

**AN OUTLINE OF THE HISTORY OF ODONATOLOGY IN
SWITZERLAND, WITH AN ANNOTATED BIBLIOGRAPHY ON THE
SWISS ODONATE FAUNA***

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After stressing the mixt British-Swiss character of T. Moufet's *Insectorum theatrum* of 1634, the author traces the development of odonatology in Switzerland from 1680 to present. Brief references are also made to contributions of Swiss odonatologists to the knowledge of the fauna of other regions and to odonatology in general, and to those of non-Swiss workers to the knowledge of the Swiss fauna. The annotated bibliography (1680-1978, partim) contains 184 titles related to the fauna of the Swiss territory. In addition, portraits and 1 other photograph of 15 Swiss workers are reproduced (4 of which are original) along with samples of some previously unpublished archival material related to the history of Swiss odonatology.

PREFACE AND INTRODUCTORY NOTES

Through an invitation of the Committee for Scientific Research in the [Swiss] National Park, in 1969, I became involved in various research projects in the Engadine, including the inventarization of the odonate fauna of this region of the Eastern Alps. While examining the older museum material and searching for the literature records, I became aware of the fact that Switzerland is one of the very few European countries still lacking a modern monograph, a faunistic catalogue, or even an up-to-date checklist of its odonate fauna. It also soon became

* Dedicated to the 120th anniversary of the Swiss Entomological Society.

apparent that a great deal of Swiss material pertaining to this order and deposited in various domestic and foreign museums, particularly also in Senckenberg and in the British Museum (Nat. Hist.), has never been worked out and brought on record. The same is true of the unusually rich and often highly interesting faunistic and historic archive material, deposited in various local institutions. This situation has initiated the idea to try to collect all that is known on the Swiss odonate fauna – with the intention that the material gathered, combined with recent faunistic surveys, would serve as a basis for a later monograph.

Various duties elsewhere have prevented an early realization of this project. What is more, a new generation of odonatologists has appeared in Switzerland, from whose published work it became abundantly clear that they will be in a much better position than I could ever hope to be to cover the scope of the work and to bring the project to an adequate and early conclusion. This is all the more welcome in view of the Swiss participation in the European Invertebrate Survey scheme.

In the meantime, I have practically concluded the bibliographic part of the original project. I have intended to present the gathered historic material at the Sixth International Symposium of Odonatology, planned to be held, in 1981, in Switzerland. The circumstances, however, make the location of the Symposium in that country still uncertain. It was for this reason, among others, that I was happy with the invitation, received from the Migros Company in Bern, to deliver an address on behalf of the International Odonatological Society at the opening of the recent exhibition of dragonfly photographs of Mr. O.R. Strub and Ms. I.E. Siegenthaler in the Swiss capital, on May 17, 1978. The invitation has provided the opportunity to give a brief review of the history of Swiss odonatology, and the below text represents an enlarged and modified English version of the original tape-recorded German talk. The subdivision into chapters is rather formal and has been introduced here for the sake of convenience rather than as an indication of historical periods, the delimitation of which is, in most cases, very difficult.

The history of odonatology is a discipline in itself and the objective of the present paper is to give a general impression of the rich material available rather than to narrate every detail and to evaluate the contribution of every worker. The paper, thus, should be understood as a general review of the field and not as a lexical account of the subject. It goes without saying that the achievements of many workers are important enough to form the subject of detailed critical studies. The aim of the present review lies solely in pointing out the points of particular interest.

The scope of the essay is limited to reviewing the faunistic achievements related to the fauna of the Swiss territory and only brief references are made to other than local faunistic publications of Swiss workers. Included, however, is an account of the contributions on the Swiss dragonfly fauna by non-Swiss

odonatologists and collectors.

The appended bibliography forms an essential part of the paper. Within the above defined scope it is hoped to be almost complete, though I was unable to examine some of the older works, and I have certainly overlooked some papers that have appeared in less well known local periodicals and probably many in which dragonflies are not the main subject.

Finally I should like to stress that I would be unable to collect the material presented here, if it were not for the continuous and essential help and assistance of my wife, Marianne, who has accompanied me on all of the numerous, though always brief visits to archives, libraries and museums, in Switzerland and elsewhere.

REVIEW OF THE SWISS ODONATOLOGICAL ACHIEVEMENTS

PRELINNAEAN PERIOD

The early history of Swiss entomology began with the acknowledged "Father of Swiss natural history", Dr. CONRAD GESSNER (1516-1565) of Zürich and is, through him, interwoven with the early origins of British entomology.

Gessner was actively interested in various aspects of entomology though, during his lifetime, he did not publish on insects. In the framework of his large zoological compendium, however, he planned a volume on insects which, unfortunately, has never appeared. Nevertheless, some of Gessner's entomological notes were published posthumously in his ophidiological work (1587), prepared for publication by Dr. Hans Casper Wolf (1532-1601) who, after the author's early death from pestilence, has been taking care of Gessner's scientific materials. Dr. Wolf passed on Gessner's entomological manuscript to Dr. Joachim Camerius (1534-1598) of Nürnberg, who (?) has sold it to the British naturalist and entomologist Thomas Penn (= Penny) (deceased 1589). The latter planned to publish the manuscript along with the entomological notes from the inheritance of the zoologist Eduard Wotton (1492-1555) of Oxford, but his death prevented the realization. The manuscript material has then been bought by Dr. THOMAS MOUFET (1533-1599 or 1604) of London, who has essentially supplemented the text and added more than 150 new wood-engravings to the approximately 350 original illustrations. After Moufet's death, the completed manuscript, probably by last will, came into the possession of Dr. THÉODORE TURQUET DE MAYERNE baron D'AUBONNE (1573-1655) of Geneva, physician of Charles I, who finally published it in London (1634), under Moufet's name and under the title, *Insectorum sive minimorum animalium theatrum, olim ab Edoardo Wottono, Conrado Gesnero, Thomaque Pennio inchoatum; tandem Tho. Moufeti Londinatis opera sumptibusque maximis concinnatum, auctum, perfectum: et ad vivum expressis iconibus supra quingentis illustratum.*

English editions have appeared in 1636 and 1658. It seems likely that an earlier (incomplete?) edition has been published "in an imperfect manner by Scholzius, 1598" (cf. H.A. Hagen, 1862, *Bibliotheca entomologica*, p. 554. Engelmann, Leipzig).

Moufet's work, thus, is the first British entomological publication; but it is Swiss to a considerable extent. The text, however, is uniform, hence it is not clear which part of the book is based on Gessner's manuscript and pertains originally to Swiss material.

