

ODONATOLOGICAL ABSTRACTS

1971

- (1572) BACHMAYER, F., N. SYMEONIDIS & D. THEODOROPOULOS, 1971. Einige Insektenreste aus den jungtertiären Süßwasserablagerungen von Kumi (Insel Euboea, Griechenland). *Praktika Akad. Athenon* 46: 11-20, Taf. 1-2. (With Greek s.). — (*Geolog.-Paläontol. Abt., Naturhist. Mus., Burgring 7, A-1014 Wien*).

A number of fossil insects from the Neogene freshwater deposits of Kumi, Euboea Island, Greece, are described and illustrated. Among these is a forewing (?) impression of an unidentified *Cholcopteryx* (?) sp. (*Calopterygoidea*). The original is in the collections of the Dept. Geol., Nat. Hist. Mus., Vienna, Austria (Acquisition No. 1880/C 848).

1974

- (1573) BAYANOV, M.G., 1974. Strekozy Bashkirii kak promezhutochnye hozyaeva gel'mintov. [Dragonflies of Bashkiria as intermediate hosts of helminths]. In: *Gel'minty zhivotnyh, cheloveka i rastenii na Yuzhnom Urale*. Tom 1, pp. 77-86. Bashkir Sect., USSR Acad. Sci., Ufa. (Russian). — (*Inst. Biol., Bashkir Sect., USSR Acad. Sci., 69 October Ave., USSR-425025 Ufa*). 393 larvae and 509 adults, referable to 12 odon. spp., were examined. 29.2% of larvae and 47.5% of adults were infested by helminths of various ontogenetic stages. The highest infestation by trematodean metacercariae was found in *Anax imperator*

(84.2% of specimens studied), and the highest infestation intensity in *Libellula quadrimaculata* (84 spec. per dragonfly). A table is given of the infestation degree of all odon. spp. In all, 1 nematode, 2 cestode and 7 trematode spp. were identified.

- (1574) JACQUEMART, S., 1974. Résultats de la Mission anthropologique Belge au Niger. Collemboles nouveaux du Sahara. *Bull. Inst. r. Sci. nat. Belg. (Ent.)* 50 (6): 1-46, pls. 1-9. — (*Inst. Roy. Sci. nat. Belg., Bruxelles, Belgium*).

On p. 25, larvae of *Crocothemis erythraea* and *Sympetrum fonscolombei* are recorded from the Lac d'Arrigui, Niger.

- (1575) KHALAF, A.N. & M.A. AL-OMAR, 1974. A second list of insects from Iraq. *Bull. Biol. Res. Cent. Publ. Baghdad* 2: 1-41. — (*Biol. Res. Center, Baghdad, Iraq*).

New acquisitions for the collection of the Biological Research Center, Baghdad, are listed. These include representatives of Coleoptera, Dermaptera, Diptera, Heteroptera, Homoptera, Hymenoptera, Lepidoptera, Mallophaga, Neuroptera, Odon., Orthoptera, Siphonaptera and Trichoptera, making a total of 293 spp., 64 of which are new for Iraq. — (*Abstracter's note: Pt. I, Kaddou, I.K., 1967. Check list of some insect fauna of Iraq. Bull. Biol. Res. Cent. Publ. Baghdad* 1: 1-34, does not contain any odon. records).

- (1576) LITVINENKO, N.M., 1974. Variation in the food composition of *Anas acuta* L. and

- Anas crecca L. caused by fluctuation of the water level in the Ilistaya River (Southern Primorye Territory). Proc. Inst. Biol. & Pedol. Vladivostok (NS) 17: 197-200. (Russian, with Engl. s.). — (*Inst. Biol. & Pedol., Far East Sci. Centr., USSR Acad. Sci., 159 Stoletiya Ave., USSR-690022 Vladivostok*).
- Larval Odon. were recovered from 5 stomachs of the wild duck, *A. acuta* (11 examined), and from 2 of *A. crecca* (29 examined).
- (1577) MUSHCHINSKIY, V.G., 1974. Donnaya fauna Gidigichskogo vodohranilishcha. [Benthic fauna of the Gidigich Reservoir]. In: Biologicheskie osnovy rybnogo hozyaystva respublik Srednei Azii i Kazahstana. Tom 1, pp. 88-90. Ylym, Ashkhabad. (Russian). — (*Moldavian Expl. Stn Fishery, 93 Kiev Str., USSR-277012 Kishinev*).
- 5 not further identified odon. spp. are mentioned for the reservoir, Byk River (tributary of Dniester), USSR.
- (1578) NECHAEV, V.A., 1974. On the biology of *Cyanopica cyanus* (Pall.) in Primorye Territory. Proc. Inst. Biol. & Pedol., Vladivostok (NS) 17: 120-135. (Russian, with Engl. s.). — (*Inst. Biol. & Pedol., Far East Sci. Centr., USSR Acad. Sci., 159 Stoletiya Ave., USSR-690022 Vladivostok*).
- Odon. remains were recovered from stomachs of 2 blue magpies, captured in autumn.
- (1579) NECHAEV, V.A., 1974. On the distribution and biology of some bird species in the lower reaches of the Amur River. Proc. Inst. Biol. & Pedol. Vladivostok (NS) 17: 145-154. (Russian, with Engl. s.). — (*Inst. Biol. & Pedol., Far East Sci. Centr., USSR Acad. Sci., 159 Stoletiya Ave., USSR-690022 Vladivostok*).
- Remains of adult dragonflies were recovered from 2 stomachs (out of 10 examined) of jays, *Garrulus glandarius*, captured in the second half of the summer.
- (1580) OKOROKOV, V.I. & V.A. TKACHEV, 1974. Zarazhenie lichinok strekoz gel'mintami na ozere Peschanoe v Chelyabinskoi oblasti. [Helminth infestation of dragonfly larvae of the Peschanoe Lake in the Chelyabinsk province]. In: Gel'minty zhivotnyh, cheloveka i rastenii na Yuzhnom Urale. Tom 1, pp. 142-144. Bashkir Sect., USSR Acad. Sci., Ufa. (Russian). — (*Dept. Zool., Chelyabinsk Pedagog. Inst., 69 Lenin Ave., USSR-454003 Chelyabinsk*).
- 2700 odon. larvae, referable to 7 spp., were examined by the compression technique. 3.3% of them were infested, and 1 nematode and 6 trematode spp. were identified.
- (1581) PERMINOV, L.G., 1974. The biology of pike-perch acclimatized in Misyash Lake. Izv. gosud. nauchno-izsled. Inst. ozern. rechn. rybn. Hoz. 92: 23-31. (Russian, with Engl. s.). — (*Lab. Lake Fishery, St. Res. Inst. Lake & River Fishery, 26 Admiral Makarov Quay, USSR-190053 Leningrad*).
- Larval Odon. were found in the stomachs of pike-perch of all ages in a lake in the Chelyabinsk province, USSR.
- (1582) SHKORBATOV, G.L., A.V. ZAHARENKO & A.G. VASENKO, 1974. Makrozoobentos vodoema — ohladitelya Zmievskei GRES, oz. Liman. [Macrozoobenthos of the Liman Lake — the cooling reservoir of the Zmievske Power Station]. In: Vliyanie teplovyh elektrostantsii na gidrobiologiyu i biologiyu vodoemov. Mater. 2 Simp., Borok, pp. 197-199. (Russian). — (*Fac. Biol., Kharkov Univ., 4 Dzerzhinskii Square, USSR-310078 Kharkov*).
- This is an abstract of a paper presented at the 2nd Symp. on the influence of thermal power stations on the biological regime of water bodies (Borok, Aug. 26-28, 1974). Larvae of 4 unidentified odon. spp. were detected in the lake, Kharkov province, USSR.
- (1583) SKAL'SKAYA, I.A., 1974. Zaselenie drev-esnyh substratov faunoi v podogrevaemoi i nepodogrevaemoi zone u Kostromskoi GRES. [Fauna on the wood substrata in the heated and in the unheated zones of the

Kostroma Power Station]. In: Vliyanie teplovykh elektrostantsii na gidrobiologiyu i biologiyu vodoemov. Mater. 2 Simp., Borok, pp. 165-168. (Russian). — (*Inst. Inland Water Biol., USSR Acad. Sci., USSR-152742 Borok, Yaroslavl prov.*).

This is an abstract of a paper presented at the 2nd Symp. on the influence of thermal power stations on the biological regime of water bodies (Borok, Aug. 26-28, 1974). In the heated zone (12.0-16.8°C) wood substrata were populated by larval Odon. within 2 days. In the cool-water zone the larvae appeared at a later date.

- (1584) ZAGUBIZHENKO, N.I., 1974. Donnaya fauna Krivorozhskogo vodohranilishcha GRES-2 v raione sbrosa podogretykh vod i za ego predelami. [Benthic fauna of the Second Krivoi Rog Power Station Reservoir within and outside the reach of the cooling waters]. In: Vliyanie teplovykh elektrostantsii na gidrobiologiyu i biologiyu vodoemov. Mater. 2 Simp., Borok, pp. 67-68. (Russian). — (*Inst. Hydrobiol. Dnepropetrovsk Univ., 15a Yulius Fuchik Str., USSR-320600 Dnepropetrovsk*).

This is an abstract of a paper presented at the 2nd Symp. on the influence of thermal power stations on the biological regime of water bodies (Borok, Aug. 26-28, 1974). Larvae of a single, unidentified odon. sp. were found in the benthic fauna of the reservoir.

- (1585) ZIMBALEVSKAYA, L.N., 1974. Certain features of structure of fresh-water phytophilous invertebrate communities. *Gidrobiol. Zh.*, Kiev 10 (6): 38-46. (Russian, with Engl. s.). — (*Inst. Hydrobiol., Ukrain. Acad. Sci., 44 Vladimirska Str., USSR-252003 Kiev*).

The oxygen consumption of populations of different spp. was studied in the Dniepr river-bed communities and in those of water bodies of its flood plain, USSR. The size of specimens of different spp. and the values of their respiratory metabolism, as a rule, vary within the same community. Whenever this is not the case, the spp. in-

cluded either belong to different ecological groups (zoophyton or zooplankton), or they are characterized by distinct feeding habits. *Erythromma najas* is one of the members of some of such communities and has been studied in detail. In the communities studied, the populations of this sp. had the 3rd or the 4th largest biomass of the association. In a community dwelling in submerged vegetation of a flood plain waterbody, the total metabolism of the population of this sp. amounted in Jul-Sept. to 1.53 ml O₂/m². hr, the abundance was 242 spec/m², the biomass 4.306 g/m², and the weight of 1 spec. (at the end of Nov.) 17.7 mg. In a *Ceratophylletum* community, in the mouth of a tributary, these values were 3.43 ml O₂/m².hr, 336 spec/m², 10.800 g/m² and 3.2 mg respectively.

