

ODONATOLOGICAL ABSTRACTS

1971

- (200) ASAHINA, S., 1971. Insects collected at the Fuji Meteorological Station on the summit of Mt. Fuji. Fuji-san (Results of the cooperative scientific survey of Mt. Fuji), Tokyo, pp. 734-737. (Japanese, with Engl. s.). — (*Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA*). Among more than 40 insects spp. collected at the summit of Mt. Fuji, Japan, several specimens of *Anotogaster sieboldii* and a hybrid specimen of *Sympetrum* were noted. They seem to be brought by the ascending air currents.
- (201) AVETIAN, A.S., 1971. A list of new taxa of insects and mites (Insecta et Acari) published in Armenia from 1920 to 1970. Ent. Obozr. 50: 931-939. (Russian, with Engl. translation of the title). — (*Inst. Zool., Acad. Sci. Armenian SSR, Ul. Gastello 7, 375044 Yerevan — 44, Armenia, USSR*). The list includes bibliographic references on 2 odon. ssp. described by N.N. Akramowski in Zool. Sb., Erevan, vol. 5 (1948), viz. *Calopteryx splendens erevanense* (pp. 138-142) and *Sympetrum flaveolum austrium* (pp. 173-176).
- (202) BALESTRAZZI, E. & I. BUCCIARELLI, 1971. Ricerche faunistiche sulle Torbiere d'Iseo. I. Sulla presenza di una colonia di *Leucorrhinia pectoralis* (Charp.). Boll. Soc. ent. ital. 103 (9): 159-166. — (*Via Lanfranco 26, I-27100 Pavia*). Detailed observations on the ecology, behaviour and morphology of *L. pectoralis* of the Torbiere d'Iseo nr. Brescia, Lombardy, Italy, are recorded. The locality harbours the first known large Italian population of this species, which in this country was known from 3 museum specimens collected nr. Treviso and Triest only.
- (203) BALESTRAZZI, E. & I. BUCCIARELLI, 1971. Ricerche faunistiche sulle Torbiere d'Iseo. II. *Nehalennia speciosa* (Charp.), genere nuovo per la fauna italiana. Boll. Soc. ent. ital. 103 (10): 195-198. — (*Via Lanfranco 26, I-27100 Pavia*). A colony of *N. speciosa* was discovered at the Torbiere d'Iseo nr. Brescia, Lombardy, Italy. The sp. inhabits *Carex* and *Phragmites* meadows, where observations were carried out on its behaviour in July, 1970. The usual measurements are stated for both sexes.
- (204) BUCCIARELLI, I., 1971. Presenza in Sicilia di una colonia di *Selysiothemis nigra* (v.d. Lind.) e note su altre specie raccolte nell'isola e nell'Italia meridionale. Boll. Soc. ent. ital. 103 (9): 175-185. — (*Mus. Civ. Stor. Nat., Corso Venezia 55, I-20121 Milano*). From May 31 — June 10, 1969 and from May 1 — 8, 1970, 26 spp. were collected at 16 localities in Sicily and southern Italy. The ecology of each locality is briefly described and the composition of the odon. fauna is stated. In the systematic part the records are discussed in some detail and the usual measurements are given for *Calopteryx haemorrhoidalis*, *Lestes dryas* and *Selysiothemis nigra*. The latter two spp. and *Coenagrion mercuriale castellanii* are of particular interest: *C. m. c.* is new to the fauna of Sicily,

L. d. represents the second record for the island, while a large population of S. n. was observed at a brackish lake SE of Gela, Sicily.

- (205) CONNOR, W.F., 1971. Marking and recapture techniques for adult Odonata. Can. Fld Nat. 85 (1): 68-70. — (*School Forestry, Yale Univ., 205 Prospect Str., New Haven, Conn. 06511, USA*).

Previously used marking materials, methods and codes are summarized and new techniques as used by the author on Libellula quadrimaculata are described.

- (206) CROVETTI, A., 1971. Risultati delle missioni entomologiche dei proff. G. Fiori ed E. Mellini nel Nord-Africa. XXIV. Note ecotologiche sulla entomofauna primaverile dello Uádi Caâm (Tripolitania). Studi Sassaesi, III, 18: 270-381. — (*Ist. Ent. Agrar., Univ. Sassari, Sassari, Italy*).

Biological and ecological notes on the spring insect fauna of the Wadi Qaam, Libya, made in May, 1963 are reported. Though the paper deals mostly with Coleoptera, Orthoptera and Hymenoptera, Odon. are also briefly referred to. With regard to the activity of the adults over the 24-hr period, dragonflies fall into the group of diurnal insects, active throughout the year, even during periods of maximum sunshine.

- (207) DUTMER, G., 1971. Libellen. Waarom, hoe en wat? (Dragonflies. Why, how and what?). Anax 3 (1): 2-5, 20, (Dutch). — (*Poststraat 1, Wildervank, NL*).

Instructions for faunistic inventarisation and population density studies in the journal of the (Dutch) "Christian Youth Federation of Nature Friends" (C.J.N.).

- (208) FULLNER, R.V., 1971. A comparison of macroinvertebrates collected by basket and modified multiple-plate samplers. J. Water Pollut. Cont. Fed. 43: 494-499. — (*Environ. Protect. Agency, Region III, Wheeling Field Office, 303 Methodist Bldg., Wheeling, WV 26003, USA*).

Benthic macroinvertebrates (including representatives of the odon. genera Ischnura, Enallagma, Chromagrion, Argia, Pantala and

Neurocordulia) were collected in the Ohio R. and several of its major tributaries, USA, from May to Oct 1968, using basket and modified multiple-plate samplers. Data are presented which compare the effectiveness of the 2 types of samplers. The results indicate that the modified multiple-plate sampler is more convenient and not less efficient for sampling in large streams and in rivers.

- (209) GLOYD, L.K., 1971. Gynandromorphism in the Odonata. Michigan Entom. 4 (3): 93-94. — (*Mus. Zool., Univ. Michigan, Ann Arbor, Michigan 48104, USA*).

A summary is given of gynandromorphic odon. specimens recorded in the literature: 2 in Calopterygidae, 1 in Aeshnidae and 6 in Libellulidae. To these is added another example, which is the first for Corduliidae and the second for North America. Of the 8 specimens for which data are available, 6 are predominantly ♀, 1 is about half and half, and 1 predominantly ♂.

- (210) HAMRUM, C.L., M.A. ANDERSON & M. BOOLE, 1971. Distribution and habitat preference of Minnesota dragonfly species (Odonata, Anisoptera). II. J. Minn. Acad. Sci. 37 (2-3): 93-96. — (*Biol. Dept., Gustavus Adolphus Coll., Saint Peter, Minn. 56082, USA*).

Among 70 anisopteran spp. listed 5 represent new records for the State, viz. Dromogomphus spinosus, Gomphus quadricolor, G. ventricosus, Boyeria grafiana and Neurocordulia molesta. Habitat zones are described and the distribution of spp. in the various counties is recorded.

- (211) KOCHMAN, M., U. KRZYWDA, D. KWIATKOWSKA & T. BARANOWSKI, 1971. Multiple molecular forms of fructose diphosphate aldolase in ontogeny and phylogeny. Int. J. Biochem. 2: 221-231. — (*Dept. Biochem., Med. School Wrocław, Chalubińskiego 10, Wrocław, PO*).

