sense-organs on the other, was conducted on ten dragonfly species. It revealed that the occurrence of flattened setae on the upper side of the head is related to a lotic habitat of the larvae. As these setae mainly occur on those parts of the body which remain at the sediment surface in buried preying posture, they can be regarded as a kind of water current receptors which function during prey detection. — Controlled experiments in an aquarium showed that *Cordulegaster* does not show a preceding behaviour of orientation in the water current (rheotaxis) before adopting the preying posture. The rheoreceptors are found to play a more direct role in prey detection, which in dragonfly larvae consists of a combination of visual preception and the sensing of vibrations in the water that are generated by the moving prey. The minor importance of visual stimuli was demonstrated by a blinded larva, striking a prey animal. However, the tactile stimulus information that is received by the antennae is likely to be deformed by the water current. By the detection and interpretation of minute differences in time or amplitude of stimulation of the many, spatially separated rheoreceptors, the accuracy of gauging and locating prey animals in *Cordulegaster* is enhanced.

- (6166) *WALKERIA*. Newsletter of the Canadian National Office of the International Odonatological Society, Vancouver, Vol. 2, No. 2 (Dec. 1, 1987). — (c/o Dr S. Cannings, Dept Zool., Univ. British Columbia, 6270 University Blvd, Vancouver, B.C., V6T 2A9, CA).

Baker, R.: Statement on the current personal research (p. 5); — *Hellebuyck, V.*: Statement on the current personal research (5); —

Cannings, R.: Dragonflies in the Western Chilcotin — 1987 (6-7); — (*Anonymous*): "Dragonflies of B.C." out of print (7); — Ninth International Symposium of Odonatology (7); — *Conrad, K.F.*: Complementary male and female mating strategies of *Argia vivida* Hagen (Odonata: Coenagrionidae): an example of female-control mating system [= abstract of an MSc thesis] (7-7); — *Cannings, S., R. Lyons and B. Anholt*: [Various individual requests to the membership].

- (6167) WALLACE, J.B., T.F. CUFFNEY, C.C. LAY & D. VOGEL, 1987. The influence of an ecosystem-level manipulation on prey consumption by lotic dragonfly. *Can. J. Zool.* 65(1): 35-40. (With Fr. s.). — (First Author: Dept Ent., Univ. Georgia, Athens, GA 30602, USA).

Pesticide application to a small headwater stream (treatment stream) resulted in massive invertebrate drift and altered community structure with respect to both biomasses and densities. The community changed from one dominated by insects to one of primarily non-insects. Insects represented 71 to 78% of total abundance and about 95% of total biomass in an adjacent reference stream during 2 years of study. During the initial treatment year, insects, mainly Chironomidae, composed less than 20% of total invertebrate biomass (< 10% of abundance) in litterbags in the treatment stream. Within 2 years of the initial disturbance, invertebrate biomass in the treatment stream was again by insects (90% of total) although insects represented only 36% of total abundance. *Lanthus vernalis* Carle (Gomphidae) was among the insect taxa least affected by the treatment. Diets of larval *Lanthus* (gut analyses) reflected changes in community structure within the treatment stream, with insects representing only 13% of the prey during the initial treatment year and more than 82% during the 2nd year of recovery. In contrast, *Lanthus* in the reference stream consumed primarily insects (73 to 78%) in both years. These data indicate that generalist predators such as *Lanthus* can readily shift to alternative prey when confronted by massive changes in community structure. The

results suggest that this disturbance reduced the abundance of the more profitable prey to a level where less profitable prey increased in the diet. Following the disturbance, *Lanthus* consumption reflected the recovery of more profitable prey in the environment. Secondary production of *Lanthus* approached 27% of average standing stock biomass of invertebrates in litterbags in each stream and, based on literature values for bioenergetic efficiencies, *Lanthus* consumed about 65% of the average standing stock biomass of invertebrates. Total consumption necessary to support production of all invertebrate predators may exceed the average standing stock prey biomass by 2.5 to 2.7 times. However, when prey turnover is considered, the potential impact of this predation on invertebrate community structure may be quite modest.

- (6168) WEICHSEL, J.I., 1987. *The life history and behavior of Hetaerina americana (Fabricius) (Odonata: Calopterygidae)*. PhD thesis, Univ. Michigan. 208 pp. — Microfilm or xerox copy available from University Microfilms International, Dissertation Copies, P.O. Box 1764, Ann Arbor, Mich. 48106, USA; — Order No.: ADG87-12239.8708.