1975

- (1586) AKRAMOWSKI, N.N., 1975. O tipah fauny i biogeograficheskom raionirovanii (na primere sovremennoi fauny mollyuskov i strekoz Armyanskoi SSR). [On the fauna types and biogeographical division (exemplified by the recent molluscan and dragonfly faunas of the Armenian SSR)]. In: Aktual'nye problemy zoogeografii. 6 vses. zoogeogr. Konf. Tez. Dokl., Shtiintsa, Kisinev, pp. 6-7. (Russian). — (*Inst. Zool., Armen. Acad. Sci., 7 Paruyr Sevak Str., USSR-375044 Yerevan*).

The purpose of the zoogeographical division of a territory lies in the determination of its faunal types. In his attempt to analyse the molluscan and odon. faunas of the Armenian SSR, USSR, the author applied the method introduced by B.K. Stegman (cf. B.P. Uvarov, 1937. *Nature*, Lond. 139: 492-494). This is an abstract of a paper presented at the Conference, hence it does not include any detailed evidence. — (*Abstracter's note: An Engl. translation of the text is available from the Editors of Odonatologica*).

- (1587) ANDRIÈS, J.C., 1975. L'intestin moyen: un nouveau modèle de réponse aux hor-

mones d'Insectes. Colloques internationaux C.N.R.S. 251 (Actualités sur les hormones d'Invertébrés), pp. 483-492. (With Engl. s.). — (*Lab. Biol. anim., Univ. Sci. & Techn., B.P. 36, F-59650 Villeneuve d'Ascq*).

During the metamorphosis of the larva of *A. cyanea* the regenerative cells of the midgut epithelium proliferate actively and form two tissues that differentiate at an interval of some days: the reticulate tissue and the imaginal epithelium. This system lends itself to the study of the mode of action of hormones and their analogs on cell multiplication and differentiation. Early injection of the analog F.M.E. inhibits midgut metamorphosis: there is neither multiplication nor imaginal differentiation of the regenerative cells. Multiplication is achieved by injection of varying doses of α - or β -ecdysone, but the number of cells in the regeneration centres remains below that in controls at the end of metamorphosis. Imaginal epithelium is only formed after injection of $5\mu\text{g}$ β -ecdysone after the onset of the last intermolt. α -ecdysone or lower doses of β -ecdysone are ineffective. In controls, imaginal epithelium is formed when hormone concentration reaches a peak.

- (1588) ANDRIÈS, J.-C., 1975. Différenciation et mort cellulaires au cours de la métamorphose mésentérique de la larve d'*Aeshna cyanea*. *J. Microsc. Biol. Cell.* 24 (2/3): 327-350. (With Engl. s.). — (*Lab. Biol. anim., Univ. Sci. & Techn., B.P. 36, F-59650 Villeneuve d'Ascq*).

Cellular differentiation and death during mesenteric metamorphosis were studied in the larval *A. cyanea*. During metamorphosis the midgut undergoes very important transformations: histogenesis of the imaginal epithelium, histolysis of the reticulate tissue (transient tissue which is constituted just before the imaginal epithelium) and of the larval epithelium. The most conspicuous occurrences in the process of differentiation, at the nuclear level, are transfer of material from nucleus to cytoplasm through nuclear pores and formation of large blebs enclosing chromatin which

detach from the nucleus. There are also multiplication of mitochondria, genesis of Golgi apparatus and development of rough endoplasmic reticulum. No important multiplication of the organelles occurs at any time during the differentiation of regenerating cells into the reticulate tissue which is marked by the genesis of wide vacuoles often associated with lipid droplets. Cellular death in the reticulate tissue and in the larval epithelium can also be observed at the nuclear and at the cytoplasmic level. Various phenomena accompanying cell death are described.

- (1589) ARAI, Y., 1975. [Abdomen bending in damselflies]. *Nature and Insects* 10 (14): 12-13. (Japanese). — (1-127 Motoishi, Kumagaya, Saitama, 360, JA).

The phenomenon is described in 5 spp., viz. *Cercion sieboldii*, *Enallagma deserti yezoensis*, *Copera annulata*, *Ceriagrion nipponicum* and *Indolestes peregrinum*.

- (1590) ARAI, Y., 1975. [Copulation and oviposition in *Lyriothemis pachygastra*]. *Nature and Insects* 10 (14): 13. (Japanese). — (1-127 Motoishi, Kumagaya, Saitama, 360, JA).

Sexual behaviour and territoriality are briefly described. Copulation takes 20-30 sec.; the ovipositing ♀ is guarded by the hovering ♂.

- (1591) BINNS, E.S., 1975. A reassessment of the numerical distribution of watermites (*Arrenurus* spp.) on dragonflies in relation to parasitism and dispersal. *Acarologia* 17 (3): 529-535. (With Fr. s.). — (*Glasshouse Crops Res. Inst., Littlehampton, Sussex, BN16 3PU, UK*).

Analysis of published data on the attachment of watermites, *A. reflexus* and *A. fissicornis*, to dragonflies, *Libellula luctuosa* and *Leucorrhinia intacta*, shows highly clumped distributions suggesting adaptation for dispersal rather than parasitism. Variations in the degree of clumping with increased mite loads suggest that searching is random, but that host recovery is greatest

when mite searching coincides with host emergence.

- (1592) EDA, S., 1975. [Transformation and life of dragonflies]. In: H. Hasegawa & K. Umeya, [Eds.], *The world of insects*, pp. 54-64. Seibundo Shinkosha, Tokyo. (Japanese). – (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
A popular account of the larval and adult life and behaviour of dragonflies is given (life history, emergence, territoriality, copulation, oviposition).
- (1593) MAZZUCCO, K., 1975. Beobachtungsstation Weisssee, 2300 m, Hohe Tauern, Salzburg. Arbeitsbericht 1974-1975. Ber. ArbGem. ökol. Ent. Graz, No. 6: 19-24. (With Engl. s.). – (Siezenheimerstr. 70, A-5020 Salzburg).
A brief report is given on the insect and bird migrations observed during 1974-1975 at the Observation Station, Weisssee (alt. 2300 m) in the Hohe Tauern, Austria. Migrating Odon. were recorded on Sept. 17, 1974 and on Sept. 18, 1975. The name(s) of the species involved are not stated. (For the alpine high altitude odon. records cf. references given in OA No. 1060).
- (1594) NORODA, M., 1975. [New dragonfly records from the Akita prefecture]. *Nature and Insects* 10 (14): 9. (Japanese). – (6-2 Torimachi, Noshiro, Akita, 016, JA).
At Kukizawa, Noshiro, Akita pref., Japan, 23 spp. were collected. *Coenagrion terue*, *Nehalennia speciosa* and *Aeshna mixta* are new to the fauna of the prefecture.
- (1595) OGINO, Y., 1975. [*Tramea virginia* in Hanno City]. *Nature and Insects* 10 (14): 9. (Japanese). – (284 Miyadera, Iruma, Saitama, 358, JA).
This is probably the first record of this sp. for the Saitama prefecture, Japan (Asu, Hanno; Sept. 2, 1973).
- (1596) POR, F.D., 1975. An outline of the zoogeography of the Levant. *Zool. Scr.* 4: 5-20. – (Dept. Zool., Hebrew Univ., Jerusalem, Israel).
- The marine, fresh-water and terrestrial distributional patterns in the region of the Eastern Mediterranean shorelands are discussed, and several historical formative events are singled out. Odon. are also considered.
- (1597) SHINKAI, A., 1975. [*Oligoaeschna pryer*]. *Gekkan Mushi* 1975 (57): 12-13. (Japanese). – (2-1-14 Taikan, Utsunomiya, Tochigi, 320, JA).
4 photographs of the ♂ in its territory.
- (1598) TENNESSEN, K.J., 1975. Reproductive behavior and isolation of two sympatric coenagrionid damselflies in Florida. Thesis, Univ. Florida, Gainesville. 89 pp. – (1949 Hickory Av., Florence, Alabama 35630, USA). – Microfilm or xerox copy available (refer to Order No. 76-12, 139) at University Microfilms, Dissertation Copies, P.O.B. 1764, Ann Arbor, Michigan 48106, USA (for USA) and at University Microfilms Ltd., Tylers Green, High Wycombe, Buckinghamshire, UK (for Europe and others). Verbatim abstract from Diss. Abstr. 36. June [1976]: 5961-B: The coenagrionid damselflies *Enallagma pollutum* (Hagen) and *E. signatum* (Hagen) are sympatric throughout most of Florida and may be called sibling species. Reproductive activity at water begins early in the afternoon in spring and fall, but the species are semi-crepuscular in summer. Males usually appear at water before females, and *E. pollutum* males usually before *E. signatum*. Behaviour and location of individuals prior to their appearance at water are unknown. Males interact vigorously in order to maintain a position at the water; prey capture at water is uncommon. Males and probably females are capable of sex recognition; the male's orange ninth abdominal segment is an important sex-recognition character. Pairing occurs only at water, without courtship displays. The male flies directly to the female and grasps her by the thorax with his legs. After clasping her with the abdominal appendages, the pair flies in tandem to a perch. In response to the female's "ab-

dominal probing", the male transfers sperm, followed by copulation which averages 20 minutes. Individuals may mate once in a day, but rarely mate on two successive days. Oviposition usually occurs in tandem shortly after copulation, at or below the water surface. *E. pollutum* and *E. signatum* are very effectively isolated. Flight seasons and daily mating times are concurrent. Partial isolation is gained by differences in microhabitat: *E. pollutum* males usually perch whereas *E. signatum* males usually hover over open water; *E. pollutum* females usually remain on or near vegetation, and although *E. signatum* females are also found there, they usually fly toward open water. These differences lessen the probability of interspecific meetings. However, many exceptions occur and males attempt tandem with females of either species; 25 per cent of the pairings observed were interspecific. Males are incapable of visually distinguishing females. Isolation occurs during tandem, as non-conspecific males release their grasp upon "refusal motions" by the female. Evidence indicates that tactile stimuli, provided by the shape of the male superior appendages, are releasers of mating behavior in females, and may isolate the species; this proposed mechanism is ethological. Males with altered appendage shape were unsuccessful in mating, and while the observations are not as controlled as desired, the results suggest a tandem period of species recognition. The female thoracic parts contacted by the appendages bear numerous trichoid and other sensillae. The function of specialized, secretory cells in the male superior appendages is unknown; chemical isolation is unreported in Odon., but the possibilities should be investigated. The author proposes that the nongenital mechanical isolation theory, in which the male abdominal appendages, because of structure, are supposedly unable to securely hold a heterospecific female, is untenable for Coenagrionidae. Clearly, ecological and ethological isolation is operative.

(1599) ULVINEN, A., 1975. Katsaus Kymen-

laakson sudenkorentoihin. [Dragonfly survey of Kymenlaakso]. Kymenlaakson Luonto 16 (3): 9-11. (Finnish). — (*Kulo-saaren puistotie 44 A 1, SF-00570 Helsinki-57, Finland*).

44 spp. known to occur in the Kymenlaakso Province, southeastern Finland, are listed. The list includes *Coenagrion puella*, which is known from a single Finnish locality. As far as the odon. fauna is concerned, the Kymenlaakso Province is the richest area of the country: the 44 spp. recorded representing 86% of the Finnish fauna (51 spp.).