HISTORIA
NATURALIS
HELVETIÆ
CURIOSA,

*In VII. Sectiones com-
pendiosè digesta.*

Authore

JOH. JACOBO WAGNERO,
Mcd. Doct.



TIGURINI

Impensis

Joh. Henrici Lindinneri, Bibliopeg.
M. DC. LXXX.

Fig. 1. Facsimile of the title page of Johann Jacob Wagner's *Historia* of 1680, probably containing the earliest reference to Swiss odonate fauna.

Moufet's book contains a rough classification of dragonflies, dividing them into *maxima*, *media* and *minima*, corresponding approximately to Aeshnidae, Libellulidae, and the Zygoptera. From his low-quality figures *Libellula depressa* and *Calopteryx virgo* can be recognized.

The dawn of Swiss odonatology lies in the baroque. Probably the first information ever published on Swiss dragonflies is that given by JOHANN JACOB WAGNER (1641-1695), physician in Zürich, in his book, *Historia naturalis Helvetiae curiosa*, published in 1680. This is a pocket-size volume, divided into seven "articles", the sixth of which deals with animals, incl. the insects, (mainly) of the Zürich region. In his (German written) History of the prelinnaean entomology (1928, 1929), F.S. Bodenheimer classified the work as a typical "Heimat-Büchlein". Although written in Latin, it has no scientific pretensions, it is not illustrated, but the insect stories are well readable and give a good general impression of what was known on the entomology in the Zürich circles of Wagner's time. The dragonfly larvae are referred to as *Eruclia aquatica*, and their vernacular names, "Rückling" or "Rückle", are also mentioned. The

verbatim text, on p. 240, runs: "In fundo Lacus Tigurini [= Zürich Lake] haec reperitur, nullis thecis includitur, in escam piscium & anatum cedit: tempore aestivo in speciem Perlarum (Augenschiesser) minimarum convertitur et ex reptili volucris evadit".

In the prelinnaean technical literature the dragonflies are called "perlae", a name introduced in entomological literature by Ulysses Aldrovandi (1522-1605) in his famous, *De animalibus insectis libri septem*, of 1602. Interesting is also the reference to reptiles in connection with the larval stage. In the prelinnaean literature larval dragonflies were often associated with reptiles. Wagner's contemporary, John Jonston (1603-1675), in his *Historia naturalis de insectis libri III* of 1653, called them *lacertae aquaticae* – to give just a single example, since this and the book by Moufet described above are the only entomological references listed by Wagner.

Of considerable interest is the book of HANS ERHARD ESCHER (1656-

Beschreibung Des Zürich Sees:

Wie auch

Von Erbauung / Zuzammen/
Stand und Wesen loblicher Statt Zürich:
von der Lust- und Nutzbarkeit des Sees: von
vielen Thieren / so sich in und um denselbigen befin-
den: Was sich freudiges und trauriges
darauf zugetragen:

Von den Stätten / Schöffereyen / Fläken /
Dörferen und Höfen / so an und um disen See ges-
legen: Von Gelehrten / Kunstreichen und Wol-
gerüsteten Männern / so um disen See
gewohnet:

Auch von diser anwohnenden Völckeren Heer-
zügen / Schlachten / Bündnissen / und anderen
Denkwürdigen Begebenheiten.

Samt einem kömlichen Land- und See-Läfeltein.

Aufgesetzt von J. C. Escher

Hans Erhard Escher.

Getrukt zu Zürich/
Bey Joh. Rudolf Simler / 1692.

1689), descendant of an ancient noble family from Kaiserstuhl, printed posthumously (1692) under the title, *Beschreibung des Zürich Sees*. This is a work of a 17th century "topographer" rather than of a naturalist, but the author was a good observer, and from his descriptions of the larval and adult stages, corduliids and gomphids can be roughly recognized. Though brief, his field observations are certainly not less accurate than those of his great contemporaries, Antony van Leeuwenhoek (1632-1723) and Leonhard Baldner (1612-1694).

Escher is dwelling at some length on the local dragonfly folk names. The Zürichers of the 17th century called the larval dragonflies "Rickli", "Rückle" or "Rückling", as mentioned also by Wagner, while the adults were "Fliegende Rückling" and "Augenschiesser". The latter name is explained by Escher as being due to the dragonflies' large eyes, and to their rapid flight, changing direction again and again (indicated by the German verb "schies- sen").

Fig. 2. Facsimile of the title page of Hans Erhard Escher's "topography" of the Zürich Lake region of 1692, containing a rather detailed account on the local dragonflies, but hitherto overlooked by entomological historians.

The book is sparsely illustrated, but no illustration is given of a dragonfly. Since it is written in German, it must have reached wider circles of readers than Wagner's work, and it is surprising that it has escaped the notice of all entomological historians and bibliographers of early entomological literature.

EARLY POSTLINNAEAN WORKERS

After publication of (the tenth edition of) the Linnaean *Systema naturae* (1758), Swiss entomologists were among the first to follow into the steps of the great master. The *Kennzeichen der Insecten*, published in 1761 by the Winterthur physician JOHANN HEINRICH SULZER (1735-1813), can be favourably compared with better known achievements of the early postlinnaean epoch. In contrast to the monumental regional monographs of this time, the most splendid example of which is perhaps *Entomologia carniolica* (1763) of Ioannes Antonius Scopoli (1723-1788), Sulzer's work is a brief, general, world-wide account of arthropods, dwelling on higher categories rather than on the species level. The "conservative" style shows strong influence of the prelinnaean works, but the author was a keen observer, hence, unlike most entomological works of his time, the book contains accurate observations on dragonfly mating and oviposition behaviour, life history and longevity, though only two species are mentioned and figured in beautiful, hand-coloured copper engravings.

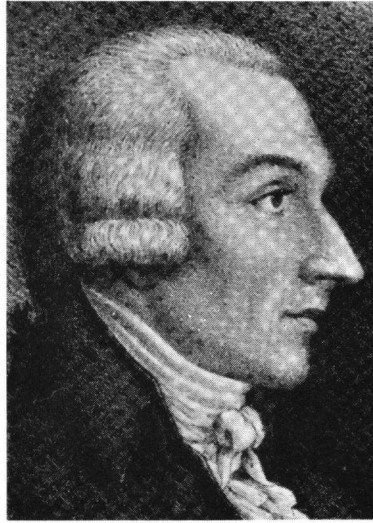
Most, if not all of the latter, including the dragonfly plate, were contributed (and are signed) by the miniature painter and entomologist, JOHANN RUDOLPH SCHELLENBERG (1740-1806) of Winterthur (born in Basel), who supplied many high quality insect illustrations also for Fuessly and Roemer (cf. below), and who himself anonymously and in addition to a few other minor works, published two outstanding volumes (1798-1806) under the title, *Helvetische Entomologie oder Verzeichniss der schweizer Insecten, nach einer neuen Methode geordnet mit Beschreibungen und Abbildungen* (Orell & Fuessly, Zürich; Vol. I: IV + 149 pp., 16 pls; Vol. II: XLIII + 247 + I pp., 32 pls.), which work was translated simultaneously into French by the Frenchman JOSEPH PHILIPPE DE CLAIRVILLE (1742-1830) of Winterthur.