Tissue distribution of parental aldolases A, B and C and their hybrids was studied by means of electrophoresis in various vertebrate and invertebrate spp., the latter including a re-

- representative of Nemathelminthes, Gastropoda, Annelida, Odon. (*Calopteryx virgo*), Orthoptera, Grylloblattodea, Coleoptera and Hymenoptera each. In invertebrates one molecular form of aldolase was found in muscle, eye and intestine tissues; aldolase multiplicity was detected, however, in *Ascaris summi* (Nemath.), *Lumbricus terrestris* (Annel.), *Calopteryx virgo* (Odon.) and *Melolontha melolontha* (Col.). In the *C. virgo* eye extract 2 activity bands were found, one of them corresponding to that found in muscle. In most spp. the highest FDP/F-1-P activity ratios were found in muscle (ranging from 20 in Gastrop. to 96 in *Calopteryx*), the lowest in the intestine and intermediate in the eye. For *C. virgo* illustrations are given of electrophoretic profiles in extracts of muscle and eye. It is suggested that some spp. may exhibit some tissue specificity and functionally different forms of aldolase.
- (212) KRYLOVA, V.N. & P.A. CHIROV, 1971. O roli strekoz v snizhenii chislennosti nekotorykh krovososushchikh nasekomykh Tjan'-Shanja. (On the role of dragonflies in the numerical control of some blood-sucking insects in Tien-Shan). In: Materialy po chlenistonogim-entomofagam Kirgizii, pp. 92-94. Ilim, Frunze. (Russian). — (*Inst. Biol., Acad. Sci. Kirghiz SSR, Ul. 22nd-Party-Congress 265, 720040 Frunze, Kirghiz SSR, USSR*). Tabanidae and other blood-sucking insects are extensively preyed upon by dragonflies. The most aggressive spp. are *Aeshna affinis* and *A. coluberculatus*, but representatives of the genera *Anax*, *Orthetrum*, *Crocothemis* and *Sympetrum* also take part in numerical control of winged blood-suckers. No quantitative data are given.
- (213) MALLIS, A., 1971. American entomologists. Rutgers Univ. Press, New Brunswick, N.J., 549 pp. — (Publisher's address: 30 College Ave., New Brunswick, N.J. 08903, USA). This is the most extensive biographical reference for N. America. It presents biographical sketches of 203 entomologists, from pioneer times to present. The sketches describe their major accomplishments, their background and education, their professional affiliations and their outstanding characteristics. There are no bibliographies, but most biographies are accompanied by a portrait. Among others, the following important odonatologists are treated: T. Say (1787-1834), S.H. Scudder (1837-1911), A.P. Morse (1863-1936), J.G. Needham (1868-1957), P.P. Calvert (1871-1961), E.B. Williamson (1877-1933).
- (214) MUIZELAAR, P. & M. DE SCHIFFART, 1971. Libellen inventarisatie bospoel Sint Nicolaasga. (Dragonfly inventarisation at the forest pool Sint Nicolaasga). *Anax* 3 (1): 12-13. (Dutch). — (*Gajes Nautastraat 57, Sneek, NL*).
14 spp. are listed for this locality that is situated nr. the village of Huis ter Heide, Friesland prov., Netherlands. Phenological notes are added (Dutch).
- (215) OOSTERWAAL, L. & J. (MUILWIJK), 1971. Libellenverslag ... Mariapeel ... 1970. (Dragonfly report ... Mariapeel ... 1970). *Anax* 3 (1): 6-8. (Dutch). — (*Uilenstede 4, K-2, Amstelveen, NL*).
Report on observations carried out in May, 1970 by members of the (Dutch) "Christian Youth Federation of Nature Friends" (C.J.N.) in the marshes Mariapeel, N. Brabant prov., Netherlands, with special reference to predation on dragonflies. Ants are considered the most important predators on the emerging dragonflies in the area.
- (216) PASK, W.M. & R.R. COSTA, 1971. Efficiency of sucrose flotation in recovering insect larvae from benthic stream samples. *Can. Ent.* 103: 1649-1652. — (*Chanute Tech. Training Center, Chanute AFB, Rantoul, Ill., USA*).
Duplicate benthic stream samples were collected from three sites on Sandy Creek, Lake Ontario Watershed, Western New York, USA, September 8 and 22, 1970. Samples taken on 8 September were preserved in 10% formalin, the others were not preserved. Insect specimens were removed from both sets by flotation with a sucrose solution of 1.12 sp. gr. Preserved and unpreserved

samples were compared for efficiency of recovery of insect larvae. Mean recovery for preserved samples was 90.78% compared with 83.03% for unpreserved samples. The range of recovery values for unpreserved samples (66.7%) was more than twice as great as that of preserved samples (29.5%). A paired t-test for means of all taxa showed no significant difference ($P < 0.001$) between recovery values for preserved and unpreserved samples. In fact, preservation may enhance the recovery of Zygoptera, Hemiptera, Trichoptera, and Chironomidae. Apparently samples may be preserved without sacrificing recovery of any specific groups of insect larvae. (Authors).

- (217) PINHEY, E., 1971. Contribution à la faune du Gabon. Mission A. Villiers, 1969. Bull. Inst. fr. Afr. noire 33, A (4): 959-968. (Text in Engl.). — (*National Mus., P.O.B. 240, Bulawayo, Rhodesia*).

The material collected in 1969 at various Gabon localities includes 19 spp. of Proto-neuridae, Coenagrionidae, Calopterygidae, Chlorocyphidae, Gomphidae and Libellulidae. Among these *Neurogomphus angustisigna* (♂ Mvoum) and *Paragomphus aureatus* (♂ Muni, Mts de Cristal) are new. They are described and illustrated on the basis of a single specimen each; the ♀ are unknown. The types are in the Paris Museum.

- (218) RESSL, F., 1971. Zur entomologischen Erforschung des Hochmoores Leckermoos im Hochtal bei Göstling a. d. Ybbs (N.Ö.). Z. ArbGem. öst. Ent. 23: 61-62. — (c/o Dr. A.F. Tauber, Linzerstrasse 342, A-1140 Wien).

The nature of the habitat of the Leckermoos moor in the Hochtal, Lower Austria, is briefly described and records of 2 odon. spp. are reported, viz. *Coenagrion hastulatum* and *Somatoclora alpestris*. The latter is new to the fauna of the prov. of Lower Austria and so is probably also the former.

- (219) SCOTT, R.R., 1971. The larval instars of *Xanthocnemis zealandica* (Odonata: Coenagrionidae). N.Z. Ent. 5: 38-46. — (c/o Ent. Div., DSIR, Private Bag, Nelson, NZ).

Using the same range of characters as employed by Corbet (1955. Proc. R. Ent. Soc. Lond., A, 30: 115-126) the larval instars (usually 13) of *X. zealandica* are described and illustrated. Material originates from Western Springs Lake, Auckland, New Zealand. The only character that can be used in the field for identification of instars is the number of abdominal segments covered by the wing sheaths. Save for the 8th and 9th instars, all instars can be determined by at least one character other than a physical measurement.

- (220) SMITH, W.A., 1971. Tiger beetle larva captures dragonfly. *Cicindela* 3: 80. — (*R.R.2, Tipperary Rd., Poynette, Wis. 53955, USA*).

Near Brule, Wisconsin, USA, in June, 1971, a 3rd instar larva of *Cicindela scutellaris* in its burrow was found to be holding an adult, not further identified *Gomphus* by one wing. Despite vigorous beating of the wings the dragonfly was unable to escape. Attempted predation on alighted dragonflies is likely to be fairly common.

- (221) ST. QUENTIN, D., 1971. Zum Vorkommen von *Cordulegaster insignis* Schneider in Rumänien. *Studii Com. st. nat. Muz. Brukenthal* 16: 205-208. (With Rumanian s.). — (*Naturhist. Mus. Wien, Burgring 7, A-1014 Wien*).

The ♂ specimen from Comana nr. Bucarest, Romania, listed by P. Kempny as *C. insignis* (1906. *Bul. Soc. st. Bucuresti* 14: 667-669) and at present in the collections of the Natural History Museum of Vienna, is described and illustrated. Since it deviates in structure from all known European and Asiatic forms of this sp., a new ssp. is proposed under the name *C. i. montandoni*.

1972

- (222) AITA, M., 1972. (Observations on the emergence of *Sieboldius albardae*). *Gekkan Mushi* 15: 32-36. (Japanese). — (2-6 *Sakae-machi, Ichinomiya-shi, Aichi Pref., JA*). During 1968 and 1969 the author recorded