(1600) VERVOORT, W., 1975. Rijksmuseum van Natuurlijke Historie te Leiden. Verslag van de Directeur over het jaar 1973. [State Museum of Natural History, Leyden. Annual report of the Director, 1973]. Ned. Rijksmus. 95: 276-371. (Dutch). — (*Rijksmus. Nat. Hist., Raamsteeg 2, Leiden, NL*). The Odon. Department is dealt with on pp. 337-339. Dr. P.H. van Doesburg Jr. functioned as a temporary Acting Curator, assisted by the technicians C. Scheffer and J. Sparreboom. Dr. D.C. Geijskes and Dr. M.A. Liefstinck were working regularly in the Department. New acquisitions include 500 specimens from Tanzania and some material from Mexico. A list of visitors is also given. The greatest problem of the Department is the fact that after the retirement of its former Curators, Dr. M.A. Liefstinck and Dr. D.C. Geijskes, it is not headed by an odon. specialist.

(1601) WESSING, A. & D. EICHELBERG, 1975. Ultrastructural aspects of transport and accumulation of substances in the Malpighian tubules. *Fortschr. Zool.* 23 (2/3): 148-172. — (*J. Zool. Inst. Justus-Liebig-Univ., Stephanstr. 24, D-63 Gießen, GFR*). Using the modern methods of EM in combination with physiological methods it is possible to study the transport potential of the cells of Malpighian tubules. Such studies on *Drosophila melanogaster* (Dipt., Drosophilidae), *D. hydei*, *Libellula pulchella* (Odon. Libellulidae) and *Calpodes*

ethlius (Lep., Hesperidae) reveal that: (a) different pathways exist for the passage of substances into the tubule from the haemolymph, and (b) the formation of intracellular and extracellular urine concretions is involved as well as the intracellular storage of substances.

- (1602) ZDUN, V.I. & S. PAVLYUK, 1975. Ob izmennyah v strukture fauny strekoz (Odonata) na zapade Ukrainy. [On changes in the structure of the dragonfly fauna (Odonata) of the western Ukraine]. In: Aktual'nye problemy zoogeografii. 6 vses. zoogeogr. Konf. Tez. Dokl., Shtiintsa, Kiyev, pp. 91-92. (Russian). — (*Dept. Invert. Zool., Lvov Univ., 4 Shcherbakov Str., USSR-290005 Lvov*).

While some "northern" spp. seem to disappear (*Leucorrhinia dubia*, *L. rubicunda*), or have become very scarce (*L. caudalis*, *Epithea bimaculata*) in western Ukraine, USSR, some spp. of "southern" provenience are becoming common (*Ischnura pumilio*, *Orthetrum albistylum*, *Sympetrum depressiusculum*). The latter sp. is new to the fauna. It is argued that the phenomenon is due to anthropogenous alkalization of the breeding sites.

1976

- (1603) ÅBRO, A., 1976. The mode of gregarine infection in Zygoptera (Odonata). *Zool. Scr.* 5 (6): 265-275. — (*Inst. Anat., Univ. Bergen, Arstadveien 19, N-5000 Bergen*).
The eugregarine *Hoplorhynchus oligacanthus* (Sieb.) is an intestinal parasite in imagines of the zygopterans *Pyrrhosoma nymphula* and *Enallagma cyathigerum*. Gametocysts, resulting from the union of a presumed male and a female gregarine gamont, leave the host with the faeces which drop to the woodland floor. Gametogony, zygote formation, and subsequent sporogony take place within the extrahost gametocysts. Infective sporozoites become enclosed in oocysts furnished with a highly resistant shell. When fully formed, the oocysts are released by simple rupture of

the gametocyst envelopes. The oocysts, which probably disperse in the habitat by means of rainwater, appear to enter a cryptobiotic state. Enzymic tests implied that liberation of sporozoites occurred more readily if oocysts were submitted to repeated freezing and thawing. Zygopterans consume lots of small insects; about three-quarters of zygopteran food was found to consist of Chironomidae and Ceratopogonidae. Examination of various small insects available as prey for zygopterans revealed imagines of medium-sized Chironomidae and Ceratopogonidae as vectors of *Hoplorhynchus* oocysts, which were found suspended on their tarsal bristles. An infective oocyst appears to contain 8 sporozoites. When introduced into a host, each of the sporozoites released from the oocyst will eventually develop into a gamont. Only one in a hundred chironomids and ceratopogonids was found to carry oocysts; none the less, this is considered sufficient to cause a high infection of the entire zygopteran populations. The occasional large number of non-infective oocysts without sporozoites indicates that sporogony and formation of an oocyst capsule are independent events. (Author).

- (1604) AITA, M., 1976. [Emergence of *Stylurus nagoyanus*]. *Nature and Insects* 11 (3): 26-27. (Japanese). — (*1-7-15 Sakae, Ichinomiya, Aichi, 491, JA*).
The observations were carried out from 1973 through 1975 at the Kiso River, Aichi pref., Japan. Emergence takes place between mid June and mid August, reaching a peak in early August. It occurs between 09.00 and 16.00 hrs, most frequently around 12.00. It should be classified as the "upright type".
- (1605) AMATEUR ENTOMOLOGISTS' SOCIETY, THE, 1976. Membership list. 37 pp. — (*c/o A.E.S. Hon. Advertising Secretary, 18 Golf Close, Stanmore, Middlesex HA7 2PP, UK*).
The odonatologist of the Advisory Panel of the Society is Mr. D. Keen (Corbiere, 3

Woodbourne, Farnham, Surrey, United Kingdom). The membership list contains approx. 40 addresses of amateur entomologists, marked as being interested in Odon. All of them are residents of the United Kingdom.

- (1606) ANDRIÈS, J.C., 1976. Présence de deux types cellulaires endocrines et d'un type exocrine au sein du mésenteron de la larve d'*Aeshna cyanea* Müller (Odonata: Aeshnidae). *Int. J. Insect Morphol. & Embryol.* 5 (6): 393-407. (With Engl. s.). — (*Lab. Biol. anim., Univ. Sci. Techn., B.P. 36, F-59650 Villeneuve d'Ascq*).

The midgut of insects generally consists of digestive and regenerative cells. However, in *A. cyanea*, 3 other well-defined types of cells are present. Two of these are endocrine cells since they discharge their contents into the internal medium at the level of the basement membrane. The first type is filled with dense granules, while the second contains vesicles, either with a core often eccentrically located or having a loose filamentous appearance. The accumulation of secretory material under the apical membrane suggests that the third type could be an exocrine cell. Since large numbers of microtubules were observed between the area of the formation of the granules and their pole of storage, we think that they are involved in the intracellular translocation of the secretory material. (Author).

- (1607) BENKE, A.C., 1976. Dragonfly production and prey turnover. *Ecology* 57 (5): 915-927. — (*Sch. Biol., Georgia Inst. Technol., Atlanta, Georgia 30332, USA*).

Annual production was calculated for 3 dominant larval odon. populations (*Ladona deplanata*, *Epitheca* spp., *Celithemis fasciata*) coexisting in the littoral zone of an abandoned farm pond. Dragonfly populations and their prey were collected simultaneously with an Ekman grab at 2-wk to 1-mo intervals. Production for each sp. was calculated using both the Allen curve method and the removal-summation method. Annual production for the 3 dom-

inant spp. was $\approx 6 \text{ g/m}^2$ (dry wt), and total odon. production was estimated as 8 g/m^2 . Weekly odon. production was consistently $> 0.3 \text{ g/m}^2$ from July through Sept. With a mean annual standing stock of $\approx 2 \text{ g/m}^2$, the odon. annual turnover ratio (TR) is ≈ 4 . Weekly TRs were highest during summer months, generally declining as individual size increased. From back calculations of the amount of food required to feed the Odon., it was estimated that a minimal value of annual prey production was 18 g/m^2 and a minimal estimate of weekly prey production in the summer months was almost 1 g/m^2 . With an observed prey standing stock of 0.6 g/m^2 , this would necessitate an annual prey TR of 30 and a weekly summer TR > 1 . Since such an indirect method of calculating prey production does not account for other sources of prey mortality such as fish predation and emergence, the TRs are considered to be minimum values, perhaps only half of actual values. These relatively high TR values agree quite well with estimates based upon the amount of food required to sustain fish predators. The significance of these estimates made using indirect methods is that they are considerably higher than estimates made using more traditional direct methods. An attempt is made to resolve this discrepancy by examining sources or error associated with both approaches. Furthermore, since Odon. have a standing stock frequently 2-3 times that of their prey and a large daily consumption capacity, it is suggested that prey are saved from annihilation because they can find sufficient refuges. (Author).

- (1608) BRODSKY, K.A., 1976. Gornyy potok Tyan'-Shanya. *Ekologofaunisticheskaya ocherk*. [The Tien Shan mountain torrent. An eco-faunistic study]. Nauka, Leningrad. 244 pp. (Russian). — Price: Rub. 2.30. — (*Inst. Zool., USSR Acad. Sci., Leningrad, USSR*).

This is an outstanding monograph on the lithophilous fauna and ecology of the Tien Shan alpine torrents, USSR, based prim-

arily on the study of 2 streams in Alatau and the Alay range respectively. Special attention is being paid to a comparison of the conditions prevailing in Tien Shan on one hand and in the Pamirs on the other. Odon. are but seldom met with under the extreme conditions of the biotopes considered, hence there are but few references to the order. Ephemeroptera, Plecoptera, Diptera and Trichoptera are, of course, dealt with in extenso.

- (1609) BRUENKO, V.P., 1976. Pitanie shchuki (*Esox lucius* L.) Kremenchugskogo vodohranilischcha v period neresta. [The feeding of pike (*Esox lucius* L.) of the Kremenchug Reservoir during spawning]. *Gidrobiol. Zh.*, Kiev 12 (1): 121-125, 135 (Russian). — (*Inst. Hydrobiol., Ukrain. SSR Acad. Sci.*, 44 *Vladimirskaia Str.*, *USSR-252003 Kiev*).

In the reservoir (Ukrainian SSR, USSR) larval Odon. were discovered in 0.9% of pike stomachs examined in the post-spawning period. They did not occur there during other seasons.

- (1610) CAMPBELL, B.C. & R.F. DENNO, 1976. The effect of temephos and chlorpyrifos on the aquatic insect community of a New Jersey salt marsh. *Environ. Entomol.* 5 (3): 477-483. — (*Dept. Ent., Univ. California, Davis, Calif. 95616, USA*).

The effects of 4 biweekly applications of recommended dosages of the mosquito larvicides temephos and chlorpyrifos on the community structure and seasonal succession of aquatic insects inhabiting salt marsh potholes were examined. Using an open-ended cylinder, benthic, neustonic and nec-tonic organisms were sampled at weekly intervals in treated and untreated potholes from May 29 through Aug. 15, 1974. Twenty species of aquatic insects (Libellulidae, Corixidae, Hydrophilidae, Culicidae, Ceratopogonidae, Chironomidae, Stratiomyidae, Tabanidae, Dolichopodidae and Ephydriidae) were recovered, including both larval and adult life stages. One corixid, *Trichocorixa verticalis* (Fieber) dominated

the pothole community. Effects of the larvicides on insect community structure were tested by monitoring species richness, species diversity, and densities of dominant, subdominant and predatory insects before and after pesticide applications. The results of this study confirmed that temephos and chlorpyrifos were selective mosquito larvicides, controlling bloodsucking Nematocera without significantly changing the species richness and diversity of the nontarget salt marsh aquatic insect community or altering the densities of the dominant insects.