[Verbatim abstract]: Adults spend their adult lives along margins of streams. Average life span in nature is one week. They are active from late May until early October in southern Lower Michigan. — Males perch near patches of submerged vegetation in which females lay eggs. Males just at sexual maturity are likely to disperse from the area where they emerged. Mature males defend perches from other males through agonistic flights. Territorial males perch closer to the surface than mature females during daily hours of sexual activity: noon to 5:00 pm. — Tandem pairs form near the water surface at stream margins. Pairs copulate and fly to potential oviposition sites in tandem. As a female submerges on vegetation, she separates from the male, which usually perches nearby. Previous mates are most likely to clasp receptive surfacing females in tandem. — Males and females are apparently unable to evaluate specific oviposition sites from above the water; females appear to find them through

trial and error by submerging at different locations. — Territorial males perched within a few inches of the water surface and were widely dispersed. Lowest perching males were most strongly perch attached. Low perches were significantly associated with copulation success. Perch attachment was strongest, and size of area occupied was smallest, with oviposition sites in the occupied area. Among males with oviposition sites in their areas, more strongly perch attached males had higher reproductive success. Males with oviposition sites in their areas may have achieved enhanced reproductive success through increased probability of remating if females surfaced, thus fertilizing more eggs deposited in more places. Females mated whether or not males had oviposition sites in their perch areas, and oviposited in areas occupied by their males only about 30% of the time. Males apparently do not control access of females to oviposition sites, as in some damselflies. — It is hypothesized that territoriality is initially concerned with intercepting females as they fly to peripheries of large patches of submerged vegetation. Males with territories actually containing oviposition sites are more territorial and achieve greater reproductive success than males in areas that lack them.

- (6169) ZESSIN, W. & J. ANSORGE, 1987. *Magnasupplephlebia intercalaria* n. sp. — eine neue Anisozygopterenart aus dem oberen Lias von Mitteleuropa (Insecta, Odonata). *Dt. ent. Z. (N.F.)* 34(4/5): 383, 386, pl. 9. (With Engl. s.). — (First Author: Thälmann Str. 30, DDR-2754 Schwerin, GDR).
M. intercalaria sp. n., from Upper Lias (Lower Toarcium) of Dobbertin (Mecklenburg, Germany) is described, figured and discussed. The holotype is in the coll. Jörg Ansoerge (Gdansk Str. 32, DDR-2520 Rostock, GDR). The diagnosis of *Magnasupplephlebia* Zessin, 1982 (cf. OA 4022) is redefined on the basis of the new interpretation of dragonfly wing venation, as suggested by Riek & Kukalova-Peck (cf. OA 4786).
- (6170) ZHOU, W., 1987. *Calopteryx laosica*: new record from China. *Entomotaxonomia* 9(3):

248. (Chin., with Engl. title). — (Dept Ent., Zhejiang Mus. Nat. Hist., Gu-shan, Hang Zhou, P.R. China).

Local record.

1988

- (6171) (Anonymous), 1988. Symposium on odonatology. *The Hindu*, issue of Jan. 20, p. 3. Daily's note on the inauguration (Jan. 19, 1988) of the ninth International Symposium of Odonatology, held under the auspices of the Madurai Kamaraj University, southern India. — (The opening ceremonies were broadcasted by the All-India Television on Jan. 19).

- (6172) *ABSTRACTS OF PAPERS read at the Ninth International Symposium of Odonatology*, Madurai, 1988. Edited by S. Mathavan. Issued by the Societas Internationalis Odonatologica (S.I.O.), Madurai, 58 pp. — Price: Hfl. 40.- (incl. the Field Trip Handbook; cf. OA 6173). — (c/o SIO Central Office, P.O. Box 256, NL 3720 AG Bilthoven).
- Tyagi, A.*: Dragonflies in folklore of India (p. 9); — *Baird, J.M. & M.L. May*: Behavioural ecology of foraging by *Pachydiplax longipennis* (Anisoptera: Libellulidae) (9-10); — *Basalingappa, S., R.M. Gandhi Maralidhar & S.V. Modse*: Changes in the total lipid from the damselflies *Lestes elata* Hagen (Odonata: Lestidae) during different hours of the day (10-11); — *Basalingappa, S., S.S. Mathapatthi & R.M. Gandhi*: Rainlessness and its impact on the damselflies *Lestes elata* Hagen (Lestidae: Odonata) (11-12); — *Blois, C. & A. Cloarec*: Interindividual interactions and spatial distribution of *Anax imperator* Leach (Odonata: Anisoptera: Aeshnidae) larvae (12-13); — *Chowdhury, S.H. & C. Chakaraborty*: Developmental biology of *Brachydiplax sobrina* (Rambur) (14); — *Jacquemin, G.*: The peat-bogs in the Vosges (North-eastern France) and their dragonfly fauna (14-15); — *Johnson, D.M.*: A ten-year study of the odonate assemblage of Bays Mountain Lake (15-16); — *Joseph, K.J. & A.R. Lahiri*: Exclusively female associated dormitories in the circadian roosting behaviour of the dragonfly *Potamarcha congener* (Rambur) (Odonata: Anis-