- 631 cases of emergence (390 ♂, 241 ♀), taking place between June 1 and July 20, with a peak on June 8. The emergence of *S. albardae* is of the "hanging type" in Eda's classification.
- (223) ASAHINA, S., 1972. *Mortonagrion hirosei*, the last new dragonfly species from Japan? *Kontyû* 40 (1): 11-16. — (*Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA*).
M. hirosei n. sp., discovered at a seaside lagoon, Hinuma nr. Mito, Ibaraki Prefecture, approx. 100 km NE of Tokyo, and at two localities nr. Iwanuma, Miyagi Prefecture, Japan, is described and illustrated ♂ ♀. ♀ ult. inst. larva, exuviae). It seems related in structure of ♂ caudal appendages and prothoracic feature, to *M. appendiculatum* Lieft. (Billiton) and less so to *M. forficulatum* Lieft. (Borneo). The contrasting characters for separation of the new sp. from other members of the genus are stated. The type material is in the author's collection. The sp. is confined to the dense reed vegetation of the seaside marshy swamps at the localities mentioned. (Cf. also *OA* Nos. 237 and 282).
- (224) AUTRUM, H. & G. KOLB, 1972. The dark adaptation in single visual cells of the compound eye of *Aeschna cyanea*. *J. comp. Physiol.* 79 (3): 213-232. — (*Zool. Inst., Univ. München, Luisenstrasse 14, D-8000 München-2, GFR*).
 The effect of light and dark adaptation on the receptor potentials of single visual cells is described. Light adaptation for several seconds is followed by an afterpotential which is generally depolarising but may be hyperpolarising. In all cases sensitivity is reduced, recovering slowly during dark adaptation. With the proviso that the intensity must not be so high as to cause light adaptation, higher intensity test stimuli paradoxically accelerate dark adaptation. It is suggested that this is probably due to the reisomerization of the visual pigment by light. Cells in the ventral part of the eye are rather more sensitive than those in the dorsal region.
- (225) BELLE, J., 1972. Further studies on South American Gomphidae (Odonata). *Tijdschr. v. Ent.* 115 (5): 217-240. — (*Onder de Beumkes 35, Velp, Gld., NL*).
 Among the 27 spp. recorded, *Aphylla boliviana* sp. n. is represented by ♀ only, while of *Phyllocycla vesta* sp. n. and *Phyllocycla propinqua* sp. n. both sexes are present. The latter was previously considered no more than an eastern form of *Phyllocycla viridipleuris* (Calvert). More individuals of other spp., hitherto only known from the types, are recorded. The ♀ of others are described for the first time. The genera *Agriogomphus* Selys and *Cyanogomphus* Selys are briefly re-diagnosed with partly new characters. (Author).
- (226) BELYSHEV, B.F., 1972. Geofizicheskaya teoriya Vegenera kak osnova k ponimaniyu sovremennogo rasprostraneniya odonatofauny i ee istorii. (Wegener's geophysical theory as basis for the understanding of the present day odonate distribution and its history). *Izv. zabaikal. Fil. geogr. Obshch. SSSR* 5, 1969 (2): 28-34. (Russian). — (*Biol. Inst., Siberian Branch USSR Acad. Sci., Ul. Frunse 11, Novosibirsk - 91, USSR*).
 The continental drift hypothesis of A. Wegener (1915. *Die Entstehung der Kontinente und Ozeane*. Vieweg, Brunswick; — Translation: 1924. *The origin of continents and oceans*. Methuen, London), suggesting the possibility that all continents originated in one coherent land mass which later split up and drifted apart, and that they are continuing to drift, is discussed from the point of view of odon. distribution, chorogeography and (infra)speciation. The author analyzes the subject in 6 points and arrives at the conclusion that the odonatological evidence strongly supports Wegener's views. The points considered are: (1) spp. found on both sides of the Bering Straits occur also in Europe, (2) occurrence of isolated ranges of allied spp. in E. Asia and E. North America, (3) disappearance of yellow spots in Eurasia from W towards E, (4) chorogeographic affinities between the Hawaiian and S.

Asiatic odon. faunas, (5) occurrence of paleogenic elements (sensu Tillyard) in the Pacific region and its vicinity, and (6) close affinities of N. European and E. Siberian faunas on one side, but distinction between the former and that of the Mediterranean Region, on the other.

- (227) (CORBET, P.S.), 1972. International Odonatological Society. Bull. Ent. Soc. Can. 4 (1): 12. — (Dept. Biol., Fac. Sci., Univ. Waterloo, Waterloo, Ont., CA).
Announcement of the foundation of S.I.O. and its journal Odonatologica, with details on membership and on the publication plan of the journal. (Text the same as OA No. 228).
- (228) (CORBET, P.S.), 1972. Announcing the formation of the International Odonatological Society and its journal. Bull. Ent. Soc. Am. 18 (1): 6. — (Dept. Biol., Fac. Sci., Univ. Waterloo, Waterloo, Ont., CA).
Text the same as OA No. 227.
- (229) (DRAGONFLIES). Published by the Tombow Pencil Co., at the occasion of the 60th anniversary of its foundation. 1972 (Japanese). — (c/o Dr. S. Eda, Editor, 2-7-5-208 Sodegaura, Narashino-shi, Chiba Pref., JA).
Popular text on dragonflies, with numerous colour photographs by S. Eda.
- (230) DUTMER, G., 1972. 1967-1972: Vijf jaar libellenwerk. (1967-1972: Five years of dragonfly work). Anax 4 (1): 15-17. (Dutch). — (Poststraat 1, Wildervank, NL).
In the framework of the (Dutch) "Christian Youth Federation of Nature Friends" (C.J.N.) since 1967 various field observations and faunistic inventarisations were made by the members of the Federation at about 150 localities throughout the Netherlands. The central administration of faunistic data is taken care of by the author. Technical instructions are given for further collecting of faunistic records and a list is appended of the 68 spp. hitherto recorded from the country.
- (231) DUTMER, G., 1972. Libellen — enige aanvullende opmerkingen. (Dragonflies — some additional notes). Anax 4 (2): 3-12. (Dutch). — (Poststraat 1, Wildervank, NL).
Annotations on the distribution of 68 spp. in the Netherlands, with bibliographic list of Dutch faunistic papers that have appeared after the publication of the first part of Liefstinck's Odonata Neerlandica (1925. Tijdschr. v. Ent. 68: 61-174).
- (232) DUTMER, G., 1972. Libellen (Odonata) uit het gebied rond Winterswijk. (Dragonflies [Odonata] from the surroundings of Winterswijk). Jaarboek C.J.N. 1971, pp. 171-173. (Dutch). — (Poststraat 1, Wildervank, NL).
Annotated list of 25 spp. collected in July, 1971 in the surroundings of the town of Winterswijk, Gelderland prov., Netherlands. The mesotrophic marshes of the area harbour several spp. that in the Dutch fauna are rare, viz. Platycnemis pennipes, Coenagrion hastulatum, Ceriagrion tenellum and Leucorrhinia pectoralis.
- (233) EDA, S., 1972. (Review of odonatology in Japan in 1971) Gekkan Mushi 10: 13-14. (Japanese). — (2-7-5-208 Sodegaura, Narashino-shi, Chiba Pref., JA).
Chronicle of the Japanese odonatological achievements and events in 1971. (Cf. also OA No. 235).
- (234) EDA, S., 1972. (Japanese dragonflies of the genus Anax). Animal Life 48: 1326-1328. (Japanese). — (2-7-5-208 Sodegaura, Narashino-shi, Chiba Pref., JA).
A series of colour photographs with explanatory text.
- (235) EDA, S., 1972. (Review of odonatology in Japan in 1971). Nature and Insects 7 (1): 5-6. (Japanese). — (2-7-5-208 Sodegaura, Narashino-shi, Chiba Pref., JA).
Chronicle of the Japanese odonatological achievements and events in 1971. (Cf. also OA No. 233).
- (236) EDA, S., 1972. (Report on the 16th Annual Meeting of the Japanese Society of Odonatology). Nature and Insects 7 (1): 17. (Japanese). — (2-7-5-208 Sodegaura, Narashino-shi, Chiba Pref., JA).
The meeting was held at Suita near Osaka, on November 15, 1971 and was attended by 28 members. (Cf. also OA No. 137, where 32 participants are reported).