- (1611) CHARLET, M. & F. SCHALLER, 1976. Blocage de l'exuviation chez la larve d'*Aeshna cyanea* (Insecte Odonate) après électrocoagulation d'un centre neurosécréteur du protocérébron antérieur. *C.R. Acad. Sc. Paris (D)* 283 (13): 1539-1541. — (*Lab. Biol. gén., Univ. L. Pasteur, 12 rue de l'Université, F-67000 Strasbourg*).

Total or one-sided electrocoagulation of the paramedian anterior neurosecretory A cells was performed in larvae of *A. cyanea* in order to investigate the function of these cells. It was found that ecdysis did not take place in larvae operated on both sides at the end of the intermoult. It was concluded that the p.a.n.A cells probably have a function in initiating ecdysis. This is in agreement with observations of other authors on certain Lepidoptera, where a neurotropic ecdysis hormone is responsible for characteristic pre-ecdysis behaviour.

- (1612) COOKE, J.A.L., 1976. Borne on the wind: the extraordinary world of insects in flight. By Stephan Dalton. *Ent. mon. Mag.* 111 (1334-1336) [1975]: 175-176. — (*Oxford Scientific Films, Oxford, UK*).

A book review of the volume listed in *OA* No. 1438.

- (1613) CORDULIA. *Cahier d'amateurs*. Published by the Collège Bourget, Rigaud, Quebec, Canada; edited by R. Hutchinson & A. Laroche, Collège Bourget. Vol. 2, No. 4 (Dec. 1976). (French and Engl., all larger papers with S's in both languages). —

- Annual subscription for 1976 (4 issues): Can. \$ 2.- (Canada, USA), Can. \$ 3.- (others). — (c/o R. Hutchinson, Collège Bourget, C.P. 1000, Rigaud, JOP IPO, Que., CA).
- Hutchinson, R.: Catalogue des Odonates du Québec (Deuxième partie: Anisoptères) (Suite); — Rousseau, Y. (6 Morin, Lévis, Que., CA): Une quatrième station de *Nehalennia gracilis* Morse (Odonata: Zygoptera) pour le Québec; — Hutchinson, R.: Un *Epi-theca princeps* Hagen femelle dans un état comateux sous une feuille; — Hutchinson, R.: Les protozoaires dans l'alimentation des jeunes larves de libellules; — Hutchinson, R.: Notes sur la distribution de *Libellula luctuosa* Burmeister au Québec; — Larochelle, A.: (Collège Bourget, C.P. 1000, Rigaud, Que., CA): Odonata as prey and predators of tiger beetles; — Hutchinson, R.: Observations de la ponte de *Nehalennia irene* Hagen (Zygoptera: Coenagrionidae) à Melbourne Valley, Cantons de l'Est, Québec; — Hutchinson, R.: Nouvelle récolte de *Cordulegaster obliquus* Say à Rigaud; — Hutchinson, R.: Autres cas de Libellules qui touchent l'eau (première note); — *Publications sur les Odonates* (containing brief French abstracts of 7 papers). — In the issue is inserted a 4 page list of addresses of approx. 250 subscribers (Canada 150, USA 50, Europe 50).
- (1614) DUNKLE, S.W., 1976. Larva of the dragonfly *Ophiogomphus arizonicus* (Odonata: Gomphidae). *Fla Ent.* 59 (3): 317-320. — (250 W. Bullard, Apt. 204, Clovis, California 93612, USA).
The larva of *O. arizonicus* Kennedy is described and figured from New Mexico. It is extremely similar to the larvae of *O. severus* Hagen and *O. morrisoni* Selys. The dorsal hooks on segments 2-9 of the abdomen are higher than those of *O. severus* but shorter and more robust than those of *O. morrisoni*. The ante-apical tubercles of male *O. arizonicus* larvae are positioned at mid length on the epiproct. The placement of these tubercles is similar in *O. severus* but 2/3 out from the base of the epiproct in *O. morrisoni*. Notes on the habitat and emergence of adult *O. arizonicus* are given. (Author).
- (1615) EDA, S., 1976. [Review of odonatology in Japan in 1975]. *Nature and Insects* 11 (2): 2-4. (Japanese). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
Chronicle of the Japanese odonatological achievements and events in 1975. Special reference is made to the revisional work on the genus *Mnais* by Dr. S. Asahina (cf. *OA* No. 1242), and a brief book review is given of the volume listed in *OA* No. 1638. — (For references to the chronicals 1971-1974 cf. *OA* No. 1249).
- (1616) EDA, S., 1976. [Dragonflies]. In: S. Asahina, [Ed.], *Obunsha illustrations, Insects*, pp. 92-106. Obunsha, Tokyo. (Japanese). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
Colour illustrations are given of 103 Japanese spp., along with distributional maps and brief characterizations of the higher taxa.
- (1617) EDA, S., 1976. [The world of dragonflies]. In: T. Hidaka, [Ed.], *Illustration series for nature observation*, Vol 3, pp. 42-85, 132-135. Gakushu Kenkyusha, Tokyo. (Japanese). — (3-4-25 Sawamura, Matsumoto, Nagano, 390, JA).
This is a series of 104 colour illustrations, most of which are devoted to the life history, behaviour and biology of *Anax parthenope julius*. — (Abstracter's note: An English version is in preparation).
- (1618) ESSEN, F.W. van & W.A. DARRELL, 1976. Susceptibility of nontarget organisms to *Nosema algerae* (Microsporida: Nosematidae), a parasite of mosquitoes. *J. Invertebr. Pathol.* 28 (1): 77-85. — (1252 Sunrise Dr., Pittsburgh, Pa. 15241, USA).
Laboratory studies were conducted to determine the susceptibility of 9 mosquito predators to the microsporidian pathogen of anopheline mosquitoes, *N. algerae*. The predators tested were *Anax junius* (Odon.):

Hydrophilus sp., *Coptotomus interrogatus* (Coleoptera), *Notonecta undulata*, *Belostoma flumineum*, *Ranatra australis* (Hemiptera), *Chauliodes rastricornis* (Megaloptera), *Procambarus* sp. (Decapoda), and *Gambusia affinis* (Pisces). Of these species only *N. undulata* was susceptible to *N. algerae* after having fed diseased larvae. Infection rates in 4 tests averaged 47.9%. The tissues infected in adult notonectids were gut, muscle, fat body, Malpighian tubules, tracheal epithelium, testes, brain, hypodermis and ommatidia.

- (1619) FINLAYSON, L.H., 1976. Abdominal and thoracic receptors in insects, centipeds and crustaceans. In: P.J. Mill, [Ed.], *Structure and function of proprioceptors in the invertebrates*, pp. 153-211. Chapman & Hall, London. — (*Dept. Zool. & Comp. Physiol., Univ. Birmingham, Birmingham B15 2TT, UK*).

This is an account of the stretch receptors, muscle receptor organs and chordotonal organs in the above arthropods. They are described in terms of their anatomical arrangement, structure and physiology. Details are given of the process of stimulus transduction in insects and of the functions of stretch receptors in the control of posture and locomotion. The abdominal stretch receptors and chordotonal organs of the *Aeshna* larva are also discussed.

- (1620) FLINT, O.S., Jr., A.S. MENKE, F.C. THOMPSON & R.A. WARD, [Eds.], 1976. The United States national entomological collections. Smithsonian Inst. Press, Washington, D.C., 48 pp. — (*Am. Mus. Nat. Hist., Central Park West at 79th Str., New York, N.Y. 10024, USA*).

The booklet presents a review of the entomological collections of the (United States) National Museum of Natural History, and has been published on the occasion of the XVth Int. Congr. Entomol. A brief outline of the history is followed by the accounts of collections of different orders. Brief curriculum data of the curators, some photographic material and bib-

liography of publications on the Entomology collections of the Museum are appended. The following is the verbatim text of the odon. section (pp. 10-11): [It is] large and generally well curated although not very rich in type material. The collection received its first major impetus from the efforts of Rolla P. Currie, who was employed at the Museum from 1894 to 1904 and was ably assisted by his sister, Bertha P. Currie. At that time very extensive collections were made locally. Other important early additions were those from the Mississippi Valley Pearl Mussel Investigations reported on by C.B. Wilson, the early western U.S. studies of C.H. Kennedy, and duplicates deposited by E.B. Williamson and others. The Baker Collection from the Philippines and the Graham collections from southwestern China were the basic materials for the Needham studies on the Odonata of the Philippines and China. More recently, important synoptic collections have been received from M.A. Lieftinck, E.C.G. Pinhey, and others. In addition large collections from the Neotropical and other regions made by the staff of the Museum have been identified by J. Belle, T.W. Donnelly, D.R. Paulson and M.J. Westfall, Jr., among others. Recently, 2 very large and valuable collections especially rich in North American material were accessioned, one jointly from B.F. Montgomery and Purdue University, and the other from R.H. Gibbs, Jr. The older portions of the collection, especially those from the United States, are mostly pinned and spread. However, the recent collections and many old ones that were in paper triangles have been transferred to transparent plastic envelopes, placed in special cardboard storage boxes, and stored in slightly modified, metal herbarium cabinets. The coverage of the Nearctic region is now nearly complete, and that of the Palearctic region almost as good. The generic coverage in the other regions of the world is very good, although many species are lacking. Recent collections by members of the staff at the Museum in the Neotropical region have tremendously expanded

coverage and produced large series of many species. The collection of the immature stages is, however, very incomplete. This collection is contained in 325 museum drawers and 575 storage boxes (containing approximately 100 specimens each). 80 types are present.

- (1621) GAEDIKE, R., 1976. Bibliographie der Bestimmungstabellen europäischer Insekten (1964-1973). Beitr. Ent. 26 (1): 49-166. (With German and Russian s's) - (*Abt. Taxonomie d. Insekten, Inst. Pflanzenschutzforschung, Schocklerstr. 5, DDR-13 Eberswalde-Finow-1, GDR*).

This is a continuation of the Göllner-Scheidung series, covering the 1880-1963 bibliography, and which has appeared in Beitr. Ent. 17: 697-958 (1967), Mitt. Zool. Mus. Dresden 45: 3-156 (1969), and Dt. ent. Z., N.F. 17: 33-118, 433-476 (1970). The present bibliography (1570 titles) is based on the literature available in the Department of Insect Taxonomy, Eberswalde-Finow, German Democratic Republic. As far as the Odon. are concerned, it is very incomplete, listing 6 publications only.

- (1622) GARRISON, R.W., 1976. Multivariate analysis of geographic variation in *Libellula luctuosa* Burmeister (Odonata: Libellulidae). Pan-Pacif. Ent. (3): 181-203. - (*Div. Ent., Agric. Exp. Stn, Coll. Agric. Sci., Univ. California, 201 Wellman Hall, Berkeley, California 94720, USA*).