optera) (16-17); — *Khan, M.W. & T.B. Tembhare*: Studies on the midgut in relation to absorption and digestion in the nymph of the dragonfly *Pantala flavescens* (Fabr.) (Anisoptera: Libellulidae) (18); — *Kulshrestha, A.K. & A.K. Kulshrestha*: Morphological studies of head capsule and mouth parts of *Ceriagrion coromandelianum* (Fabr.) (Coenagrionidae: Odonata) (19); — The organs of copulation and oviposition of *Ceriagrion coromandelianum* (Fabr.) (Coenagrionidae: Odonata) (19-20); *Lahiri, A.R.*: Some observations on the status of rare Indian odonate species (20-22); — *Mahato, M.*: A general survey of odonate larvae in Kali Gandaki and Narayani Rivers of central Nepal (22-23); — *Malhotra, R., R. Sandhu & S.S. Dhillon*: Chromosomal architecture of a male dragonfly from Patiala (24); — *Mathavan, S., S. Mahalingam & D.D.R. Premkumar*: Metabolism of endosulfan residues in *B. contaminata* nymphs (24-25); — *McMillan, V.*: Variable mate-guarding behaviour by male *Plathemis lydia* (25-26); — *Michiels, N.*: Reproductive strategies in *Symptetrus danae* (Libellulidae) (26-28); — *Miller, P.L.*: The functions of the sub-genital plates of female libellulid dragonflies (28); — *Mitra, T.R.*: Status of the Odonata recorded from the Indian parts of the Gangetic alluvium (29); — *Mittal, O.P. & S.M. Handa*: On the chromosome number and morphology in damselflies: a review (29-30); — *Muthukrishnan, J., A. Palavesam & M. Senthamizhselvan*: Satiation time and predatory behaviour of the damselfly nymph *Lestes elata* (30-31); — *Ott, J.*: Marking experiments with dragonflies (Odonata) (32); — *Palavesam, A., M. Senthamizhselvan & S. Beena*: Kinetic properties of phosphatase of dragonfly nymph *Mesogomphus lineatus* (32-33); — *Pilon, J.-G. & L. Pilon*: The odonate fauna of the northern regions of Quebec-Labrador: review and perspective (33-34); — *Prasad, M.*: Taxonomy of Indian Odonata: a review (34); — *Priichard, G.*: The life history of *Argia vivida* (Odonata: Coenagrionidae) at sites with different thermal regimes: the interaction between growth and diapause (35-36); — *Rehfeldt, G.*: Analyses of male-female interactions in *Platycypha caligata* (Zygoptera: Chlorocyphidae) (36-37); —