- (237) EDA, S., 1972. A male of *Mortonagrion hirosei* Asahina. *Nature and Insects* 7 (2): cover. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
A photograph. For the description of this recently discovered sp., Cf. *OA* No. 223.
- (238) EDA, S., 1972. (Announcement of the foundation of the periodical, *Odonatologica*). *Nature and Insects* 7 (3): 7. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
Introduction of the new quarterly journal of the Societas Internationalis Odonatologica to Japanese readers.
- (239) EDA, S., 1972. (Gomphid dragonflies). *Animal Life* 62: 1734-1736, fig. on cover. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
A series of colour photographs with explanatory text.
- (240) EDA, S., 1972. (Japanese dragonflies of the genus *Orthetrum*). *Animal Life* 65: 1815-1817. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
A series of colour photographs with explanatory text.
- (241) EDA, S., 1972. A male of *Libellula quadrimaculata* asahinai Schmidt. *Nature and Insects* 7 (6): cover. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
A photograph.
- (242) EDA, S., 1972. (Famous ecologist, Professor P.S. Corbet, will come to Japan). *Nature and Insects* 7 (7): 26. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
On his way to the 14th Int. Congr. Ent. (Canberra, Australia), the odonate ecologist Prof. Corbet (Univ. Waterloo, Canada), visited Japan from August 13-18, 1972. (Cf. also *OA* No. 243).
- (243) EDA, S., 1972. (World famous odonatologist, Professor P.S. Corbet, will come to Japan). *Gekkan Mushi* 17: 37. (Japanese). — (2-7-5-208 *Sodegaura, Narashino-shi, Chiba Pref., JA*).
On his way to the 14th Int. Congr. Ent. (Canberra, Australia), Prof. Corbet (Univ. Waterloo, Canada), author of numerous ecological and behavioural studies on Odon., and of the book "A biology of dragonflies" (1962, Witherby, London), visited Japan from August 13-18, 1972. (Cf. also *OA* No. 242).
- (244) EJIMA, M., 1972. (A record of *Anax guttatus* from Nagasaki Pref.). *Gekkan Mushi* 12: 37. (Japanese). — (2-1-105 *Izumicho, Nagasaki-shi, JA*).
A note on a ♂ taken at Fukuejima Island, Nagasaki Pref., Japan, on Aug. 23, 1970.
- (245) FAUCHEUX, M.J., 1972. Relations entre l'ultrastructure de l'intima cuticulaire et les fonctions des sacs aériens chez les insectes. *C.R. Acad. Sci. Paris (D)*, 274: 1518-1521. — (*Lab. Zool., UER Sci. Nat., 38 bd Michelet, B.P. 1044, F-44 Nantes*).
Scanning-electron-microscope studies on the relationship between the ultrastructure of the cuticular intima and the functions of the air sacs in adult representatives of 6 insect orders, including *Aeshna cyanea* and *Sympetrum vulgatum* are reported and the structure of the intima of the air sacs is described. The structure and distribution of air sacs point to their possible role in respiration and flight.
- (246) FISCHER, C., 1972. Beitrag zur Odonatenfauna der Lüneburger Heide mit besonderer Berücksichtigung der dortigen Funde von *Somatochlora arctica* (Zetterstedt). *Beitr. Naturk. Nieders.* 25 (1): 9-17. — (*Schulweg 1, D-238 Schleswig, GFR*).
A list is presented of 19 odon. spp. collected in the summer of 1971 at the Lüneburger Heide, NSG, German Federal Republic. Of particular interest is *Somatochlora arctica*. Breeding conditions of this sp. in the area are discussed and it is suggested that the advancement of swamp succession in some marches exercises a negative influence on its abundance.
- (247) GIESEL, J.T., 1972. Sex ratio, rate of evolution, and environmental heterogeneity. *Am. Nat.* 106: 380-387. — (*Dept. Zool., Univ. Florida, Gainesville, Florida 32601, USA*).

The potential for fast evolution is discussed in spp. with higher mortality in ♂♂ than ♀♀. Population data for the zygopteran, *Ischnura ramburii*, form part of the author's evidence.

- (248) GLAS, G. & M. VERDONK, 1972. Zomerkamp Drenthe. Libellen. (Summer camp Drenthe. Dragonflies). Jaarboek C.J.N. 1971, pp. 151-158. (Dutch). — (*Olympiade 54-II, Amsterdam, NL*).
Report on the population structure of 4 zygopteran spp. as observed in July, 1971 by members of the (Dutch) "Christian Youth Federation of Nature Friends" (C.J.N.) near the village of Norg, Drenthe prov., Netherlands. A detailed description of the mating behaviour of *Enallagma cyathigerum* and a list of 16 spp. recorded in the area are appended.
- (249) GOURANTON, J. & D. THOMAS, 1972. Présence de cristaux protéiques intranucléaires et intracytoplasmiques dans l'intestin moyen de *Sympetrum depressiusculum* Sel. (Odonates). C.R. Acad. Sci. Paris (D), 274: 1843-1845. — (*Groupe Rech. Biol. Cell., Fac. Sci., Univ. Rennes, av. du Général Leclerc, F-35 Rennes*).
Protein crystals, fusiform in longitudinal and hexagonal in transverse section, were found in the nuclei and, less often, in the cytoplasm of cells from the midgut of larvae of *S. depressiusculum*. The crystals are 5-7 μ long and 2-3 μ wide, and they do not occur in the youngest cells. No viral particles were seen.
- (250) GROENEWEG, G., 1972. Verslag insektenwerk Ardennenkamp te Ratum. Libellen. (Report on the entomological work in the camp at Ratum in the Ardennes. Dragonflies). Jaarboek C.J.N. 1971, pp. 126-127. (Dutch). — (*Kr. Nieuwstraat 22, Oost Souburg, NL*).
A list of 13 spp. collected in July, 1971 by members of the (Dutch) "Christian Youth Federation of Nature Friends" (C.J.N.) at 4 localities in the Ardennes, 3 of these situated in Belgium and 1 in the German Federal Republic.
- (251) HEYMER, A., 1972. Comportements social

et territorial des Calopterygidae (Odon. Zygoptera). Ann. Soc. ent. Fr. (N.S.) 8 (1): 3-53. — (*Lab. d'Ecol. Gen., Mus. Natl d'Hist. Nat., 4 av. du Petit Château, F-91 Brunoy*).
The reproductive and territorial behaviour of *Calopteryx haemorrhoidalis* and *C. xanthostoma* were studied on a 500 m stretch of the R. Banyul, France, by marking individuals. Both spp. occur only in narrow stretches of clean and oxygen-rich water. During the pre-reproductive stage the adults form social groups. The basic spatial orientation is via a light-compass reaction by the sun. During unfavourable weather and at night the adults shelter in vegetation. When it rains they hang vertically under leaves, and under overcast skies they take up a characteristic wing-posture. On attaining sexual maturity the adults leave the social group and show reconnaissance behaviour. The ♂♂ seek out suitable territories in which they wait for ♀♀ to be attracted; they do not seek them actively. The boundary of a territory is marked out by a special flight-path which is flown over many times in the course of a day. The boundary of the oviposition-site is also marked optically. Within the territory the ♂ has one chief resting-place and several minor ones. At night the ♂ leaves for a common roosting-site and then returns to the territory in the morning. Next to the territory of a given ♂ there is always a neutral zone where no sexual interaction occurs. Hostility is shown towards intruders and rivals only within the territory, and it follows a definite pattern. Fights resulting in damage do not occur. Once occupied, a territory is maintained for a long time. 3 groups of ♂♂ are distinguished: (1) ♂♂ which, largely due to unfavourable environmental conditions, abandon their territories and at intervals become social but in which a strong bond to the territory remains, the territory becoming re-occupied; (2) ♂♂ which are forced to abandon their territory to victorious rivals and then constantly fly about looking for a new one; (3) ♂♂ which are little affected by adverse environmental stimuli and are successful in encounters with rivals, so retaining

the same territory for a long time. The maximum times for which the territories of 4♂♂ were maintained without interruption were respectively 16, 17, 18 and 19 days. The lifespan of an adult averages 25-30 days, consisting of pre-reproductive phase (10 days), reproductive period (16-19 days) and a short post-reproductive phase. The oldest ♂♂ of *C. haemorrhoidalis* were aged 37 and 39 days. The distance between the roosting-site and the territory indicates that memory is involved and that landmarks are important, since the territory itself can be recognized by its individual elements.

- (252) IJIMA, K., 1972. (Insect fauna of the Kushiro Moor and its surroundings). Bull. Kushiro Mus. 215: 1-5. (Japanese). — (*Futatsu-yama, Shibecha-machi, Kushiro, Hokkaido, JA*).

The list of insects, collected at Kushiro Moor, Hokkaido, Japan, includes 44 odon. spp.

- (253) JOHNSON, C., 1972. Tandem linkage, sperm translocation, and copulation in the dragonfly, *Hagenius brevistylus* (Odonata: Gomphidae). Am. Midl. Nat. 88: 131-149. — (*Dept. Zool., Univ. Florida, Gainesville, Florida 32601, USA*).

Structures involved in tandem linkage, sperm translocation, and copulation of *H. brevistylus* are described. Comparative measurements, morphological topography and dissections reconstructed the processes and identified function for participating structures. Erection of the penis results from muscle action flexing the 3rd abdominal sternite, thus transmitting movement to the articulated penis vesicle. Hamules support the penis erection during sperm translocation and copulation; they have little likelihood of engaging the ♀ genitalia. The genital pore of the ♂ and ♀ opens with an anterior and posterior orientation respectively. The C-shaped penis must engage both ♂ and ♀ genital pores and has 2 orifices suited to the requirement. The proximal meatus of the penis receives sperm from the ♂ genital pore and the distal meatus of the penis releases sperm into the ♀ bursa. Hitherto undescribed

abdominal teeth on the 7th and 8th segments occur in Hageninae. They are possibly vestiges of an early stage in evolution of the odon. copulatory process. Papillae of an unknown function exist at the base of each antenna. (Author).