The author subjectively recognized 3 distinct morphs of *L. luctuosa*, with phenotypic intermediates occurring in the central United States. A definite phenetic gap was observed only between the highly pruinose desert populations and the less pruinose *luctuosa-odiosa* phenotypes. The lack of intermediate forms may be due in part to inadequate collecting, but is mostly a result of the absence of specimens from the Tehachapi Mountains of California and from the eastern edge of the Sonoran Desert in Arizona. Results of the various analyses show a high degree of concordance in the classification of intraspecific forms.

The a priori distinctions between *odiosa* and *luctuosa* are not salient and the names do not warrant separate taxonomic rank.

- (1623) HALKKA, L. & O. HALKKA, 1976. The fate of a gene product body in the oocytes of *Cordulia aenea* L. (Odonata). [Abstr. Papers] 8th Meeting Scand. Assoc. Genet., Turku, p. 31. - (*Dept. Genet., Univ. Helsinki, P. Rautatiekatu 13, SF-00100 Helsinki-10, Finland*).

[Verbatim text]: 2 different aggregates of gene products, organized by separate chromosomes, are found in the panoistic oocytes of *Cordulia* in pachydiplotene: the nucleolus and a smaller gene product body (GPB). The GPB, which also has been called "endobody" or "secondary nucleolus", differs from the nucleolus in ultrastructure and chemical composition, containing much less RNA and much more basic proteins (histones?). During the third year of larval development the oocytes reach the middle of the RNA accumulation stage or previtellogenesis, and the GPB develops to a sphere about 4 μ in diameter. It is composed of loose fibrous material and shows no specific structural changes during different seasons of the year. In the winter preceding emergence into adult, *Cordulia* passes through an obligatory diapause. This gears the oocyte to go further into the stages of late previtellogenesis and vitellogenesis proper. The process is accompanied by a drastic change in the structure of the GPB. The body becomes fuzzy and diminishes in size, until only a small core composed of fibrils with small attached granules remains in the nucleus. The GPB always shows a central position in the oocyte nucleus and does not form perichromatin granules (as do the mRNA producing loops). This leads us to suggest that it may have regulatory functions on the nuclear genes (or cytoplasmic processes) at the phase of transition in oocyte development from mid to late previtellogenesis.

- (1624) HIROSE, M., 1976. [Dragonflies of the Ibaraki prefecture. First report]. Gekkan

Mushi 1976 (67): 9-14. (Japanese). — (3-4-7 *Daikucho, Mito, Ibaraki, 310, JA*).

A survey is given of the odon. fauna of the Ibaraki prefecture, Japan. Among the hitherto recorded 88 spp., the following are rare or new to the fauna of the prefecture: *Coenagrion terue*, *Ceriagrion nipponicum*, *Cercion sexlineatum*, *Epiophlebia superstes*, *Davidius m. moiwanus*, *Aeshna juncea*, *A. mixta*, *A. nigroflava*, *Macromia daimoji*, and *Tramea virginea*.

Zool. 54 (12): 2033-2045. (With Fr. s.). — (*Dept. Zool., Clemson Univ., Clemson, SC 29631, USA*).

Larvae of *Enallagma hageni* and *E. aspersum* were collected in North Carolina, USA, from Aug. to March and subjected to 11- and 14-h photoperiods at 16 and 21°C. Development was generally completed more rapidly under long-day conditions. Under all daylength and temperature regimes, development time from the middle instars to emergence decreased from a maximum for those collected in Aug. to a minimum for those collected in March. The 2 spp. had similar developmental times under long photoperiods at 21°C; short photoperiods, however, were more inhibitory to the growth of *E. hageni* than to *E. aspersum*. The photoperiodic responses of *E. hageni* were similar at both temperatures, the developmental times being only slightly slower at 16°C. In contrast, *E. aspersum* kept at 16°C showed no photoperiodic response. In both spp., diapause of prolonged development occurred primarily in the two instars before the final, but not in the final itself. Extra molts usually accompanied slow developmental times in both spp., regardless of photoperiod. The incidence of extra molting was greatest under conditions combining high temperature and short daylength. Extra molts were apparently common in field populations of *E. aspersum*, but were rare in those of *E. hageni*. (Authors).

- (1625) INGRAM, B.R., 1976. Effects of photoperiod and temperature on abnormal wing-pad development of two species of Odonata. *Can. J. Zool.* 54 (7): 1103-1110. (With Fr. s.). — (*Dept. Zool., Clemson Univ., Clemson, SC 29631, USA*).
- Larvae of *Enallagma hageni* and *E. aspersum* were collected in North Carolina, USA, from Aug. or Sept. to March and subjected to long- and short-day photoperiods at 16 and 21°C. Abnormal wing pads frequently developed in the later instars of both sp. under daylength-temperature combinations that induced extra molts and slow growth from the middle instars to emergence. Abnormal wing pads were formed only at the higher temperature, primarily under short-day conditions, where extra molts were generally more numerous and growth was usually slower than under long days. Abnormal wing pads occurred under long days at 21°C only in the early experiments, when extra molts were common; growth was also slow under these conditions. Mortality was considerably higher in larvae with abnormal wing pads than in those undergoing normal development. The absence of abnormal wing pads at 16°C compared with 21°C suggests that even small temperature alterations, such as those resulting from discharges of heated water, may have adverse effects on the development of some aquatic insects. (Author).

- (1627) KAISER, R., 1976. Impact de la pollution sur les biocénoses benthiques d'une rivière canalisée de Belgique. *Bull. fr. Piscicult.* 48/1 (260): 110-120. — (*Dép. Ecol., Biogéogr. & Syst. anim., Fac. Univ. N.-D. de la Paix, rue de Bruxelles 61, B-5000 Namur*). This is a French and slightly more detailed version of the paper listed in OA No. 1636. The 3 odon spp. are given as *Calopteryx* sp. (*Agriion*), *Coenagrion* sp. and *Platycnemis pennipes*.

- (1626) INGRAM, B.R. & C.E. JENNER, 1976. Influence of photoperiod and temperature on developmental time and number of molts in nymphs of two species of Odonata. *Can. J.*

- (1628) KEEN, D.H.R., 1976. Golden-ringed dragonfly in Farnham. *Bull. amat. ent. Soc.*

36 (313): 160. – (*Corbiere, 3 Woodbourne, Farnham, Surrey, UK*).

An exuvia of *Cordulegaster boltoni* taken on June 10, 1976 near Farnham, Surrey, United Kingdom, is brought on record.

- (1629) KEEN, D.H.R., 1976. Butterflies on mud. Bull. amat. ent. Soc. 36 (313): 160-161. – (*Corbiere, 3 Woodbourne, Farnham, Surrey, UK*).

Libellula depressa and *Orthetrum cancellatum* are recorded from Odiham Common, Hampshire, United Kingdom (June 29, 1976).

- (1630) KEEN, D.H.R., 1976. Preserving the colours of dragonflies. Bull. amat. ent. Soc. 36 (313): 161. – (*Corbiere, 3 Woodbourne, Farnham, Surrey, UK*).

The specimen should be killed by immersion in methylated spirits. After the gut has been removed (in Anisoptera only) it is set upside down on a piece of balsa wood or stiff cork. This is then floated, the dragonfly underneath, in a "bath" of methylated spirits. After 2-3 days the specimen is removed and allowed to dry before being placed in the storebox. In this way the pattern and most of the colour is retained, incl. the colouring of the eyes. – (For another method cf. *OA* No. 1486).

- (1631) KLINGMAN, A., 1976. Electrophysiological analysis of synaptic transmission in the retina of the dragonfly ocellus. Thesis, City Univ. New York. 132 pp. – (*Author's address unknown*). – Microfilm or xerox copy available (refer to Order No. 76-13, 540) at University Microfilms, Dissertation Copies, P.O.B. 1764, Ann Arbor, Michigan 48106, USA (for USA) and at University Microfilms Ltd., Tylers Green, High Wycombe, Buckinghamshire, UK (for Europe and others).

(Verbatim abstract from Diss. Abstr. 36, June [1976]: 5916-B): The response of the ocellar nerve dendrite, the second order neuron in the retina of the dragonfly ocellus, has been analyzed by means of intracellular recording and a model constructed

to explain the generation of that response. Responses were recorded from ocellar nerve dendrites in 5 different species. The typical light response, similar in all species, consisted of a hyperpolarization with a large transient and a smaller sustained component, followed by an overshoot of the resting potential and oscillations after light-off. The hyperpolarization was accompanied by a resistance decrease. The transient nature of the ocellar nerve dendrite response compared with the receptor response, and anatomical evidence of synapses from the ocellar nerve dendrites back to the receptor terminals, led to the hypothesis that the ocellar nerve dendrite response reflected an interaction between synaptic input from the receptors and synaptic feedback from the ocellar nerve dendrites to the receptor terminals. A method was devised for perfusing the ocellar nerve dendrite preparation with various solutions during intracellular recording, and it was found that the response could be modified by drugs. Curare blocked the response completely, while acetylcholine hyperpolarized the ocellar nerve dendrite. Both picrotoxin and bicuculline eliminated the "off" overshoot, and bicuculline also decreased the size of the response and the sensitivity. GABA increased the size of the response. The evidence suggests that the receptor transmitter may be acetylcholine and that the ocellar nerve dendrite feedback transmitter may be GABA. A model was developed to explain the typical ocellar nerve dendrite response and the effect of drugs on that response. According to the model, both receptor and feedback transmitters are released in the dark. Light increased the amount of receptor transmitter released. The receptor transmitter hyperpolarizes and inhibits the ocellar nerve dendrite and its feedback transmitter release. The feedback transmitter has a facilitatory effect on the release of transmitter from receptor terminals.

- (1632) LAHIRI, A.R. & T.R. MITRA, 1976. Notes on some damselflies of Calcutta (Odonata: Zygoptera). Ent. News 87 (9/10): 295-298

— (*Eastern Reg. Str. Zool. Surv. India, Risa Colony, 793003-Shillong, Meghalaya, India*).

8 coenagrionid spp., collected in Calcutta, India, from Sept. 1966 through Nov. 1970, are reported. 4 of these are new records for eastern India, 2 are new for Bengal (the state of West Bengal, India and Bangladesh).

- (1633) LAUGHLIN, S.B., 1976. Neural integration in the first optic neuropile of dragonflies. IV. Interneuron spectral sensitivity and contrast coding. *J. comp. Physiol.* 112 (2): 199-211. — (*Dept. Neurobiol., Res. Sch. Biol. Sci., Austral. Natn. Univ., P.O.B. 475, Canberra City, A.C.T. 2601, AU*).