- Rüppell, G.: Flight and reproduction behaviour of Odonata from Texas and Panama (37); — Satvarani, I.: Studies of the odonates of Andhra Pradesh, India (37-38); — Schneider, W.: Zoogeography of Middle Eastern Odonata (39-40); — Siva-Jothy, M.T.: Recent advances in our understanding of dragonfly sperm competition (40); — Srivastava, V.K. & B.K. Srivastava: Morphohistology and the functional aspects of the components of "8th complex" in female *Ischnura rufostigma* Selys (Zygoptera: Coenagrionidae) (40-41); — Suribabu, B. & B.K. Srivastava: The reproductive behaviour of *Pseudagrion rubriceps* Selys (Zygoptera: Coenagrionidae) (41-42); — Tembhare, D.B. & R.J. Andrew: Development and structure of the post-ovarian genital complex of the dragonfly *Tamea virginia* (Rambur) (Anisoptera: Libellulidae) (42-43); — Structure of the secondary copulatory apparatus of the male dragonfly *Tamea virginia* (Rambur) (Anisoptera: Libellulidae) (43-44); — Thompson, D.J.: Sexual size dimorphism in the damselflies *Coenagrion puella* (44-45); — Utzeri, C. & G. Gianandrea: Aspects of territoriality in *Crocotemis erythraea* (Brullé) (Libellulidae) (45-47); — Utzeri, C. & L. Dell'Anne: The onset of territoriality in *Libellula depressa* L. (Libellulidae) (47-48); — Velpandi, A. & S. Mathavan: Antibacterial activity and selective synthesis of some haemolymph proteins in the dragonfly nymph *Brachythemis contaminata* (49); — Westfall, M.J.: A study of the genus *Dythemis*, with descriptions of two new genera (Odonata: Libellulidae) [the genera are not named here] (49-50); — Yadwad, V.B. & V.L. Kallapur: $\text{Na}^+ \text{K}^+$ ATPases in the rectal gills of the dragonfly nymph and its inhibition following the endosulfan treatment (50-51); — Palanichamy, S., P. Baskaran, M. Vasanthi & S.M. Ali: Studies on the midgut protease in the dragonfly nymph *Brachythemis contaminata* exposed to pesticides (53); — Lakshminarayana, K.V. & A. Kumar: On two new Jurassic fossil Odonata from Solnhofen Limestone deposits [*Stenophlebia handlirschi* sp. n. and *Euphaeopsis hageni* sp. n. are nomina nuda] (54); — Roy, S.P.: Use of odonate larvae in the evaluation of water quality of freshwater ecosystem (54-55); — Saxena, S.C. & R.K. Kaushik: Safety evaluation of chemicals from insects control against the nymphs of odonates (55-56); — Ahmed, A.K.Z. & R. G. Michael: Some biological parameters of Odonata larvae of fishponds (57). — On p. 52, appear the titles (without abstracts) of 2 posters by Pilon, J.-G.: Larval morphology of *Libellula julia* Uhler (Anisoptera: Libellulidae); Intrastage variation during post-embryonic development of *Libellula julia* Uhler (Anisoptera: Libellulidae).
- (6173) *FIELD TRIP HANDBOOK of the Ninth International Symposium of Odonatology*, Madurai, 1988. Compiled by P.L. Miller, issued by the Societas Internationalis Odonatologica (S.I.O.), Madurai, 14 pp. — Price: Hfl. 40.- (incl. the Abstracts booklet; cf. OA 6172). — (c/o SIO Central Office, P.O. Box 256, NL-3720 AG Bithoven). Contains a brief description (topogr. map incl.) and a preliminary list of the odon. fauna of the Periyar Wildlife Reserve (alt. 900-2019 m), Kerala, southern India.
- (6174) LAMB, R., 1988. Dragonflies at Stratford. *Butterfly News* 16: 4. — (Author's address not stated). A note on the author's experiment to introduce some British coenagrionids in the Weston Park Butterfly Farm (Shropshire) and in that at Stratford-upon-Avon. At the Clive Farrell Farms, an experiment is scheduled with some tropical spp. from Belize.
- (6175) *LINDENIA*. Notiziario dell'Ufficio Nazionale Italiano della Società Odonatologica Internazionale, Roma. No. 9 (Jan. 1, 1988). — (c/o Prof. Dr C. Utzeri, Dipt Biol. Anim. & Uomo, Univ. Roma "La Sapienza", Viale dell'Università 32, I-00185 Roma). In addition to the traditional items (SIO management, census of the odonatol. collections & libraries in Italy, Italian faunistic literature), there is a notification on Prof. G. Carchini's participation in an Antarctic expedition, an article on Dr P.L. Miller's research visit to Rome (July 18-Aug. 17, 1987), etc. Of general interest will be the note on the entomological

equipment dealer, Giuliano Russo (C.P. 2076, I-40100 Bologna), who is the principal supplier in Italy, and also publishes price catalogues of the items available.

- (6176) MONTGOMERY, B.E., 1988. Odonatological bibliography of Frederick Charles Fraser. *Soc. int. odonatol. rapid. Comm.* (Suppl.) 7: VI+14 pp. — (Author deceased; copies available from the SIO Central Office, Bilthoven).

Over 300 titles (1917-1970), believed to be complete. — (*Abstracter's corrective note*: 2 printing errors could be detected: (1) 1953 b: should read "caerulea", and (2) 1956 i: should read "Gynacantha").