While in Winterthur Sulzer was working on his second, much larger volume, his friend, JOHANN CASPER FUESSLY (1743-1786), bookdealer, publisher

SOURCES OF THE PORTRAITS on pp. 197, 204, 209; J.C. Fuessly: FUESSLIN, 1775 (frontispiece); - J.G. Amstein: G. BENER-LORENZ, 1937, *Ehrentafel bündnerischer Naturforscher*, Naturf. Ges. Graubündens, Chur; - J.D. Labram: *Verh. naturf. Ges. Basel* 19 (1908); - R.L. Meyer-Dür: *Mitt. schweiz. ent. Ges.* 7 (1885); - E. Killias: BENER-LORENZ, 1937; - G. Schoch: *Ins. Börse* 16 (1899); - G.H.T. Eimer: *Ins. Börse* 15 (1898); - C. Tarnuzzer: BENER-LORENZ, 1937; - F. Ris: *Ent. News* 42 (1931); - A. Portmann: original; - O.R. Strub: original; - I.E. Siegenthaler: original.



J.C. Fuessly (1743-1786)



J.G. Amstein (1744-1794)



J.D. Labram (1785-1852)



R.L. Meyer-Dür (1812-1885)

and entomologist in Zürich, in 1775 published his *Verzeichnis* of Swiss insects. This is the first annotated list of the insect fauna of Switzerland, containing 1175 insect species and 50 other arthropods. Eleven dragonfly species are from Bern, the surroundings of Zürich and from canton Grisons. The material of the latter had been supplied by Dr. JOHANN GEORG AMSTEIN (= AM STEIN), "The Older" (1744-1794), physician in Marschlins and Zizers.

In the preface of his book, Fuessly announced publication of the forthcoming volume by SULZER, *Abgekürzte Geschichte der Insecten* (1776). This is a large, world-wide systematic treatment of arthropods, classified into seven "classes". The dragonflies, along with Ephemeroptera, Trichoptera, Plecoptera, Neuroptera and Mecoptera, fall into the fourth "class". The book is of considerable odonatological importance, since it includes hand-coloured illustrations of two previously unknown species, viz. *Libellula* (= *Pyrrhosoma*) *nymphula* from Zürich and *L.* (= *Sympetrum*) *danae* from the Lac de Joux in canton Vaud. These are the only dragonfly species the types of which have been described (figured, in this case) from Switzerland, though odonatologists for a long time remained unaware of this work, and only in 1954 was the priority of Sulzer's *Sympetrum danae* over *S. scoticum* Donovan, 1811 established by the Committee on Generic Nomenclature of the Royal Entomological Society of London (cf. LONGFIELD, 1954). Important comments on and additions to Sulzer's book were published by J.C. FUESSLY in his *Magazin für die Liebhaber der Entomologie* (1778). As far as Sulzer's two new Swiss dragonfly species are concerned, Fuessly added a few descriptive notes and synonymized "*Libellula nymphula*" with Scopoli's fifth "variation" of "*Libellula puella*".

In his classical monograph on the natural history of the Geneva region (four volumes, 1779-1796), the geologist and professor of philosophy and natural history HORATIUS BENEDICTUS DE SAUSSURE (1740-1799) of Geneva, listed but a single dragonfly species. It is "*Libellula rubra*" (= *Sympetrum flavolum*), which is stated to be rare in the surroundings of Geneva.

As the last major Swiss work of the 18th century, reference should be made to the *Genera insectorum*, published in 1789 by Dr. JOHANN JACOB ROEMER (1761-1819) of Zürich. This is one of the few Swiss publications of odonatological interest written in Latin. It lists six odonate species, including Sulzer's two new taxa, which, however, are erroneously synonymized with Fabrician species. Most dragonfly illustrations are reproduced from Sulzer's *Abgekürzte Geschichte*.

A well-informed worker was the Russian Count GEORG DE RAZOUMOWSKY (born in the 1740-s in Russia, deceased in 1837 in Moravia), the only important 18th century foreign worker on Swiss entomology. In the same year as Roemer's work, de Razoumowsky's regional monograph, *Histoire naturelle du Jorat et de ses environs et celle des trois lacs de Neufchâtel, Morat en Bienne*, appeared in Lausanne. In the exhaustive faunistic catalogue he listed five odo-