(1) Intracellular recordings are made from second order interneurons in the visual system of the dragonfly, *Hemicordulia tau*. The dark-adapted spectral sensitivity functions of these large monopolar cells (LMC's) are measured by obtaining intensity/response functions at 12 wavelengths between 317 and 614 nm; — (2) The LMC response waveform depends only upon intensity and not upon wavelength (Fig. 1) and at all wavelengths except 614 nm the slopes of the $V/\log I$ curves are not significantly different (Fig. 2 and Table 1). It is concluded that dark-adapted LMC's are not spectrally opponent and the dark-adapted pathway shows no wavelength dependent inhibition; — (3) The average spectral sensitivity function of LMC's is extremely broad (Fig. 5) and sensitivity is greater than 40% between 317 and 614 nm. Maximum sensitivity is at 475 nm and at this wavelength 1.2×10^9 quanta/cm²/s are required to give a response of 50% maximum amplitude; — (4) LMC's have no polarisation sensitivity in the green and low PS in the UV. This together with the shape of the spectral sensitivity curve and the lack of response noise in the UV, suggests that the "linked pigment" retinula cells with broad spectral sensitivity functions form the major receptor input to LMC's; — (5) The LMC's lack of colour sensitivity is considered along with their absolute sensitivity, dynamic

range of response, angular sensitivity and light adaption properties. It is concluded that the LMC's function to provide the visual system with a high sensitivity, low noise contrast input that is well suited for high acuity movement perception. (Author). — (For Pts. I-III cf. *OA* Nos. 636, 975-976).

- (1634) LÖDL, M., 1976. Die Libellenfauna Österreichs. 1. Nachtrag. *Linzer biol. Beitr.* 8 (2): 383-387. — (*Bierwolfsgasse 52, A-2103 Langenzerdorf*).

The paper presents supplementary notes and corrections concerning the publication listed in *OA* No. 1409. The status of the Austrian odon. fauna is given as 79 known spp. — (*Abstracter's note*: For a different estimation of the status of the Austrian odon. fauna cf. *OA* No. 1561).

- (1635) MARCUZZI, G. & L. DALLE MOLLE, 1976. Contributo alla conoscenza del popolamento animale di una torbiera piana del Veneto (Lipoi, Feltre). *Studi trent. Sc. nat.*, (N.S.) 53 (6 B): 123-169. — (*Ist. Biol. anim., Univ. Padova, Via Loredan 10, I-35100 Padova*).

Ischnura elegans, *Aeshna cyanea* and *Somatochlora flavomaculata* are the only odon. spp. identified from the pools of the Lipoi marshes (alt. 310 m, surface 6.5 ha) nr. Feltre, Veneto, Italy.

- (1636) MICHA, J.-C., R. KAISER & E. de MOFFARTS, 1976. Pollution and the production of invertebrates and fish in a canalized river. *FAO, Europ. Inland Fisheries Advisory Commission, Symposium on Biological Monitoring, EIFAC/76/SM-11, 5 pp.* With Fr. s.). — (*Dép. Ecol., Biogéogr. & Syst. anim., Fac. Univ. N.-D. de la Paix, rue de Bruxelles 61, B-5000 Namur*).

From the physical and chemical water quality characteristics, the Belgian Sambre shows 3 distinct sections: the relatively unpolluted upper part, the heavily polluted middle region, and a recuperating lower zone. The nature of the aquatic biocenoses is directly related to the quality of water.

Thus, the upper Sambre is colonized by a diverse fauna, the middle zone abruptly becomes abiotic, while in the lower part some fauna elements are reappearing. 3 odon. spp. were recorded in the upper region only. (Cf. also *OA* No. 1627).

- (1637) MIHELČIČ, P., 1976. Merkujev "Kačji pastir". [Merku's "Dragonfly"]. *Delo*, Ljubljana 18 (274): 8 (issue of November 23, 1976). (Slovene). — (c/o "Delo", Tomšičeva ul. 1-3, YU-61000 Ljubljana).

This is a daily's review of the first performance of the opera "Dragonfly", on Nov. 19, 1976 in the "Giuseppe Verdi" theatre, Trieste, Italy. The composer is P. Merku, a Slovene of Trieste origin. The libretto, by S. Makarovič, has been published in Italian ("La libellula") and in Slovene ("Kačji pastir") by Sonzogno Musical Publishers, Milan, Italy. The title part, "Dragonfly", of the 2-acts' opera is performed by a woman ballet-dancer, symbolising "poetry". The 2 protagonist singers' roles are a soprano and a baritone. The tendency and the poetical significance of the story lie in the successive uncovering of the stratified human conscious and subconscious. — (*Abstracter's note*: The original libretto has not been available to the abstracter. This is one of the very few musical works in which the dragonfly plays the main symbolic role. For a reference to this subject cf. also *OA* No. 1564).

- (1638) MIYAKAWA, K., 1976. [The life of the dragonfly — from larva to adult]. 84 pp., Komine-Shoten, Tokyo. (Japanese). — (1024 *Imafuku*, *Kawagoe-shi*, *Saitama-ken*, 356, JA).

This is the 3rd edition (first published in 1974) of a popular book, written for elementary school children and young dragonfly admirers. It narrates the principal features of dragonfly life, and gives a brief account of the common spp. of the Japanese lowlands. It is organized into 8 chapters, viz. "Introduction", "Morphology and taxonomy", "From egg to hatching", "Larval life", "Larval development",

"Metamorphosis and emergence", "Adult life", "Man and dragonflies". A review of some spp. is appended in a tabular form. The book is nicely illustrated by photographs and drawings. On the cover a portrait and brief biographic data of the author are also given (Born in Tokyo, 1935; graduated at Tokyo Kyoiku Univ.; at present Peers' School teacher). — (*Abstracter's notes*: (1) For a brief book review cf. *OA* No. 1615; (2) For another Japanese children's dragonfly book cf. *OA* No. 110).

- (1639) NARUMI, K., 1976. [The dragonfly fauna of the Amami Islands]. *Nature and Insects* 11 (9): 10-14. (Japanese). — (4400-23 *Nishibepucho*, *Kagoshima*, 890, JA).

During 1973-1975, 42 spp. were collected on the Amami Islands, Japan, including *Coeliccia ryukyuensis amarii*, *Gomphus a. amamiensis*, *Gynacantha ryukyuensis*, *Hemicordulia mindana*, *Orthetrum glaucum*, *Diplacodes trivialis*, and *Zyxomma petiolatum*.

- (1640) NELEMANS, M., 1976. Aktiviteitsritmiek bij libellen in Noord-Zweden (64°NB). Daily activity of dragonflies in northern Sweden (64°N). Stencil, 19 pp. Lab. Zool., Univ. Groningen, Haren. (Dutch, with Engl. s., title not translated). — (*Guyotplein 5A*, *Groningen*, NL).

This is a preliminary report on observations carried out in the surroundings of Umea, Sweden, July 3-12, 1976. It deals mostly with *Libellula quadrimaculata*. In spite of sunshine, lasting nearly 24 hrs, the dragonflies do stick to a day rhythm. As for *L. quadrimaculata*, activity begins at about 06.30 hrs, reaches a peak between 10.00-12.00 hrs, and ceases at about 16.00 hrs. The sun radiation has an essential influence, but other abiotic factors considered (amount of light, temperature, wind) have not.

- (1641) PETERLIN, S. [Ed.], 1976. Inventar najpomembnejše naravne dediščine Slovenije. [Inventory of the most important nature territories and objects of Slovenia]. Zavod

SR Slovenije za spomeniško varstvo, Ljubljana. 860 pp., 1 col. map excl. (Slovene). — (*Inst. Conserv. Monuments, P.O.B. 176, YU-61001 Ljubljana*).

367 nature reserves, nature territories and other objects of importance from the nature conservation point of view in Slovenia, Yugoslavia, are catalogued. Among these the Fiesa Lake nr. Piran (Istria), and the Marshes of Jelovica (= Jelovska barja) are listed as being of particular odonatological importance. The former is a well-known site of *Lindenia tetraphylla* and *Somatochlora meridionalis*. (Cf. also B. Kiauta, 1969. Nature Conservation, Ljubljana 6: 121-130).

- (1642) PILON, J.-G. & M.-A. LEBUIS, 1976. Peuplement odonatologique (Insecta: Odonata) de différents milieux aquatiques de la région de Saint-Hippolyte, Cté Prévost, Québec, Canada. *Ann. Soc. ent. Québec* 21 (3): 126-135. (With Engl. s.). — (*Dép. Sci. biol., Univ. Montréal, C.P. 6128 Montréal-101, Québec, CA*).

The odon. fauna of 6 aquatic habitats is analysed. 6 spp. are characteristic of eutrophic environment, 4 of a dystrophic lake, 1 of a dystrophic marsh and 7 of small streams. The work has been carried out from 1969 through 1970, in the Saint-Hippolyte region, Prévost, Quebec, Canada.

- (1643) PINHEY, E., 1976. Dragonflies (Odonata) of Botswana, with ecological notes. *Occ. Pap. natn. Mus. Rhod. (B)* 5 (10): 524-601. — (*Natl Mus., P.O.B. 240, Bulawayo, Rhodesia*).

A survey is given of 113 spp. known to occur in the territory of Botswana, Southern Africa. 3 of these are new, viz. *Phyllogomphus brunneus* sp.n. (♂ holotype, ♂ paratype, ♀ allotype: Four Rivers, 7-12-1973; other material from Zambia), *Macromia paludosa* sp.n. (* holotypes: Shakawe, W. Okavango River, 26-3-1974; 2 teneral ♂: Maramba River nr. Livingstone, Zambia), *Diplacodes okavangoensis* sp.n. (♂ holotype, ♀ allotype: Four Rivers, 11/12-12-1973; numerous paratypes from various

localities). Figures are provided. Holotypes in National Museum, Bulawayo, Rhodesia; *Diplacodes* paratypes also Brit. Mus. (Nat. Hist.) and in Transvaal Mus., Pretoria. A ♀ of *Trithemis brydeni* is described and figured for the first time (material in National Museum, Bulawayo). Keys to all spp. are also provided.

- (1644) PINHEY, E., 1976. Further notes on the Odonata of Mauritius. *Arnoldia, Rhod.* 8 (9): 1-6. — (*Natl Mus., P.O.B. 240, Bulawayo, Rhodesia*).

Brief field notes are given on 10 spp., particularly on the endemic *Coenagriocnemis* spp. Thoracic structures of *C. rufipes* and *C. insulare* are figured. Mesothoracic tubercles are surprisingly more developed in ♂ than in ♀ of this genus. *Zygonyx torrida* is new to the Malgache group of islands, and appears to represent a distinct ssp. Before naming it, additional material, incl. a ♀ would be required.

- (1645) RIEK, E.F., 1976. A new collection of insects from the Upper Triassic of South Africa. *Ann. Natal Mus.* 22 (3): 791-820. — (*Div. Ent., CSIRO, Canberra, A.C.T., 2601, AU*).