- (6177) PETERS, G., 1988. Beobachtungen an Aeshniden in Finnland (Odonata: Aeshnidae). *Opusc. zool. flumin.* 21: 1-16. (With Engl. s.). — (Mus. Naturk., Humboldt-Univ., Invalidenstr. 43, DDR-1040 Berlin, GDR).

Data on the habitat features of adult and larval *Aeshna osiliensis*, *A. crenata* and *A. caerulea*, on flight activity and on their coexistence with other *Aeshna* spp. are presented and discussed. Measurements of fresh *osiliensis* and *crenata* specimens are compared with those of *A. serrata*, and the difficulties in distinguishing *osiliensis* exuviae from those of *A. grandis* are pointed out. Significant differences in body size between members of various populations of *A. grandis*, caused by the environmental impact during larval growth, are brought on record. In Scandinavia, the northern range of *A. subarctica elisabethae* seems to coincide with that of the floating *Sphagnum* mosses.

- (6178) PINRATANA, A. [general author], B. KIAUTA [bibliography] & M. HÄMÄLÄINEN [nomenclature & corrections of fig. identifications], 1988. *List of the Odonata of Thailand and annotated bibliography*. Viratham Press, Bangkok. VI+18 pp., 20 col. pls excl. [ISBN none]. (Soft cover, 18.5x26 cm, with a cover phot.). — Price: US \$ 8.- net in Bangkok. Also available from the SIO Central Office, Bilthoven.

This is the first commercially available booklet on the Odon. of a Southeast Asiatic country,

not considering Fraser's volumes in the Fauna of British India, which have an entirely different scope, level and purpose. It was prepared by Dr h. c. Bro. A. Pinratana, Head of the SIO National Office in Thailand and Editor of the SIO Thai Newsletter, *Malangpo*. Upon his request, Dr Hämäläinen has checked the nomenclature and, in the proofs, corrected (some of) the fig. identifications. Prof. Kiauta provided a xerox copy of his annotated card file on the Thai bibliography, to which a few titles were added by Dr Hämäläinen. The col. pls show over 100 Thai spp., a good part of them taken in the field, the others are cabinet specimens. Most of them were provided by Dr Pinratana, a few (field portraits) by Dr Hämäläinen. In the checklist 267 spp. known to occur in Thailand, are listed and crossreferenced to the bibliography, which contains 121 titles. The figs will certainly give a reasonable taxonomic "orientation", particularly so in the case of taxa with distinct wing spots, and will thereby facilitate the work of Thai entomologists concerned with dragonflies. It is for this reason that Dr Pinratana has to be warmly congratulated on his "pioneer" initiative, though it is unfortunate that the "joint authors" did not know about their authorship beforehand; they were most kindly and largely undeservedly awarded this status by Dr Pinratana entirely "by surprise", and they (Dr M. H.) have seen the pls only at the production stage, when identifications could not be corrected on the pls themselves any more. Even so, the booklet is certainly a useful contribution to the local literature and it is hoped will encourage Dr Pinratana to prepare in the future a more complete field guide, when the important revisional work by Dr Asahina on the Thai fauna will have been completed. The cover photograph (swarming *Potamarcha* congener?) should certainly deserve a pl. reproduction in a following revised and enlarged edition, and statements on the dates and provenience of the photographed specimens would enhance the value of the photographic documentation.

- (6179) *PROGRAM AND GENERALITIES of the Ninth International Symposium of Odonata*

tology, Madurai, 1988. Compiled by S. Mathavan, issued by the Societas Internationalis Odonatologica (S.I.O.), Madurai, 32 pp. — (c/o SIO Central Office, P.O. Box 256, NL-3720 AG Bilthoven).

Symposium Officers (p. 5); — Acknowledgements (6); — Symposium location (7); — General informations (8-11); — Agenda [of the] General Business Meeting of SIO (12-13); — Scientific program (14-20); — List and addresses of participants (21-28); — Maps [of the Madurai University Campus and of the city of Madurai] (29-30). — For other publications of the Symposium cf. *OA* 6171, 6172, 6173, 6176, 6180.

- (6180) TYAGI, B.K., 1988. *An introduction to the activities of the S.I.O. National Office in India.* International Odonatological Society, Pondicherry. 38 pp. — Price in India: Rs1C 50.- (individuals), 75.- (libraries); all others: Hfl. 25.-. Orders to: Dr B.K. Tyagi, Vector Control Research Centre, Medical Complex, Indira Nagar, Pondicherry-605006, India; — or to the S.I.O. Central Office, P.O. Box 256, NL-3720 AG Bilthoven).