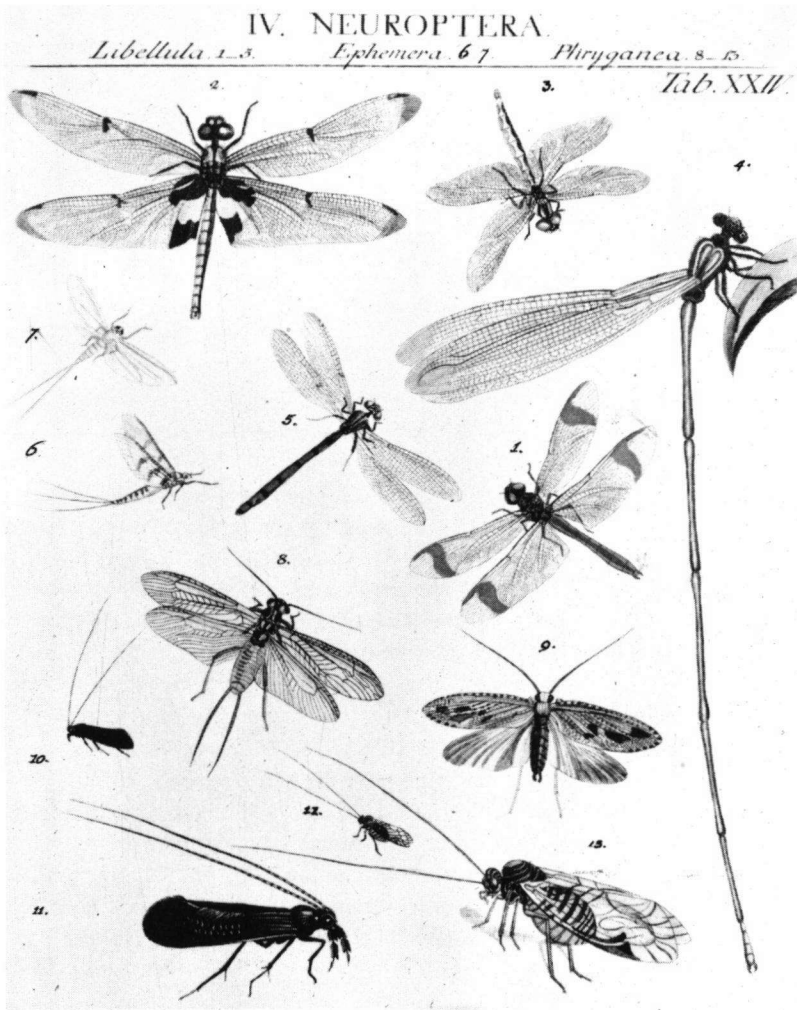


Fig. 3. Facsimile of dragonfly plate of Johann Heinrich Sulzer's *Abgekürzte Geschichte der Insecten* of 1776. On the basis of hand-coloured illustrations No. 3 and 5 the priority of Sulzer's names *Libellula* (= *Sympetrum*) *danae* (from the "Valley of the Lac de Joux") and *L.* (= *Pyrhosoma*) *nymphula* (from "Zürich") has been established. The other three species illustrated are: No. 1: *Sympetrum pedemontanum* (Allioni, 1766) (from "Grisons"), - No. 2: *Rhyothemis phyllis* (from "India"); this is the third odonate species credited to Sulzer on the basis of the illustration reproduced here, and - No. 4: *Mecistogaster lucretia* (Drury, 1773). After Drew Drury (*Illustrations of natural history* [. . .], White, London, Vol. 2, p. 97, pl. 48, fig. 1) Sulzer is repeating the original erroneous statement as to the provenience of this neotropical pseudostigmatide ("Cape of Good Hope").

nate species, along with brief Latin diagnoses, contemporary literature citations, French annotations, and with French vernacular names.

A brief reference should be made here to the Rev. LUCIUS POOL (= POL) (1754-1828) of Malix, parish-priest, later Dean, and a prolific botanist, entomologist and topographer. In the field of entomology he (privately) published a single slim volume that does not contain any odonatological information. STECK (1926) listed three of his manuscripts, all dated in the 1790-s. They are said to be deposited in the Staatsarchiv (?) in Chur, but we were unable to trace them there. One of these, bearing the title *Enumeratio insectorum Rhetiae indigenorum*, represents probably the first checklist of the insect fauna of Rhetia (= canton Grisons), and would certainly be worthy of closer examination, if it could be located.

EARLY NINETEENTH CENTURY AND THE PERIOD OF R. MEYER-DÜR AND HIS CONTEMPORARIES

Among the first publications of the new century, and certainly of more than general interest, is the exhaustive account on the alpine insect fauna (1807) by CARL ULYSSES VON SALIS (1760-1818) of Marschlins, a pupil of Dr. J.G. Amstein "The Older" (cf. above). The monograph includes an odonate list from the Chamonix area (France) and gives a detailed account of observations of huge numbers of (not identified) dragonflies, noticed on the snows of Breithorn.

In the December 1818 issue of his *Naturwissenschaftlicher Anzeiger der allgemeinen schweizerischen Gesellschaft für die gesammten Naturwissenschaften* KARL FRIEDRICH AUGUST MEISNER (1765-1825), professor of natural history in Bern, published an incidental note on a migration of an unidentified dragonfly species, observed in June of the same year in the surroundings of Murten, canton Bern. He appealed to the readers to notify him on any further details they might have observed of this phenomenon, but has apparently received no response and the note remained unnoticed by subsequent reviewers of the dragonfly migration records. After C.U. von Salis's note, Meisner's article represents the first record of a dragonfly migration in the 19th century, and is, again after von Salis, the first record from the Swiss territory.

The first notable major work of this period, *Symbola faunae insectorum Helvetiae*, published in 1822 by the young, gifted Basler, Jacob Johann Hagenbach (1802-1825), conservator of the insect collection in the Museum of Leyden, Holland, and son of the well-known author of *Flora Basels*, K. Friedrich Hagenbach, contains no odonatological information, but it is of importance as the first entomological work illustrated by the famous artist JONAS DAVID LABRAM (1785-1852). The latter, in cooperation with the later President of the Swiss Entomological Society, hymenopterologist, orthopterologist and coleopterologist Dr. LUDWIG IMHOFF (1801-1868) of Bern, published six

volumes (1836-1845?, the last incomplete and without date) under the title, *Insecten der Schweiz*. The work is a continuation of Hagenbach's *Symbola* and, in the second volume (1838), it contains three dragonfly species. Dr. Imhoff was a fellow-student and, later, collaborator of Prof. Louis Jean Rudolphe Agassiz (1807-1873) of Orbe, and his name is associated with most of the Swiss entomological activities towards the mid of the 19th century. His large collection, combining all Swiss insect orders with the types of the species described by him as new, was bought by Prof. Agassiz for the Museum of Comparative Zoology, Cambridge, Mass., United States. A second general collection has been deposited in the then Public Museum of Basel.



Fig. 4. Dr. Ludwig Imhoff (1801-1868)
(Reproduced from *Mitt. schweiz. ent. Ges.* 31; 1958).

Major JOHANN RUDOLPH AM-STEIN (= AM STEIN) (1777-1862) of Malans, son of the above mentioned collaborator of Fuessly, Johann Georg, was among the founders of the Grisons' Natural History Society (*Naturforschende Gesellschaft Graubündens*) (1845), and a meticulous collector of Grisons molluscs and insects. He published extensively on the first group, while his insect manuscripts remained unpublished and are deposited in the State Archives of Grisons in Chur. Among these are extensive abstracts and transcripts of the contemporary odonatological literature, and a detailed list of his odonate collection, with species descriptions, locality data and illustrations. This manuscript has

been probably written in the early 1840-s and would certainly deserve a detailed study and publication.

A somewhat unexpected source of faunistic information, usually not consulted by odonatologists, is the locally well-known series, *Historisch-geographisch-statistisches Gemälde der Schweiz. Hand- und Hausbuch für Kantonsbürger und Reisende*, published by Huber in St. Gallen and Bern. The present author was unable to trace all the issues, but 19 parts seem to have appeared between 1835 and 1858, each devoted to a different canton. Most of the (often rather voluminous) books contain a section on the local insect fauna, and the latter usually includes brief references to Odonata, though lists of species (or at least genera) are given only for the cantons Schwyz (G. MEYER VON KNONAU, 1835), Basel (L.A. BURCHARDT, 1841), Glarus (O. HEER & J.J. BLUMER-

dragonflies, of Oeningen (1848, *Mitt. naturf. Ges. Zürich* 1: 52-54; – 1849, *Die Insektenfauna von Tertiärgebilde von Oeningen und von Radoboj in Croatien*, Bd. 2, Engelmann, Leipzig). His book, *Die Urwelt der Schweiz* (1865; revised edition 1879; both Schulthess, Zürich), remains the classical reading on the fossil insects of Switzerland.