- (254) KANZAWA, M., 1972. (Dragonflies of Tsubetsu-machi, Hokkaido). Nature and Insects 7 (8): 35. (Japanese). — (*13-7 Shonincho, Wakiya-machi, Tohda-gun, Miyagi Pref., JA*).

A list of 8 spp. collected in 1971.

- (255) KASYMOV, A.G., 1972. Presnovodnaia fauna Kavkaza. (Fresh-water fauna of the Caucasus). Elm, Baku. 288 pp., 1 tab. excl. Odonata pp. 97-102. (Russian). — (*Inst. Zool., Acad. Sci. Azerbaijan SSR, Ul. Krylova 5, 370122 Baku, USSR*).

A catalogue of 59 odon. of the Caucasian Isthmus, based on literature records and on author's personal observations is presented. The latter are confined almost entirely to the territory of the Azerbaijan Republic. (*Abstracter's note*: The faunistic list is incomplete, since only a part of the literature was consulted).

- (256) KIAUTA, B., 1972. Notes on new or little known dragonfly karyotypes. II. Male germ cell chromosomes of four East Mediterranean species, *Lestes barbarus* (Fabricius), *Calopteryx splendens amasina* Bartenev (Zygoptera: Lestidae, Calopterygidae), *Caliaeschna microstigma* (Schneider) and *Orthetrum taeniolatum* (Schneider) (Anisoptera: Aeshnidae, Libellulidae). Genen Phaenen 15 (2-3): 95-98 — (*Inst. Genet., Univ. Utrecht, Opaalweg 20, Utrecht, NL*). Spermatogonial and (or) spermatocyte chromosomes of *L. barbarus* (Belgrade, Yugoslavia; 2n = 25, n = 13), *C. splendens amasina* (Demirtas, Turkey; n = 13), *C. microstigma* (Samos, Greece; n = 7), and *O. taeniolatum* (Rhodos, Greece; 2n = 25, n = 13) are described and illustrated (micrographs, 1250x). A pair (bivalent) of m-chromosomes is present in all of them. *L. barbarus* is peculiar for the large size of one pair (bivalent). The reduced chromosome

number and neo-XY sex determination in *C. microstigma* are due to simultaneous fusion of most elements of the primary karyotype. In *O. taeniolatum* precocious segregation of the m-bivalent and the presence of an additional autosome fragment are often observed. (Author).

- (257) KIAUTA, B. & J.W. BOYES, 1972. Cytology of ten South American Libellulidae, with cytophylogenetic considerations on the genera *Orthemis* Hagen and *Erythrodiplax* Brauer (Odonata, Anisoptera). *Genetica* 43 (3): 407-421, pl. I. — (*Inst. Genet., Univ. Utrecht, Opaalweg 20, Utrecht, NL*).

Notes on karyotypic morphology are given for ten South American Libellulidae that were either cytologically little known or not studied previously, viz. *Dasythemis venosa* (Burm.) (Brasil, n = 13), *Orthemis ferruginea* (Fab.) (Peru, n = 12), *Micrathyria laevigata* Calv. (Brasil, n = 13), *Erythrodiplax cleopatra* Ris (Peru, n = 13), *E. connata connata* (Burm.) Chile, n = 12), *E. media* Borror (Brasil, n = 11), *E. melanorubra* Borror (Venezuela, n = 13), *Dythemis velox* Hag. (Peru, n = 13), *Macrothemis declivata* Calv. (Brasil, n = 12) and *M. imitans imitans* Karsch (Brasil, n = 13). A pair (bivalent) of m-chromosomes is present in all spp. *Orthemis* is the only genus in the family with n = 12 or a derivative of it in all species. This number is considered primary rather than secondary. As seen from pronounced variations in cytogenetic structure of its members, the genus appears genetically unstable, while the low recombination indices in all spp. may serve a need for biological stability. The cytophylogenetic history of the connata group of *Erythrodiplax* is discussed. (Authors).

- (258) KRUYT, W., 1972. Beste libel. Libelle (Haarlem) 1972 (18): 4. (Dutch). — (*Leeghwaterstraat 12, Haarlem, NL*).

A "Letter to the Editor", drawing attention to the correct spelling of the Dutch word for "dragonfly", which is "libel" and not "libelle" as used in the title of the article listed in OA No. 196.

- (259) KRYLOVA, V.N., 1972. Vertikal'nye predely rasprostraneniya strekoz v Tjan'-Shane. (Vertical zonation in the dragonfly distribution in Tien Shen). In: *Entomologicheskie issledovaniya v Kirgizii*, pp. 20-25. Ilim, Frunze, (Russian). — (*Inst. Biol., Acad. Sci. Kirghiz SSR, Ul. 22nd-Party-Congress 265, 720040 Frunze, Kirghiz SSR, USSR*).

The distribution of the Tien-Shan odon. fauna (56 spp., 13 geographical districts, 4 vertical zones) is tabulated. While the mediterranean spp. prevail in the valleys, members of the "invasional" fauna are predominant in the subalpine region. The upper distributional limit approximates the elevation of 3000 m, though no larval stages were observed there. Single *Aeshna* specimens were recorded up to the 3500 m mark.

- (260) KUMAR, A., 1972. The life history of *Lestes praemrosa* Selys (Odonata: Lestidae). *Treubia* 28 (1): 3-20. — (*Forest Ent. Branch, Forest Res. Inst., Dehra Dun, U.P., India*).

The breeding record of the univoltine monsoon sp., *L. praemrosa*, as obtained in the field (Dehra Dun, Uttar Pradesh, India) and in the laboratory, is presented and all immature stages are described and illustrated in detail. Notes on ecology and behaviour are added. Eggs are laid endophytically and in tandem at the beginning of the monsoon (July), larval development (15 instars) is completed by September-October when, towards the decline of the monsoon, emergence takes place. After a while the newly emerged and sexually immature insects leave the ponds (that dry up in the winter) and spend the dry season elsewhere. By the approach of the monsoon (June) they return to the breeding sites to mate and oviposit. The fact is stressed that, contrary to the situation in the temperate zone spp., in tropical representatives of the genus the adult stage lasts much longer than the immature stages.

- (261) KUMAR, A., 1972. Bionomics of *Orthetrum pruinatum neglectum* (Rambur) (Odonata: Libellulidae). *Bull. Ent.* 11 (1): 85-93. — (*Forest Ent. Branch, Forest Res. Inst., Dehra Dun, U.P., India*).

There are 10 instars in O. p.n. of Dehra Dun, India. Eggs collected in the field were reared in the laboratory. Hatching commenced after about 3 weeks, the total duration of instars 2 to emergence amounted to 155 days. Eggs and the 10 instars are described and illustrated in detail, and the development of antennae and structural changes in the course of larval life are tabulated. Notes on habitat, behaviour and phenology are added.

- (262) LIEFKES, F., 1972. (Art. Nouveau). Furniture and woodwork. Bull. Rijksmus. Amsterdam 20 (1): 6-21, 71-72. (Dutch, with Engl. s.) — (c/o Rijksmuseum, Hobbemastraat 21, Amsterdam, NL).

This issue of the journal is a catalogue of the Art Nouveau exhibition in the Rijksmuseum of Amsterdam. Item No. 17 is a glass showcase of various European and exotic timbers, decorated with a frieze of 5 woodcut dragonflies. The piece was made about 1900 by F. Gallé (Nancy, France).

- (263) MIELEWCZYK, S., 1972. On the food of the red-backed shrike, *Lanius collurio* L., near Gniezno (prov. of Poznań). Acta ornithol., Warsz. 10 (6): 115-131. — (Inst. Zool., P.A.N., ul. Swierczewskiego 19, Poznań, PO).

Observations were carried out from 1961 through 1964. The quantitative and qualitative composition of animals spiked by *Lanius collurio* does not fully reflect the state of the macrofauna observed in the field. Thus, in spite of the frequent occurrence of *Lestes* spp. in the area, none were found spiked. However, they were eaten by the bird, as the remains of 2 specimens were found in pellets.