4 new odonopteroidean spp. (1 Meganisopteran, 3 Odonate) are described and illustrated from the Molteno Formation, Upper Triassic, of Bird's River, South Africa. These are as follows: *Triassologus biseriatus* gen. n., sp. n., Paralogidae, Meganisoptera (the genus resembles *Oligotypus* rather than *Paralogus*, with a distinct double row of cells between the uppermost 2 branches of Rs, lower branch of Rs distinctly forked, and MA and MP subparallel until well after the first forking of Rs; type: C-Dt. II 764, apical half of wing, caudally incomplete), *Triassoneura andersoni* gen. n., sp. n., Triassoneuridae fam. n., Protozogyoptera, Odon. (the family differs from the Permagrionidae in the more distal position of the incipient node, the non-development of a subnodus, the non-alignment of the postnodals with the cross-veins behind them and the anastomosis of Cu + A with MP to the lower

corner of the discoidal cell; the spp. of the genus differ in the development and form of the cross-veins, and in size; this is the genotype; type: C-Dt. II 763 a, b, basal half of wing to and including the incipient node, *T. heidiaea* sp. n. (holotype: C-Dt. II 791 a, b, almost complete wing, the nodal area distinct only in the underpart; paratypes: C-Dt. II 762 a, b, 759 a, b, *T. regularis* sp. n. (type: C-Dt. II 760 a, b, almost complete wing, but all areas not clearly visible. All material is in the Bernard Price Inst. In addition, a number of Lepidoptera and Plecoptera are described from the same formation, and a list is given of the hitherto known fauna of the Molteno (33 spp. 12 orders).

- (1646) RIESS, W., H.M. ROTH & G. NITSCHKE, 1976. Rote Liste bedrohter Tiere in Bayern. 1. Fassung. SchrReihe Naturschutz Landschaftspfll., München 1976 (7): 38 pp. — (*Bayerisches Landesamt für Umweltschutz, Rosenkavallierplatz 3, D-8000 München-45, GFR*).

On p. 15 a list is given of odon. spp. that are extinct (1), threatened with extinction (14) and endangered (8) in Bavaria, German Federal Republic. — (*Abstracter's note: For lists considering the whole territory of the GFR cf. OA No. 1672, and Odonatologica 6 [1977]: 97-103*).

- (1647) RUDOLPH, R., 1976. Die Kleinlibelle *Coenagrion lindeni* bei Münster. *Natur und Heimat* 36 (4): 86-87. — (*Fliednerstr. 12, D-4400 Münster, GFR*).

An old ♂ of *C. lindeni* was taken on July 29, 1976, nr. Gelmer, 10 km N of Münster, 500 m off the Ems Riverbank, Westfalia, German Federal Republic. This is the 3rd record of this mediterranean sp. in Westfalia. The first is that of H. Kolbe (1878. *Jber. westf. Prov. Ver. Wiss. Kunst* 6: 55-69), while the second originates from the same author (Rudolph) and has been published in the paper listed in *OA* No. 1073.

- (1648) RYE, R.P., Jr. & E.L. KING, 1976. Acute toxic effects of two lampricides to twenty-

one freshwater invertebrates. *Trans. Am. fish. Soc.* 105 (2): 322-326. — (*Hammond Bay Biol. Stn, US Fish & Wildl. Serv., Millersburg, Mich. 49759, USA*).

Laboratory static bioassays were conducted to determine acute toxicity of 2 lampricides — a 70% 2-aminoethanol salt of 5,2'-dichloro-4'-nitrosalicylanilide (Bayer 73) and a mixture containing 98% 3-trifluoromethyl-4-nitrophenol (TFM) and 2% Bayer 73 (TFM-2B) — to 21 freshwater invertebrates. LC_{50} values were determined for 24 h exposure periods at 12.8°C, *Ophiogomphus* sp. was the only odon. studied. It does not seem to be very sensitive to either of the 2 lampricides.

- (1649) SCHMIDT, E., 1976. Ökosystem See. Das Beziehungsgefüge der Lebensgemeinschaft im eutrophen See und die Gefährdung durch zivilisatorische Eingriffe. *Quelle & Meyer, Heidelberg*. 171 pp. — (*Biol. Seminar, Pädagogische Hochschule, Mürwikerstr. 77, D-239 Flensburg, GFR*).

A slightly revised edition of the volume listed in *OA* No. 616.

- (1650) SMITHERS, C.N., 1976. A record of *Aeshna brevistyla* Rambur (Odonata, Aeshnidae) from Norfolk Island. *Aust. ent. Mag.* 3 (3): 57. — (*Austral. Mus., College Str., Sydney, N.S.W. 2000, AU*).

This is the 5th odon. sp. known to occur on the island. 2 ♂ and 1 ♀, collected in 1968 and 1969 at 3 different localities, are brought on record. Bibliographic references to earlier publications on the odon. fauna of the Norfolk Island are also provided.

- (1651) STARK, W., 1976. Zum Nachweis der mediterranen Grosslibelle *Aeshna affinis* (van der Linden, 1820) in der Steiermark (Ins., Odonata: Aeshnidae). *Z. ArbGem. öst. Ent.* 28 (1/3): 81-82. — (*Goethestr. 28, A-8010 Graz*).

A. affinis is recorded for the first time for Styria, Austria (surroundings of Graz). A few field notes on the behaviour and a brief outline of its distribution in Austria are added.

- (1652) SUGIMURA, M., 1976. [Observations on *Anaciaeschna martini* at Nakamura City, Kochi prefecture]. *Nature and Insects* 11 (6): 33-35. (Japanese). — (*Higashishitacho, Nakamura, Kochi, 786, JA*).
In the Nakamura area this crepuscular sp. is very common, though it is rare elsewhere in Japan. Oviposition takes place during July and Aug. During the first yr the larvae reach a length of 2 cm. The ♂♂ emerge in May of the next yr, and the ♀♀ a month later. Notes of territoriality and sexual behaviour are also provided.
- (1653) SUZUKI, Y., 1976. [Observations on breeding of *Anax parthenope julius*. Parts I, II, III]. *Nature and Insects* 11 (4): 28-31; (5): 20-24; (7): 25-27. (Japanese). — (*3-56-8 Shimozakicho, Yedowagaku, Tokyo, 133, JA*).
A detailed account is given of the laboratory breeding techniques and equipment for this sp., and a case history is provided (oviposition: June 1, hatching: June 16, emergence: Aug. 12).
- (1654) THEISCHINGER, G., 1976. Das erste fossile Insekt aus Oberösterreich eine Libelle? *Jb. oberöst. MusVer.* 121 (I): 287-288, Taf. 26 excl. — (*Biol. Abt. II, Oberösterreich. Landesmus., Museumstr. 14, A-4010 Linz*).
A fossil wing (Inv. Nr. 35/1975; Oberösterreichisches Landesmuseum, Linz, Austria) from the coastal Schieferton (Lower Schlier) deposits, Oligocene-Miocene border, of Egerien, Oberösterreich, Austria, is described and illustrated. Although it is likely that it belongs to a dragonfly, the condition of the fossil is too imperfect to allow a reliable identification of the order.
- (1655) TOMBO. ACTA ODONATOLOGICA. Published by the Society of Odonatology, Tokyo. Vol. 19, Nos. 1-4 (dated December 31, 1967). — (*c/o Dr. S. Asahina, Takanobaba 4-4-24, Shinjuku-ku, Tokyo, 160, JA*).
Asahina, S.: A revisional study of the genus *Mnais* (Odonata, Calopterygidae). VIII. A proposed taxonomy of Japanese *Mnais*; — *Kawaguchi, S.*: *Anax guttatus* of Shizuoka, third report; — *Kohama, T.*: Dragonflies of the Miyako Islands; — *Aisaka, K.*: *Sympetrum depressiusculum* first found from the Inland-Sea side of Hyogo Pref.; — *Koyama, T.*: Zur Konservierung der blauen Farben auf dem Abdomen von *Aeschna nigroflava*; — *Koyama, T.*: Notes on *Macromia amphigena* from the lakes Toya and Shikotsu, Hokkaido; — *Rai, T.*: Corrections and additions to "The Odonata of the Shizen-kyoikuen Forest"; — *Eda, S.*: a new subspecies of *Macromia amphigena* from Hokkaido, Japan; — *Eda, S.*: A male of *Sympetrum frequens* making oviposition with a moribund female; — *Okada H. & T. Tsumagari*: New locality records of two dragonfly species in Aomori Prefecture; — *Kawaguchi, S.*: *Somatochlora clavata* found in Shizuoka; — *Inoue, K.*: New record of *Hemicordulia okinawana* from Amami-oshima; — *Announcement*. — (*Abstracter's notes*: (1) Abstracts of papers and addresses of the authors will appear in *Odonatologica* 6 (3); — (2) Contrary to an earlier announcement (cf. *OA* No. 1300), publication of the journal will be continued), — (3) The subscription price for the current and the 1977 volumes amounts to Y 1500.—, but will be raised to Y 2000.— with vol. 21 (1978); — (4) Back issues are available and orders should be placed with Dr. S. Eda, Dept. Pathol., Matsumoto Dental Coll., 1780 Gobara, Hirooka, Shiojiri, Nagano, 399-07, Japan).
- (1656) TUXEN, S.L., 1976. Odonata. Zoology of Iceland 3 (39a): 1-7. — (*Zool. Mus., DK-2100 Copenhagen*).
Although Odon. are not autochthonous in Iceland, single migrating spec. of *Hemianax ephippiger* were recorded from the island on several occasions. A review is given of the known records and considerations are presented on the circumstances under which incidental immigration has taken place. (Cf. also *OA* No. 1460).

- (1657) UCHIDA, T., 1976. [Notes and field observations on *Anax parthenope julius*], *Nature and Insects* 11 (8): 2-3. (Japanese). – (2182-2 *Izumi, Komae, Tokyo, 182, JA*). In the author's youth, 60 yrs ago, catching this common sp. used to be a popular game in Tokyo. There were 2 methods to collect live specimens: (1) by a bamboo pole, with adhesive on the top, and (2) by using a mature ♀ attached to a black string, allowing her to fly in small circles. When a ♂ grasped her, the string was hauled, and in this way, in a short time, many adult ♂♂ could be collected. A few notes on the territorial behaviour are added. – (*Abstracter's note*: For a similar method used by children on the Banda Neira Island, Indonesia, to collect the local *Anax guttatus* cf. a note by P. Simmons, 1976. *Odonatologica* 5: 285).
- (1658) UEDA, T., 1976. The breeding population of damselfly, *Cercion calamorum* Ris (Odonata: Zygoptera). I. Daily movements and spatial structure. *Physiol. Ecol. Japan* 17 (1/2): 303-312. (Japanese, with Engl. s.). – (*Dept. Zool., Fac. Sci., Kyoto Univ., Sakyo, Kyoto, 606, JA*). The formation process of spatial structure in a population of *C. calamorum* has been analyzed by tracing the daily movements of individually marked mature males. *Cercion* males moved ca. 6 m or less in a day and 2 small sub-populations which were relatively independent were observed in the study area (312 m²). They used 4 high trees close by the water as their roosting sites at night and the tree nearest to the point where they ceased daytime activities was selected. Comparing the daily changes of immigration, suitability of sites for breeding etc., it is considered that 1 of the 2 sub-populations was formed at the most suitable site for breeding in this area. On the other hand, the other sub-population was formed at the site less suitable than the former. This site was situated adjacent to the roosting site and 7-8 m from the most suitable site and the distance was beyond the range of daily movement of adults. It is concluded that suitability of the breeding sites, distribution of the sites and the moving ability of adult are important in the spatial distribution of the species. (Author).
- (1659) UEDA, T., 1976. The significance of male aggressive behaviour in *Cercion calamorum*. *Insectarium, Tokyo* 13: 76-79. (Japanese). – (*Dept. Zool., Fac. Sci., Kyoto Univ., Sakyo, Kyoto, 606, JA*). It is concluded that male aggressive behaviour keeps down the population density and prevents the decrease of mating chances at the suitable site. – (*Abstracter's note*: A larger Engl. summary is available from the author or from the Editors of *Odonatologica*).
- (1660) VERVOORT, W., 1976. Verslag van de Directeur over het jaar 1974. Rijksmuseum van Natuurlijke Historie te Leiden. [Annual report of the Director, 1974. State Museum of Natural History, Leyden]. *Ned. Rijksmus.* 96: 211-274. (Dutch). – (*Rijksmus. Nat. Hist., Raamsteeg 2, Leiden, NL*). The Odon. Department is dealt with on p. 248. The Staff situation was the same as mentioned in the report listed in *OA* No. 1600. New acquisitions include material from Brazil, Spain, Mexico, the Netherlands, etc. Drs. M.A. Liefstinck and D.C. Geijskes, the retired former Curators of the Department, were its sole active collaborators. A list of visitors and research guests is also given.
- (1661) VERVOORT, W., 1976. Verslag van de Directeur over het jaar 1975. Rijksmuseum van Natuurlijke Historie te Leiden. [Annual report of the Director, 1975. State Museum of Natural History, Leyden]. *Ned. Rijksmus.* 97: 189-247. (Dutch). – (*Rijksmus. Nat. Hist., Raamsteeg 2, Leiden, NL*). The Odon. Department is dealt with on pp. 224-225. The Staff situation was the same as mentioned in the report listed in *OA* No. 1600. The collection is considered as being probably the largest in the world. Extensive new acquisitions include material from Australia, France, Guatemala, Iran, Luxem-