His contemporary was FRANÇOIS JULES PICTET DE LA RIVE (1809-1872), professor of zoology and comparative anatomy at the University of Geneva, a well-known trichopterologist and the describer of *Macromia splendens* (from France). In the Natural History Museum of Geneva there is some odonate material labeled with Pictet's name, but the identity of the collector is not clear, since there are three other workers of the same name that have been active in Geneva during approximately the same period, viz. A. EDOARD PICTET (1835-1879), ALPHONSE PICTET (born in 1838) and Dr. ARNOLD PICTET (1869-1948). The first of these, son of François Jules, made an entomological trip to Spain (1859) in the company of R.L. Meyer-Dür.



Fig. 6. Prof. Oswald Heer (1809-1883). (Reproduced from *Mitt. schweiz. ent. Ges.* 31; 1958).

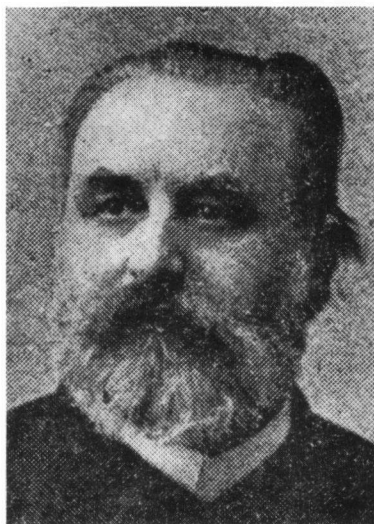
Specialized odonatology began in Switzerland with RUDOLPH LUDWIG MEYER-DÜR (1812-1885), merchant and more or less professional insect dealer in Burgdorf and Zürich. He was one of the founders of the Swiss Entomological Society (1858), and one of the most gifted and prominent Swiss entomologists of the 19th century. His general knowledge was nearly encyclopedic, and his work on "Neuroptera", Orthoptera and Hymenoptera in more than one respect represents a milestone in Swiss entomology. Of Meyer-Dür's over 40 published papers (for almost complete bibliography cf. W. Rytz, 1959, *Burgdorfer Jahrbuch*, pp. 56-92, 1 tab., 2 pls. excl.), at least seven are dealing partly or entirely with the Swiss Odonate fauna. His 1846 account of the odonate fauna of the surroundings of his native town of Burgdorf is the first Swiss odonatological publica-

tion. His *Neuropteren-Fauna der Schweiz* (1874-1875) includes the first monographic treatment of the 60 Swiss dragonfly species known at that time.

One of Meyer-Dür's early associates was the well-known hymenopterologist Dr. EMIL FREY-GESSNER (1826-1917) of Aarau, later curator of the Geneva Museum d'Histoire naturelle, where some of his odonate material is deposited.



E. Killias (1829-1891)



G. Schoch (1833-1899)



G.T.H. Eimer (1843-1898)



C. Tarnuzzer (1860-1925)

Meyer-Dür earned part of his living by trading in insect collections and by rendering identification services to amateur collectors. One of his prominent odonatological clients was Dr. EDUARD KILLIAS (1829-1891) of Chur (= Coire), physician in Tarasp (Engadine) and for 34 years the President of the Naturforschende Gesellschaft of Grisons. Dr. Killias was a diligent amateur botanist and entomologist and published extensively on the flora and on some insect orders of his native canton. His dragonfly collection has been partly identified by Meyer-Dür, and is deposited in the Natural History Museum of Chur, along with his unpublished manuscript *Neuroptera rätica*, in which all published and unpublished information on the odonate fauna of Grisons is brought together.

During his years in Zürich, Meyer-Dür spent much of his time in the Entomology Museum of the Polytechnic Institute, headed from 1876 by Dr. GUSTAV SCHOCH (1833-1899), entomologist of broad interests, and author of a number of odonatological publications, among which the first key for identification of Swiss dragonflies (1878).

The illustrious neuropterologist and famous odonatologist Dr. AUGUST HERMAN(N) HAGEN (1817-1883) of Königsberg, later professor of entomology at Harvard University, published a few notes on the Swiss odonate fauna in his doctoral dissertation, submitted to the University of Königsberg (1840), and which is the first purely odonatological doctorate thesis ever written. Of interest is also his 1865 list of the dragonflies of the Zürich region, based on the manuscript catalogue of and on the specimens received from the well-known Züricher entomologist JOHANN JACOB BREMI-WOLF (1791-1857).

A lonely worker was GOTTFRIED LUDWIG

*Insectes Neuropteres de Suisse
rédigé par ou pour être disponibles chez
Meyer Dür, Entomologiste à Zurich.
(16 Scheffelstrasse 16)*

	Fr. ca.		Fr. ca.
Psocidae		Orthotrum aculeatus L	50
<i>Psocus longicornis</i> L	- 15	<i>humatum</i> Latr.	- 50
<i>notatus</i> Steph.	- 15	<i>caeruleatum</i> L	- 50
<i>janatus</i> f.	- 20	<i>fulvum</i> Adl.	1 -
<i>immaculatus</i> Steph.	- 10	Cordulia <i>venax</i> L	- 60
<i>signatus</i> Latr.	- 15	<i>uliginosa</i> de Scl.	5 -
<i>ovatus</i> L.	- 10	<i>metellus</i> = 2 L.	1 50
<i>flavipes</i> Steph.	- 10	<i>lividus</i> Latr.	2 50
<i>nitens</i> Latr.	- 20	<i>Spithamea bimaculata</i> G.	3 -
<i>phaeopterus</i> Steph.	- 15	<i>Gomphus locustinus</i> L.	- 60
Odonata (L. bellulus)		<i>uliginosus</i> P.	- 60
<i>Limnolibinia pectoralis</i> G.	- 50	<i>pubescens</i> L.	2 -
<i>dubia</i> = 2 L.	1 -	<i>occidentalis</i> G.	2 -
<i>albifrons</i> Bonn.	2 50	Cordulegaster annulatus Dr.	1 50
<i>annulata</i> G.	2 50	<i>bidentatus</i> de Scl.	3 -
<i>Symphetrum atrolatum</i> G.	- 40	<i>Utax</i> <i>occidentalis</i> = 2 P. S.	2 50 15
(= <i>uliginosa</i> L.)		<i>fulvipes</i> de Scl.	4 - 16
<i>meridionale</i> de Scl.	70	Aeshna <i>ajacis</i> - Kl.	1 -
<i>flavipes</i> L.	60	<i>juncea</i> L.	2 50
<i>depressa</i> = 2 de Scl.	- 50	<i>grandis</i> L.	2 50
<i>puberulum</i> = Kl.	- 70	<i>versicolor</i> = 2 L.	4 -
<i>angustum</i> = Kl.	- 30	<i>fuscipes</i>	6 -
<i>occidentale</i> - Bonn.	- 30	<i>pratensis</i> - Kl.	2 -
Platetrum <i>depressum</i> L.	- 40	<i>maris</i> de	7 -
<i>libellula</i> = 2 maculata L.	- 40	<i>affinis</i> = 2 L.	2 50