- (264) MIELEWCZYK, S., 1972. Die Libellen (Odonata) der Umgebung von Gniezno. Fragm. faun. 18 (8): 141-162. (Polish, with Russian and German s.). — (Inst. Zool., P.A.N., ul. Swierczewskiego 19, Poznań, PO).

The paper reports on the results of faunistic and ecological studies carried out in the surroundings of the town of Gniezno, Poznań

prov., Poland, from 1967 through 1969, and is based on 3513 larvae, 367 exuviae and 7657 adults referable to 50 spp. In addition, a historical review of odonatology of the Great Polish-Kujavish plain is traced from 1885 to the present and general geographic features of the area are briefly outlined. *Coenagrion armatum* is new to the fauna of the plain. *Ischnura pumilio* is suggested to be semivoltine in the area. *Coenagrion lunulatum* is not restricted to peat bogs nor to marshes, and is very common in the moraine territory around Gniezno. This distributional pattern is in agreement with the suggestion of the existence of a relation between pleistocene glaciation and the present distribution of this sp., as put forward by Erich Schmidt (1954. Dt. Ent. Ztg., N.F., 1: 33-37). The composition of odon. faunas of some types of water bodies in the surroundings of Gniezno is analyzed.

- (265) MILL, P.J., 1972. Respiration in the invertebrates. MacMillan Press, Basingstoke. 212 pp. — (Dept. Zool., Univ. Leeds, LS2 9JT, UK).

The book provides an account of the whole field of invertebrate respiration. With respect to Odon. it includes a brief mention of the type of gills found in the zygoteran and anisopterian larvae, gives details of the branchial apparatus of aeshnid larvae, and accounts of the mechanics and neural control of ventilation, and of spiracular movements. (Author).

- (266) MILL, P.J. & R.S. PICKARD, 1972. Anal valve movement and normal ventilation in aeshnid dragonfly larvae. J. Exp. Biol. 56: 537-543, pl. I. — (Dept. Zool., Univ. Leeds, Leeds LS2 9JT, UK).

Anal valve movement and abdominal sternal movement of the larvae of *Anax imperator* were photographed with a ciné camera during normal ventilation to obtain a correlation between the two parameters. As the sterna are raised (expiration) the anal valve opens to about one third of its maximum. At peak sternal movement the anal valve opens fully and these events mark the transi-

tion between expiration and inspiration. The anal valve finally closes towards the end of inspiration. The narrow aperture of the anal valve during expiration, coupled with the increase in pressure in the branchial chamber, causes the expired water to be forced well clear of the anus. Conversely, the wide aperture during inspiration and the small negative pressure in the branchial chamber ensure that water is drawn in from close to the animal, and so there is minimal mixing of expired water with inspired. The relationships between water flow, anal valve movement, branchial chamber pressure, sternal movement, pleural strain, and activity in certain expiratory and inspiratory muscles are discussed. (Authors).

- (267) MIYAKAWA, K., 1972. Notes on the Odonata from the Yokote basin, North-east Japan. *New Entomol.* 21 (1): 15-17. (Japanese, with Engl. s.). — (*Imafuku 1024, Kawagoe, 356, JA*).

33 spp. are recorded for the first time from the Yokote Basin, Akita Pref., Japan. *Sympetrum maculatum* Oguma may be the first record from Akita Pref., and also the northernmost record in Japan. Other noteworthy spp. are *Planaeschna milnei*, *Boyeria maclachlani*, *Gynacantha japonica*, *Anisogomphus maacki*, *Rhyothemis fuliginosa*, *Epophthalmia elegans* and *Lestes japonica*. (Author).

- (268) MIYAKAWA, K., K. NARUMI, A. SHIMIZU & H. ANDO, 1972. Odonata of Sugadaira and vicinity. *Bull. Sugadaira Biol. Lab.* 5: 1-18. (Japanese, with Engl. s.). — (*Imafuku 1024, Kawagoe, 356, JA*).

Faunistic record and ecological notes on Odon. occurring in Sugadaira Heights (alt. 1300 m approx.), Nagano Pref., Japan, in surrounding lowland areas and in the Sampogamine Swamp (1860 m) are presented. The odon. fauna of this district is composed of 58 spp., of which 33 are northern or alpine, 24 are southern or cosmopolitan. The distributionally restricted spp. may be *Somatochlora viridiaenea viridiaenea* and *Coenagrion lanceolatum* of Sugadaira Heights,

Leucorrhinia dubia orientalis of Sampogamine Swamp, *Tanypteryx pryeri* of Seni at the foot of Sugadaira Heights and *Aeshna juncea* of both Sugadaira and Sampogamine. Their larval habitats are described briefly and observations on the reproductive and territorial behaviour of *S. viridiaenea* and on reproductive behaviour of *Libellula quadrimaculata asahinai* are reported. The habitat selection of *Sympetrum frequens* is discussed and a hypothetic life cycle is proposed in relation to the seasonal migration of the adults. A similar distributional pattern of *S. infuscatum* in highland wetland areas was observed, though the latter is less strongly migrant than the former. 25% of the eggs of *Lestes sponsa* from Swampogamine Swamp have been damaged by parasitic Hymenoptera.

- (269) MOENS, J., 1972. Studie van de ionenregulatie, de osmoregulatie en de waterbalans bij de larve van *Aeschna cyanea* Müll., met vergelijkende gegevens voor de larve van *Anax imperator* Leach (Odonata, Anisoptera). (A study of ion regulation, osmoregulation and water balance in the larva of *Aeschna cyanea* Müll., with comparable data on *Anax imperator* Leach [Odonata, Anisoptera]). Thesis, Univ. Leuven VI + 100 pp. (Dutch, with Engl. s.). — (*Bierbeekstraat 111, B-3040 Korbek-lo*).

In the larva of *A. cyanea* the Na^+ and Cl^- ions and free amino acids account for nearly 80% of the total osmotic pressure of the haemolymph. Starvation up to 10 days does not exercise any influence on the osmotic pressure. In hypertonic media, e.g. diluted sea water, the total salt concentration and total osmotic pressure exhibit a rapid initial increase, but after 80 hours they appear stabilized at a fixed level. In hypertonic media the increase of the Na^+ and Cl^- concentration is proportional to the concentration in the surrounding medium; the internal Cl^- concentration remains somewhat lower and that of Na^+ slightly higher than in the medium. Due to the decrease of the concentration of free amino acids the increase of the total osmotic pressure is relatively small. The

system and regulation of water balance were studied in both spp. by analysis of the variation in body weight and blood volume under different experimental conditions. The larvae do not drink while in tap water. If the ion concentration of the surrounding medium increases, the larvae compensate for the water loss by drinking and their body weight increases. Measurements of blood volume indicate that the increase in weight is due to the increase of the haemolymph volume by water absorption through the alimentary canal. The latter is probably responsible for the decrease in concentration of free amino acids in the insects in hypertonic media.

- (270) MOLS, E.J.P.J., 1972. The macrofauna of the "Ooypolder". Meded. Hydrob. Ver. Amsterdam 6 (2): 100-112. (Dutch, with Engl. s.). — (*Postelstraat 3, 's-Hertogenbosch, NL*).

In the course of a hydrobiological evaluation of the polder "Ooypolder" nr. Nijmegen, Netherlands, a qualitative and quantitative study has been carried out of the macroinvertebrate samples, collected by means of a landing-net. In all, larvae of 6 odon. spp. were represented at 4 out of 14 sampling localities. Save for *Ischnura elegans* all of these appear peculiar to the waters behind the dike.

- (271) MORITA, M., 1972. (A record of *Soma-tochlora clavata* from the southern part of Hyogo Pref.). Gekkan Mushi 10: 36. (Japanese). — (*43-19 Nakajima benzaimae, Iho-cho, Takasago-shi, Hyogo Pref., JA*).

A note on a ♂ taken at Shikata-machi, Innan-gun, Japan, on Sept. 15, 1971.

- (272) MORITA, M., 1972. (Five dragonfly species from Kakogawa-shi.). Gekkan Mushi 11: 37. (Japanese). — (*43-19 Nakajima benzaimae, Iho-cho, Takasago-shi, Hyogo Pref., JA*).

A list of local records.

- (273) MOUZE, M., 1972. Croissance et métamorphose de l'appareil visuel des Aeschnidae (Odonata). Int. J. Insect. Morphol. Embryol. 1 (2): 181-200. — (*Lab. Biol. anim., SN 3, Univ. Sci. Techn. Lille-I, B.P. 36, F-59 Vil-*

leneuve d'Ascq).