Upon a request by the Bangladesh and Nepalese membership, the name of the former SIO National Office in India has been changed by a sanction of the SIO Council (Jan. 21, 1988) into "SIO South Asian Regional Office", which is considered to better cover the scope of this very active SIO chapter, uniting administratively all countries from Pakistan in the West, to Burma and Sri Lanka in the East and South, including the Himalayan states of Nepal and Bhutan. The Office is governed by a Regional Council, headed by the Regional Representative, Dr B.K. Tyagi (address above). The day-to-day business is coordinated from Pondicherry, but a small office, headed by Dr S. Mathavan and Dr T.J. Pandian, and supported by a professional, SIO-paid secretary is to be located at Madurai Kamaraj University, and will be principally concerned with the administration of the SIO periodicals in India. The opening of SIO National Agencies in Bangladesh, Nepal and Pakistan is a long-term project, to be considered as the membership in these countries will in-

crease. — The membership administration of the countries in southwestern Asia and the Middle East is being currently taken care of by the SIO Central Office in the Netherlands, and that in southeast Asian countries (Burma, Thailand, "Indochina", Malaysia, Brunei) is covered by the SIO National Office in Thailand (Bangkok). — The present booklet gives a detailed account of organisation and activities of the former SIO National Office in India, as well as a brief outline of the general structure and various institutions of the SIO. It is directed at the SIO universal membership rather than at the regional members only and was published on the occasion of the Ninth Int. Symp. Odonatol. (Madurai, Jan. 1988).

- (6181) VAN TOL, J. & M. VERDONK, 1988. *The protection of dragonflies (Odonata) and their biotopes.* 181 pp., Council of Europe (Europ. Committee Conserv. Nature & natur. Resour.), Strasbourg. [Nature & Environment Ser., No. 38]. — [ISBN 92-871-1530-3]. Available also in French. — (Publishers: Pubs & Documents Div., Council of Europe, B.P. 431, R6, F-67006 Strasbourg).

This is the final report on the project, preliminary accounts on which were published in the papers listed in *OA* 5175, 5764 and 5880. It is a very thorough document, based on critical evaluation of the very voluminous literature on the Europ. Odon. and on evidence and suggestions supplied by 48 Europ. odonatologists. — "Europe", as considered here, encompasses the geographic Europe, without the USSR territories, and incl. Asiatic Turkey. The status of about 164 taxa (spp. & sspp.), indigenous to this territory, has been critically evaluated, 64 of these are here documented in detail (habitat, distribution, status, threat, conservation, notes on biology, selected references) and ranked according to the IUCN Red Data Book (cf. *OA* 4224, 5736). While the status of 2 spp. needs further study ("insufficiently known": *Calopteryx taurica*, *Sympecma annulata*), 13 taxa are considered "endangered" (*Aeshna viridis*, *Brachythemis fuscopalliata*, *Calopteryx syriaca*, *Coenagrion hylas freyi*, *C. mercuriale*, *Cordulegaster bidentatus sicilica*, *Ischnura intermedia*, *Leucorrhinia albifrons*, *L. caudalis*,

Macromia splendens, *Ophiogomphus c. cecilia*, *Oxygastra curtisi*, *Stylurus flavipes*), 22 are "vulnerable", and 26 are "rare". The inclusion of a taxon on one or more local or national red lists, does of course not as such warrant its inclusion in one of the lists of the present document, since the status outside Europe also had to be taken into account. Instead, 2 non-red-list categories are introduced, viz. "threatened in some parts of Europe" (14 taxa) and "rare in Europe" (22 taxa). Within the territory considered, the most interesting fauna occurs in SW France, in the Iberian and Balkan peninsulas, and in Asia Minor. The decline or widespread local extinction are particularly apparent among the taxa peculiar to

lakes, peatbogs, mesotrophic marshlands and rivers. The conservation of these, preferably by creation of large-scale nature reserves and national parks, is advocated. — This is an exceptionally valuable document and its periodic updating would be highly desirable. Even at the moment of its publication, some of the data are already out-of-date (e.g. on *C. hylas*). There are also some minor errors and omissions, incl. some relative to the citation of the national legislations, for example: in Austria all Odon. are protected also in Vienna (19 Oct. 1985), and the Swiss Act of 6 March 1979, "Verordnung über den Naturschutz", was promulgated by and has jurisdiction in canton Schaffhausen only (cf. *OA* 6006).