Fig. 7. The Anisoptera page from the hand-written price catalogue of Rudolph Meyer-Dür, issued probably around 1880-1881. Original deposited in Dr. Eduard Killias's file in the Bündner Naturhistorisches und Nationalparkmuseum, Chur.

THEOBALD (1810-1869), an immigrant from Hessen, since 1854 the natural history teacher at the Canton School in Chur, an outstanding geologist and further the author of numerous publications in the fields of botany and topography. His general manuscript account on Neuroptera, deposited in the State Archives in Chur, contains a single odonatological note, which is interesting because of the correct spelling of the generic name *Aeshna*, but contains no faunistic information.

One of the most peculiar works of 19th century odonatology is the German *Systema entomologiae*, published privately in 1876 by HEINRICH BUCH-ECKER (1829-1894), conservator of the Museum of Strasbourg. This slim volume is characterized by greatly peculiar classification and nomenclature, and abounds with taxonomic errors, misinterpretations of observations and wrong statements. It gives, however, a considerable number of previously unrecorded dragonfly species from Zürich and elsewhere, though many of them are wrongly named and described as new. Buchecker's *Hydronympha helvetica* (= *Orthetrum cancelatum*), *Sympetrum tenerimum* (= *S. depressiusculum*), *Diplacodes nigrostigma* (= *S. sanguineum*), *D. flavostigma* (= *S. vulgatum*), all from Zürich, *Sympetrum rhäticum* (= *S. fonscolombei*) from Grisons, and *Coenotiata gonypenis* (= *Leucorrhinia dubia*) from the surroundings of St. Moritz, – to mention just the anisopterans, – have found their way even into Kirby's catalogue, though they were later synonymized by F. Ris (1909-1916).

More adequate incidental accounts of and contributions to the odonate faunas of various Swiss regions were published in the second half of the 19th century by G. DU PLESSIS (1868, Orbe), K.

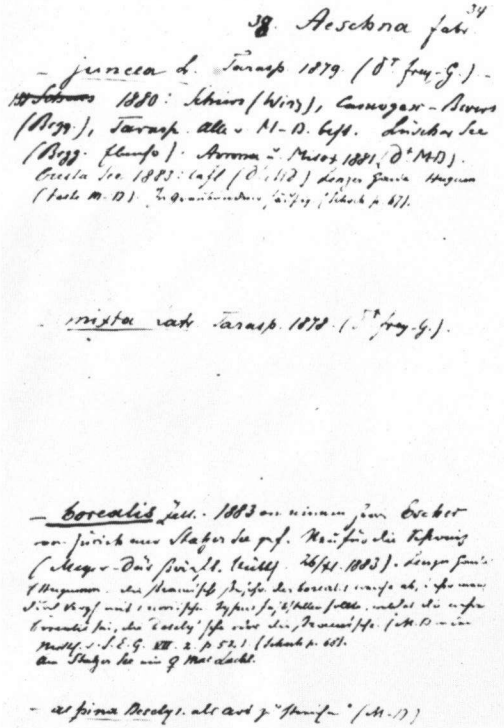


Fig. 8. Fascimile of a page from Dr. Eduard Killias's manuscript *Insecta rätica*. The original contains XVI + 196 pages, 32 of which are devoted to the catalogue of Odonata. It is deposited in the Bündner Naturhistorisches und Nationalparkmuseum, Chur.

DIETRICH (1871, Zürich and Valais), R. PIROTTA (1879, Tessin), E. LINIGER (1881, Bern; 1886, Valais), and E. MORY (1899, Joux Valley in canton Vaud). Dragonfly migratory flights were recorded by E.A. GÖLDLIN of Schaffhausen (1880, Berner Jura) and by G.T.H. EIMER of Stäfa, professor in Tübingen (1881-1882, Engadine).

In about the same period, frequent visits to the Continent brought the illustrious British trichopterologist, ROBERT McLACHLAN (1837-1904) to Switzerland several times. In August, 1880 he spent ten days in the Engadine and, at the Staatzer See near St. Moritz, collected *Aeshna coerulea* and *Somatochlora arctica*, then new to the Swiss fauna. In 1882 he brought together some 500-600 specimens of "Neuroptera" and Trichoptera in the canton Valais and in the vicinity of St. Gothard, and a part of the summer of 1898 he spent collecting in the Swiss Jura (Lac de Joux). As far as we could ascertain, McLachlan's 1882 material has never been published, save for a record of *Ischnura pumilio* from St. Gothard, given by W.J. LUCAS (1900).

ROBERT WYLIE LLOYD (1868-1959) of London published a note on the fauna of the surroundings of Zermatt (1899).

LATE NINETEENTH- AND EARLY TWENTIETH CENTURY: THE PERIOD OF F. RIS AND THE WORKERS BETWEEN THE TWO WORLD WARS

In January, 1886 appeared the odonate part of the *Fauna insectorum Helvetiae*, written by a young student of Medicine of the Zürich University, FRIEDRICH RIS (1867-1931). The author was not unknown among the Zürich entomologists, where, by his secondary school teacher, Dr. G. Schoch, he had been introduced into the "Entomologische Kränzchen", a small society of Zürich entomologists from the most varied walks of life. This monograph was the very first publication of the young author, and it was to remain the standard work on Swiss dragonflies until our days.

Ris's entering on the stage of odonatology has introduced an entirely new epoch. Due to his activities, Switzerland became one of the world odonatological centres for about four decades. Rheinau, where Dr. Ris was residing as the director of a huge hospital, became the Mekka of dragonfly workers, visited by such illustrious authorities as KENNETH JOHN MORTON in 1904, Dr. and Mrs. ROBIN JOHN TILLYARD in 1926, Dr. EDMUND M. WALKER in 1928, and Dr. and Mrs. PHILIP P. CALVERT in 1929 – to mention just a few of them.