The post-embryonic growth of the odon. visual apparatus has been studied at all stages from hatching to ecdysis. During the larval life, the eyes and optic lobes show minor modifications in their structure. They grow by addition of new units which issue from 2 principal generative regions: the budding zone of the eye and the outer growing zone of the optic lobe. Both these formations migrate progressively and simultaneously to the dorsal face and then degenerate during the ultimate larval stage. The metamorphosis of the eye results from the differentiation of the ommatidia, which are formed during the last larval stages. This phenomenon goes with the particular processes of the cuticle which are necessary for the considerable increase of the imaginal eye. The greatest transformations of the optic lobe are located in the first optic ganglion, whose structure is completely modified. (Author).

- (274) MOUZE, M., 1972. Effet d'un mimétique de l'hormone juvénile, l'ester méthylique du farnésol, sur la métamorphose oculaire de la larve d'*Aeschna cyanea* Müll. (Insecte Odonate). Gen. Comp. Endocrinol. 18 (3): 127. — (*Lab. Biol. anim., SN 3, Univ. Sci. Techn. Lille-I, B.P. 36, F-59 Villeneuve d'Ascq*).

Effects of a analogue of juvenile hormone, the methyl ester of farnesol (EMF), on eye metamorphosis in larvae of *A. cyanea* were studied. A series of adultoids, presenting eyes and optic lobes that were intermediary between those of larvae and adults, was obtained by injection of EMF into ultimate instar larvae (US). The organs attain a more advanced stage of metamorphosis as the amount of EMF is smaller and as the injection is made at a later moment. Only by administering a very high dose immediately after the last molt can supernumerary larval instars be obtained. Injections administered later than the 6th day have no effect on metamorphosis (duration of US 25 days). Histological studies show that the eye and its growth zone, the external growth zone of the optic lobe, and the ganglionic lamella in

adultoids have the same structure as in control larvae sacrificed at different stages of metamorphosis. This suggests that the presence of the juvenile hormone analogue momentarily slows down the metamorphosis of the eye, which restarts after a while owing to a decrease in hormone level, caused by inactivation of the EMF. At the subsequent moult, induced precociously by the prothoracotropic effect of the EMF, the metamorphosis of the eye thus remains incomplete. (Translation of the original text).

- (275) NARAOKA, H., 1972. Notes on the dragonflies of the Satsuma Peninsula, Kagoshima Pref. New Entomol. 21 (1): 7-13. (Jap. with Engl. s.). — (*Murakami Apt., 252 Shinjohiraoka, Aomori-shi, Aomori Pref., JA*). During 1970-1971, 58 spp. were taken in the Satsuma Peninsula, Kagoshima Pref., Japan. Brief notes on *Mnais strigata*, *Trithemis aurora* and *Liriothemis elegantissima* are added.
- (276) NARAOKA, H., 1972. (Records of the Odonata of Kushiro area, Hokkaido). Bull. Kushiro Mus. 216: 26-29. (Japanese). — (*Murakami Apt., 252 Shinjohiraoka, Aomori-shi, Aomori Pref., JA*). In the period June to November, 1971 the author collected 35 spp. of which 3 are new records for the area (Japan).
- (277) NEAL, T.M. & W.H. WHITCOMB, 1972. Odonata in the Florida soybean agroecosystem. Fla Ent. 55 (2): 107-114. — (*Dept. Ent. and Nematol., Univ. Florida, Gainesville, Florida 32601, USA*). 35 spp. of 3 zygopteran and 4 anisopteran families were observed in soybean fields of Florida, USA. Where possible, time of flight, flight pattern, feeding habits and prey taken were recorded. 9 spp. appeared to be numerous enough and sufficiently selective in feeding habits to be capable of affecting prey populations, 3 of these possibly may affect prey of economic importance, viz. *Erythemis simplicicollis* (*Heliothis zea*, H. virescens, *Pseudoplusia includens*), *Pachydiplax longipennis* (*Solenopsis saevissima richteri*, *Epilachna varivestis*), and *Perithemis tenera* seminole (dolichopodid flies). Only 1 zygopteran, *Anomalagrion hastatum*, was consistently associated with soybean culture.
- (278) OHNO, M., 1972. (Review of the records of *Tramea virginia* in Tokyo and its surroundings). Nature and Insects 7 (7): 28-29. (Japanese). — (224 *Ashiori, Tsurugashima-machi, Iruma-gun, Saitama Pref., JA*). A review of the hitherto published records of *T. virginia* in the Tokyo area, Japan is given. The sp. was discovered in Tokyo by M. Kato in 1933. Since then 7 further observations were brought on record.
- (279) PICKARD, R.S. & P.J. MILL, 1972. Ventilatory muscle activity in intact preparations of aeshnid dragonfly larvae. J. Exp. Biol. 56: 527-536, pl. I. — (*Dept. Zool., Univ. College, P.O.B. 78, Cardiff, CF1 1XL, UK*). The expiratory role of the segmental, respiratory dorso-ventral muscles, and the inspiratory role of the subintestinal muscle, have been confirmed using intact preparations of larvae of *Anax imperator*. The strain developed by individual respiratory dorso-ventral muscles has been measured. The respiratory dorso-ventral muscles all cease firing simultaneously, about 100 msec before the sterna are fully raised, and do not have any mechanical effect on the sterna after this time. It is suggested that the delay is caused either because the role of these muscles is to lift the sterna past some critical position, and/or because of the inertia of the expiratory current. Periodically the sterna are raised and then lowered slowly in a series of steps, each pause in the lowering coinciding with activity in the respiratory dorso-ventral muscles. This form of ventilation is compared with others previously described. In normal ventilation, and in other types of ventilation, activity in the respiratory dorso-ventral muscles shows a pronounced tendency to begin in the most posterior segments and to continue for longer periods in those segments. Some aspects of the central neural connexions involved in normal ventilation are discussed. (Authors).

- (280) PINHEY, E., 1972. A new species of Chlorocyphidae (Odonata) from Liberia. *Arnoldia* (Rhodesia) 5 (28): 1-3. — (*National Mus., P.O.B. 240, Bulawayo, Rhodesia*). *Chlorocypha sharpae* sp. n., ♂ from Mt. Coffee, Liberia is described and illustrated. The type and 2 paratypes are in the Smithsonian Institution, the third paratype is in the collection of the National Mus., Bulawayo. The ♀ is unknown.
- (281) SCHMIDT, E., 1972. Das Naturschutzgebiet Teufelsbruch in Berlin-Spandau. IX. Die Odonatenfauna des Teufelbruches und anderer Berliner Moore. Sber. naturf. Freunde Berl., N.F., 12 (1-2): 106-131. — (*Biol. Seminar, Pädagogische Hochschule, Mürwikerstr. 77, D-239 Flensburg, GFR*). The odon. fauna (41 spp.) of 4 mesotrophic forest bogs in West Berlin was studied. Two of these (Teufelsbruch and the Grosse Fenn) dry up in summer, therefore their fauna is poor. The dominating spp. are *Lestes dryas* and *Sympetrum flaveolum*, characteristic though not abundant are also *Somatochlora flavomaculata*, *Leucorrhinia pectoralis* and *L. rubicunda*. The Barssee and Pechsee serve as water reservoirs for the town of Berlin, therefore their water levels fluctuate greatly, promoting in this way the swamp succession. The Pechsee fauna is rich in spp. characteristic of eutrophic environments; peculiar are *Sympetma fusca*, *Leucorrhinia albifrons* and *L. caudalis*. The Barssee, on the other hand, often dries up nearly completely, consequently its fauna became poor, resembling that of the seasonally dried up bogs. The usual chemical data for the four basins studied are added and the faunal composition and its changes are analyzed.
- (282) SENDA Y., 1972. (A case of an abnormal development of pterostigma in *Mortonagron Hirosei*). *Nature and Insects* 7 (5): 35. (Japanese). — (143 *Iisukita, Minamitsuda, Kimosawa-machi, Kimosawa-gun, Iwate Pref., JA.*). The pterostigma of the left forewing is unusually long and has an additional vein. (Cf. *OA* No. 223).
- (283) SPECTRUM DIEREN ENCYCLOPEDIE, 1972. Waterjuffer. (Damselfly). *Spectrum Dieren Encyclopedie* 7 (100): 2392-2395. (Dutch). — (*Podium N.V., P.O. Box 23, De Meern, NL*). An account on damselflies (Zygoptera), by an anonymous author, in a Dutch popular zoological encyclopedia. The text is accompanied by several colour and black-and-white photographs of European Calopterygidae and Coenagrionidae.
- (284) STARK, W., 1972. Beitrag zur Kenntnis der Libellenfauna der Steiermark. *Z. ArbGem. öst. Ent.* 23 (3): 86-95. — (*Goethestrasse 28, A-8010 Graz*). New distributional records, mostly accompanied by annotations on morphology and ecology, are given for 22 spp. from Styria, Austria. Special attention is paid to the vertical distribution of single spp. and earlier literature records on the subject are discussed. New spp. for the Styrian fauna are: *Erythromma viridulum*, *Aeshna subarctica* interlineata (cf. also *OA* No. 123), *Anax parthenope* and *Sympetrum fonscolombei*. For *Somatochlora arctica* the usual measurements are stated. The Styrian specimens of this sp. are similar in size to material from Tirol, but deviate from the European average.
- (285) TAURA, N., 1972. (The emergence of *Rhipidolestes aculeata aculeata*). *Gekkan Mushi* 13: 22-24. (Japanese). — (1029 *Shiro-moto-cho, Hitoyoshi-shi, Kumamoto Pref., JA*). The emergence is classified under the "up-right type" of Eda's classification.
- (286) VARMA, L., 1972. The morphology of the stomodeal nervous system in the adult dragon-flies, *Bradinopyga geminata* and *Orthetrum chrysis* (Libellulidae). *Acta Zool. Stockholm* 53: 9-16. — (*Post-Grad. Dept. Zool., Univ. Nigpur, Nigpur, India*). The morphology of the stomodeal system of adult *B. geminata* and *O. chrysis* is described. No gastric ganglion or ganglion ingluviale is present. Instead, the oesopha-