burg, Micronesia (Caroline Islands), Netherlands, New Guinea (Irian Jaya), Seychelles, Surinam and Sweden. A list of visitors and research guests, and the bibliography of the Department are also given.

- (1662) ZIEBELL, S., 1976. Libellen aus dem nord-westlichen Niedersachsen (Odonata). *Drosera*, Oldenburg 1976 (1): 13-18. (With Engl. s.). — (*An der Düne 7, D-2992 Dörpen, GFR*).

Data on distribution and seasonal occurrence are presented for 43 spp. of north-western Niedersachsen, German Federal Republic. Of particular interest are records of *Lestes virens*, *Ceriagrion tenellum*, *Erythromma viridulum*, *Orthetrum coerulescens* and *Gomphus pulchellus*. A distributional map of the latter sp. is added. The only earlier review of the odon. fauna of this region is that by H. Lohmann (1965. *Jb. dt. Jugendb. Naturbeob.* 1964/65: 153-165).

- (1663) ZIMMERMANN, W., 1976. Faunistisch-ökologische Analyse der Odonatenfauna westthüringischer Gewässer (Insecta, Odonata). *Abh. Ber. Mus. Nat. Gotha* 1976: 19-47. — (*Museum der Natur, Parkallee 15, DDR-58 Gotha, GDR*).

The odon. fauna of 6 stagnant water basins in western Thuringia, German Democratic Republic, is analyzed from the viewpoints of faunal composition, ecology and zoogeography. — (*Abstracter's note*: For other papers on the odon. fauna of Thuringia cf. *OA* No. 1514).

1977

- (1664) ANDRIÈS, J.-C., 1977. Specialization of the endoplasmic reticulum in the apex of the midgut cells of *Aeshna cyanea* (Insecta, Odonata). *Cell Tissue Res.* 178 (1): 97-101. (*Lab. Biol. anim., Univ. Sci. & Techn., B.P. 36, F-59650 Villeneuve d'Ascq*). Lamellar stacks of cisternae regularly spaced and bound to each other by fine filaments are observed in the apex of midgut cells of *A. cyanea*. These cisternae are

connected with the rough endoplasmic reticulum but are devoid of ribosomes except on their terminal sacs. Their location and their structure, quite different in fed and starved animals, suggest that they are involved in intracellular transport. (Author).

- (1665) ANDRIÈS, J.-C., 1977. Contrôle de la dynamique cellulaire et des remaniements de l'épithélium mésentérique au cours de la mue et de la métamorphose d'*Aeshna cyanea* Müll. (Insecte Odonate). Thesis (Doctorat d'état) Univ. Sci. & Techn., Lyon. 106 pp., 38 pls. excl. — (*Lab. Biol. anim., Univ. Sci. & Techn., B.P. 36, F-59650 Villeneuve d'Ascq*).

The control of cellular dynamics in midgut epithelium during metamorphosis in *A. cyanea* was studied after injections of an analogue of juvenile hormone (farnesyl methyl ether, FME) and of α - and β -ecdysone. The following results were obtained: (1) The programming of the regenerative cells into either reticulate (transitory) or imaginal epithelium takes place from the onset of the last intermoult. Although controlled by juvenile hormone, it requires the presence of ecdysone; — (2) The multiplication of the regenerative cells is controlled by ecdysone; α -ecdysone seems to exert a more specific action on DNA synthesis, whereas β -ecdysone primarily controls the differentiation of these cells; — (3) The reticulate tissue is inhibited by injection of even small doses of β -ecdysone that have the effect of shortcutting this step; the results of injection of β -ecdysone are closer to those observed in controls.

- (1666) BELLE, J., 1977. A new species of *Phyllocycla* Calvert, 1948 from Brazil (Odonata: Gomphidae). *Ent. Ber., Amsterdam* 37 (1): 6-7. — (*Onder de Beumkes 35, Velp-6200, NL*). *P. armata* sp. n. (σ holotype: Itaituba, Pará, Brazil) is described and illustrated. As clearly appears from the conformation of the accessory genitalia and caudal append-

ages, the new sp. belongs to the volsella-group. This group hitherto comprises 4 spp., viz. *Phyllocycla volsella* (Calvert, 1905), *Ph. anduzei* (Needham, 1943), *Ph. titschacki* (Schmidt, 1952), and *Ph. neotropica* Belle, 1970. The principal difference between the ♂ of *Ph. armata* and those of the other members of the group is in the form of the superior caudal appendages which in the ♂ of *Ph. armata* have a conspicuous ante-apical hook at the inner side. (Author).

- (1667) HEIDEMANN, H., 1977. Libellen am Altrhein. Ent. Z. Stuttgart 87 (1/2): 1-8. — (*Au in den Buchen 66, D-7520 Bruchsal-5, GFR*).

The biotope description is given and the odon. fauna is discussed (32 spp.) of a backwater pool of the Rhine, nr. Leopoldshafen, District Karlsruhe, Baden, German Federal Republic.

- (1668) JURZITZA, G., 1977. Das Libellenjahr. Tier 17 (3): 31. — (*Bot. Inst. I, Univ. Karlsruhe, Kaiserstr. 12, D-75 Karlsruhe, GFR*). A book review of the volume listed in OA No. 1563.

- (1669) KÖNIG, D., 1977. Die untere Bollingstedter Au. Jb. Schleswigsche Geest 1977: 23-42. — (*Author's address unknown*).

An outline is presented of the natural history of the lower Bollingstedter Au, Schleswig-Holstein, German Federal Republic. In the chapter on insects (p. 36) a reference is made to *Platycnemis pennipes* and *Calopteryx splendens*.

- (1670) LIEFTINCK, M.A., 1976. Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Odonata. Entomologica Basiliensia 2: 11-37. (Engl.). — (*"Kalliste", Nwe Veenendaalseweg 224, Rhenen-2780, NL*).

This is the first contribution to the knowledge of the odon. fauna of the Kingdom of Bhutan. 6 spp. are listed, incl. *Davidius baronii* sp. n. (♂ holotype, ♀: Changra, 18 km S of Tongsa, 1900 m, 21/23-6-1972)

and *Cephalaeschna triadica* sp. n. (♂ holotype: Gidaphu, 2300 m, 2-6-1972). *Calicnemia murtoni* (Laidl.), *C. miniata* (Sel.) and *C. erythromelas* (Sel.) are also figured and discussed in detail, though only the first of these from the Bhutanese territory. The remaining 3 spp. listed are *Caliphaea confusa* Hag., *Megalestes major* Sel. and *Lestes* (*Indolestes*) *cyaneus* Sel.

- (1671) MACAN, T.T., 1977. The influence of predation on the composition of fresh-water animal communities. Biol. Rev. 52 (1): 45-70. — (*Stevney, Outgate, Ambleside, Cumbria LA22 0NH, UK*).

Although the study of fresh-water communities and the relation between predator and prey is young, and the data are not yet extensive, it is considered that the latter appear adequate enough for some preliminary generalizations. These are given in the present paper, and reference is made to Odon. whenever appropriate.

- (1672) PRETSCHER, P., 1977. Rote Liste der in der Bundesrepublik Deutschland gefährdeten Tierarten. Teil II. Wirbellose 1. Libellen, Odonata (Insekten) (1. Fassung). Natur und Landschaft 52 (1): 10-12. — (*Inst. Naturschutz & Tierökol., Bundesforschungsanstalt f. Naturschutz u. Landschaftsökol., Heerstr. 110, D-5300 Bonn-Bad Godesberg-1, GFR*).

A classified list is given of 42 spp. that are endangered in the territory of the German Federal Republic. 35 of these (constituting 50% of the total odon. fauna of the country) are autochthonous, while 7 spp. are classified as breeding immigrants.

- (1673) PROVONSHA, A.V. & W.P. McCARTHY, 1977. Odonata from Hot Brook, South Dakota, with notes on their distribution patterns. Ent. News 88 (1/2): 23-28 — (*Dept. Ent., Purdue Univ., Lafayette, Ind. 47907, USA*).

10 spp. are reported for the first time from Hot Brook, South Dakota, USA, 4 of which are new state records. The warm spring environment can account for the disjunct

range extension of several spp. The North American biogeography of each spp. is briefly discussed and 4 distributional maps are provided.

- (1674) TEMBHARE, D.B. & V.K. THAKARE, 1977. Neurosecretory system of the ventral ganglia in the dragonfly, *Orthetrum chrysis* (Selys) (Odonata: Libellulidae). *Cell Tiss. Res.* 177 (2): 269-280. — (c/o Prof. H. Kornick, *Inst. Cytol. & Micromorphol., Univ. Bonn, Ulrich-Haberland-Str. 61 a, D-53 Bonn-1, GFR*).
The neurosecretory cells of the ventral

ganglia in the adult *O. chrysis*, are classified into A, B, C1 and C2 cells. The neurosecretory material in the ventral ganglia is composed of PAS-positive material with 1-, 2-glycol groups and some proteins. The proteins rich in cystine or cysteine occur predominantly in the A cells, moderately in C cells and negligibly in B cells. Proteins containing arginine occur in A and B cells only, and those containing basic amino acids occur in C2 cells. The neurosecretory pathways and the neurohemal organs are also described. (Authors).