Dr. Ris was among the greatest odonatologists of all times, and one of the very few whose work was devoted to dragonfly faunas of all regions. His fundamental monograph of the Libellulidae of the world (1909-1916; 1278 quarto pages, 692 text figures, 8 colour plates) placed him at an equal level with the acknowledged "Father of Odonatology", the Belgian baron Michael Edmond de Selys Longchamps (1813-1900), and remained by far the largest single

publication ever written on dragonflies. Apart from this work Ris published about 80 major papers and monographs of general odonatological contents and on the faunas of Europe, Central Asia, Persian Gulf, China, northern Africa, on the Ethiopian and Oriental regions, Malay Archipelago, Australasian area, on the Nearctic and on the Neotropics. It is unfortunate that his complete odonatological bibliography has never been published.

An evaluation of Dr. Ris's great and lasting contribution to the science of odonatology does not lie within the scope of this brief review. His contribution to the knowledge of Swiss dragonflies, contained in close to 30 papers, is based on systematically planned excursions that led him into all corners of the country. A minute record of these has been kept in his entomological diary, parts of which have been published posthumously by T. VOGELSANGER (1937-1945).

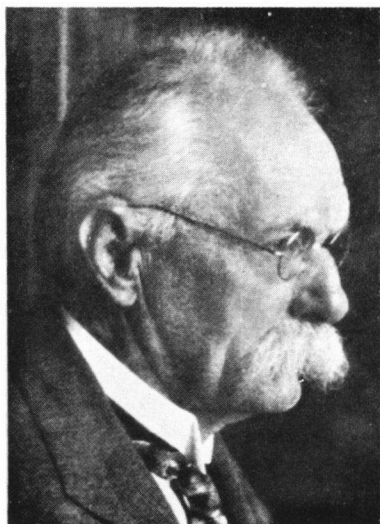
Dr. Ris's huge odonate collection, particularly valuable because of many types, along with his other odonatological material, manuscripts and correspondence, is deposited in the Senckenberg Museum, Frankfurt am Main. His diary (1917-1930), rich in odonatological notes, is kept in the archives of the Naturforschende Gesellschaft in Schaffhausen.

During the early years of the new century, among the most frequent foreign entomological visitors of Switzerland was the lepidopterologist Dr. THOMAS ALGERNON CHAPMAN (1842-1921) of Glasgow, qualified in the obituary published in the *Entomologist* as "one of the greatest and most scientific entomologists [Britain has] ever produced". He has collected dragonflies in the Engadine (1900, 1911), in Saas-Fee and Zermatt (1908) and in the Rhône Valley and Locarno (1913). His material was brought on record by R. McLachlan and later (1908, 1911, 1914) by another leading British odonatologist, WILLIAM JOHN LUCAS (1858-1932). The latter also published records collected incidentally in Luzern by G.T. LYLE (1923).

Only recently (cf. DUFOUR, 1978) some material has been published that had been brought together by CHARLES MAERKY (1856-1929) and deposited in the Museum d'Histoire naturelle of Geneva. It includes a specimen of *Lestes macrostigma* from Tessin – the only one yet known of this species from the Swiss territory.

Apart from Ris, Swiss workers of the early decades of the 20th century have contributed incidental though often important odonatological records. Among these are a note on *Boyeria irene* by O. KLEIBER (1912), and a series of articles on dragonfly migrations noticed in Chur, Lower Engadine, Prätigau and in the Berner Oberland, and published by Dr. CHRISTIAN TARNUZZER (1860-1925) from Schiers, poet, naturalist and geography teacher at the Canton School in Chur (1920, 1921, 1922), and by H. PRELL (1925).

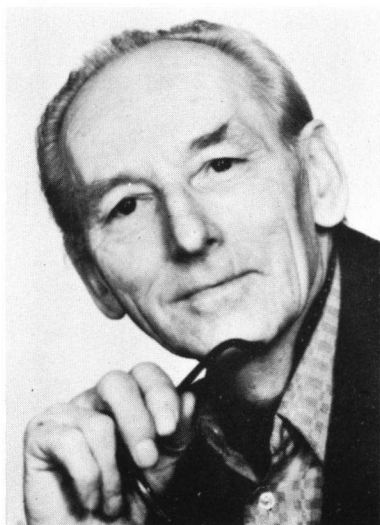
Most of the odonatological notes of this period, related to ecology and local distribution in various areas and in different biotopes, are incorporated in larger, complex treatises. An example is the classical monograph on the animal life of



F. Ris (1867-1931)



A. Portmann (1897-)



O.R. Strub (1905-)



I.E. Siegenthaler (1926-)

the alpine lakes by F. ZSCHOKKE (1900), followed, mostly under his influence, by such well-known workers as F. BAUMANN (1910), C. STEINER (1911), E. HANDSCHIN (1919), K. BORNHAUSER (1922), W. SCHMASSMANN (1924), F. STIRNIMANN (1926), D.C. GEIJSKES (1935) and others. Among these, Dr. Geijskes, a Dutchman who for this work obtained the PhD of the University of Basel, is the only specialized odonatologist. His promotor was Prof. ADOLF PORTMANN (born 1897) who, in his turn, had received his PhD at the same University under Prof. F. Zschokke, for a thesis on the "biological systematics" of the odonate fauna of the surroundings of Basel (1921). Although, until present, this remained Portmann's only (faunistic) odonatological work, it has greatly influenced European odonatologists for a number of decades.

Worth mentioning are the odonate collections of the hemipterologist and canonic Dr. NESTOR CERUTTI (1886-1940) of Chippis in Valais (later Sembrecher and Martigny), brought together between 1908 and 1940, and deposited in the Musée zoologique of Lausanne.

FROM WORLD WAR II TO PRESENT

During World War II a few important papers have appeared. With the publication of the fauna of the French-speaking regions (1941) Dr. JACQUES DE BEAUMONT has filled a serious gap in the knowledge of the dragonfly distribution in western parts of the country. Dr. ADOLF NADIG studied the micro-distribution and ecology of the larvae of a few alpine species inhabiting the Swiss National Park in Engadine (1942). Dr. EBERHARD STRAUB, finally, has produced a fine study on the odonate digestive tract during metamorphosis (1943).