geal nerve forks near the junction of the proventriculus and the midgut. The 2 nerves run on either side of the midline as ingluvial nerves and enter the proventricular ganglionic masses. The latter are connected by a transverse nerve, termed the 'nervus transversus proventriculare'. Both bipolar and multipolar types of sensory cells are present on the surface of the crop. The cell-bodies appear to be interconnected by connective tissue. Dendrites from the cells terminate on the longitudinal muscle fibres surrounding the proventriculus and the midgut. The proximal processes of the cells enter the proventricular ganglionic mass. In methylene-blue-stained whole mounts the cells resemble stretch-receptors, and they probably play some role in the peristaltic movement of the gut. The corpora cardiaca lie dorsal to the pharynx and are connected to the brain by 2 pairs of nerves, the NCC I and II. Unlike in other insect spp., the nerve connecting the corpora cardiaca with the corpora allata is slender and arises as a branch of the NCA II. The corpora allata are spherical to ovoid in shape and lie ventral to the nerve-cord. Anteriorly they are attached to the inner

wall of the hypopharynx, while posteriorly they connect to the suboesophagean ganglion by the paired NCA II.

- (287) VERBEEK, J., 1972. (Art Nouveau). Silver. Bull. Rijksmus. Amsterdam 20 (1): 22-28, 72. (Dutch, with Engl. s.). — (c/o *Rijksmuseum, Hobbemastraat 21, Amsterdam NL*).

This issue of the journal is a catalogue of the Art Nouveau exhibition in the Rijksmuseum of Amsterdam. Item No. 27a is a golden handle of a walking stick, decorated by a pearl and a garland of diamonds and sapphires; in the central field an iris and a dragonfly are figured. It was produced by Messrs. van den Ersten & Hofmeyer (Amsterdam), and was used until 1913.

- (288) WATANABE, K., 1972. (Records of four odonate species from Hokkaido). Gekkan Mushi 16: 24-25. (Japanese). — (3-10-2 *Tsubaki-mori, Chiba-shi, Chiba Pref., JA*). *Nehalennia speciosa*, *Ischnura asiatica*, *Planaeschna milnei* and *Anax parthenope julius* collected between 1969 and 1971 at various localities at Hokkaido, Japan are listed.

ERRATA

The half tone in some figures of the paper, J. BELLE, *On Diaphlebia Selys, 1854 from Central America (Odonata: Gomphidae)*, published in the second issue, pp. 63-71, unfortunately did not turn out satisfactorily. These are reproduced below.

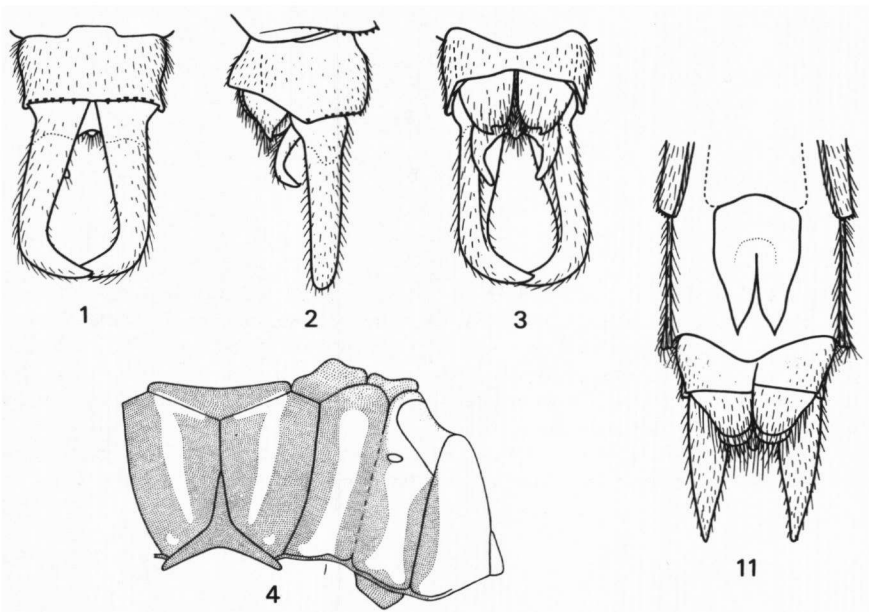


Fig. A

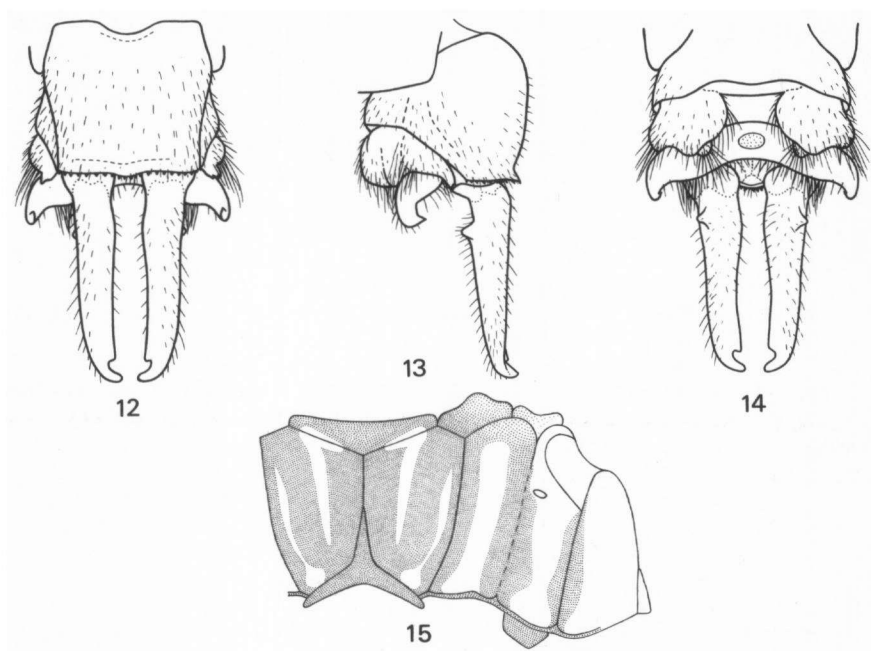


Fig. B

ODONATOLOGICAL ABSTRACTS. No. 45 (*Klötzli*) should read as follows: "It was demonstrated, in a small population of *C. virgo* from the surroundings of Berne, Switzerland, that the frequency of territory change varies in different life periods. Thus, it is high at the beginning of territory formation, it decreases thereafter, and increases again during the last period. In the areas with low population density the territorial steadiness is relatively high already at the beginning. (Author)".

No. 121 (*Spuris*). Material was collected in Southern Lithuania and not in Latvia as stated erroneously in the English translation of the title and in the text of the abstract.