The postwar period is characterized by a flush of papers. Among the numerous new authors, PAUL-ANDRÉ ROBERT (1901-1977) of Orvin in the Berner Jura is the only one who has commenced publishing before the War. His 1958 dragonfly book was certainly the greatest achievement of that time. The late Dr. Robert was a gifted and patient observer of dragonfly life, and above all, an unequalled artist whose dragonfly illustrations in this and other books became classical already during his lifetime. His ill health unfortunately prevented him from finding a publisher for the second volume, dealing

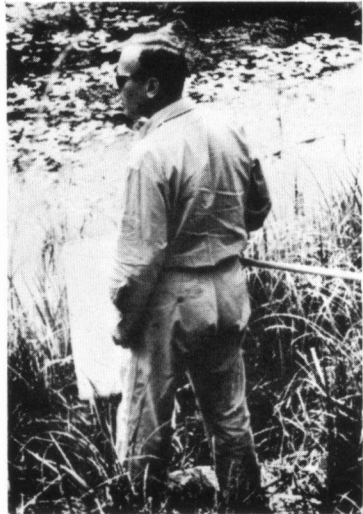


Fig. 9. Otto-Paul Wenger (1919-). (Original, dated summer, 1958).

with the larval stages of European species.

Robert's French text was translated into German by his friend, OTTO-PAUL WENGER of Bern, author of several papers on the fauna of his native canton (1955, 1956, 1967). Notes on the dragonflies of Prätigau and Bad Ragaz were produced by ARMIN WALKMEISTER. (1950, 1951), and on those of various localities in the surroundings of Zürich by Dr. WALTER HÖHN-OCHSNER (1948, 1966) and Dr. EDWIN MESSIKOMMER (1954).

The Fribourg Musée d'Histoire naturelle harbours some dragonfly material, collected in this canton between 1945 and 1950 by the Rev. Father ALBERT IHLE of Drogens, killed by robbers in Katanga, Central Africa, in the late 1950-s.

Two foreigners have made interesting contributions to the knowledge of Swiss dragonflies in this period. Dr. KJELL ANDER of Lund, Sweden, published the Swiss material of *Aeshna coerulea* and *Somatochlora alpestris* from Ris's collection in the Senckenberg Museum (1950). In the framework of a large project on insect migrations across the Bretolet Pass in the Valais Alps, carried out, under the direction of Dr. J. Aubert, by the Museum of Zoology of the University of Lausanne, Dr. HEINRICH KAISER of Bayreuth, German Federal Republic, published on the 1963 migrations (1964).

In the field of physiology and behaviour HANS and MAX RUSSENBERGER of Schaffhausen produced a thorough study on the anatomy, kinematics and dynamics of the flight apparatus in *Aeshna cyanea* (1963, *Mitt. naturf. Ges. Schaffhausen* 27: 1-88), ANNA MARIA [KELLER-] KLÖTZLI of Bern (now Kiesen) published on the territorial behaviour of *Calopteryx virgo* (1971), while Dr. ADRIANE S. ETIENNE of Geneva is working on aeshnid larval behaviour (1964-1977).

In his PhD thesis (1971), Dr. WILLY MATTHEY (Neuchâtel) dwelled on the ecology of some tyrphophilic species of the Brévine Valley in the Swiss Jura. His odonate material from Jura and the surroundings of Neuchâtel is deposited in the Department of Zoology of the University of Neuchâtel.

The present active generation, represented by ALBIN BISCHOF (Chur), JÜRIG DEMARMELS (= DE MARMELS) (Egg), CHRISTOPHE DUFOUR (Lausanne), HANS SCHIESS (Oberhittnau) and Dr. HANSRUEDI WILDERMUTH (Wetzikon), has brought to light, within a short space of time, numerous interesting observations and records, but some of the gathered material is still waiting to be written up.... Among the latter is an account on the fauna of Tessin, the field work on which has been completed 1977 by J. de Marmels and H. Schiess. Of the numerous publications reference should be made here only to the series on the fauna of Grisons (BISCHOF, 1971, 1973, 1976) and Schwyz (DE MARMELS, 1978), and to the monograph on the fauna of the so called "Romanic Switzerland" (DUFOUR, 1978). The latter term is used in French for the topographically and biogeographically heterogenous western part of the country; it is based on ethnic (French speaking population), not on administrative or topographic

grounds, and embraces the cantons Vaud, Fribourg (Freiburg) and Neuchâtel, and the French-speaking areas of cantons Bern and Valais (Wallis). Dufour's work has brought the number of species known to occur in Switzerland to 76.

Since 1976 much publicity has been given in various media, particularly also



Fig. 10. "*Einheimische Libellen und deren Entwicklung vom Ei zum Ei*" (= Our dragonflies and their development from egg to egg): a detail from the (fourth) exhibition of dragonfly photographs, shown under this title in the Migros Gallery, Bern (May 8 - June 29, 1978) by Otto R. Strub and Irene E. Siegenthaler. (Original).

in the local press, to the popular book *Das Libellenjahr* (= The dragonfly year), of OTTO ROBERT STRUB and IRENE ELISABETH SIEGENTHALER of Thun. The authors are professional photographers and film producers and have also organized so far four public exhibitions of dragonfly photographs (1976-1978), which have attracted much attention in wide circles of the general public and that of the local press, including various local dailies. It is hoped that their work will help to inspire the youngest generation's interest for dragonflies and their life.

BIBLIOGRAPHY OF THE SWISS ODONATE FAUNA

INTRODUCTORY NOTES

The first bibliographic list on the Odonata of Switzerland is that of STECK (1926), covering the literature published prior to 1900, and listing 46 titles. The provisional, also greatly incomplete bibliography of KIAUTA (1970) contained 110 titles, published up to the late 1970. In the below list annotations are given of 184 publications that have appeared between 1680 and early 1978. The list does not pretend to be complete, though the fraction of papers that have escaped the author's notice is hoped to be small.

In addition to the statement in the introductory section of this paper, the following types of publications are not included: (1) papers presumably or certainly based on Swiss material in which, however, the provenience of the latter is not explicitly stated, (2) general field guides and reviews, containing only general references to the Swiss fauna, (3) book reviews, except those containing critical or original notes concerning the Swiss fauna, (4) newspaper and other press

notes of contents as specified under (3), (5) obituaries of and other biographic articles on Swiss workers, (6) archiv material, even if readily available in public institutions, and (7) papers dealing with the Swiss fossil faunas.

For the biographic data reference is made to the *Historisch-biographisches Lexicon der Schweiz*, vols. 1-7, Suppl. (1921-1934; reprint 1978) and to BENER-LORENZ (1937; for the reference cf. p. 196, footnote). References to biographical literature, obituaries and (partly) to the published portraits are given in H.A. HAGEN, 1862, *Bibliotheca entomologica*, vols. 1-2, Engelmann, Leipzig (reprint 1960, Hafner, New York); – W. HORN & S. SCHENKLING, 1920-1929, *Index litteraturae entomologicae*, vols. 1-4, Horn, Berlin-Dahlem; – M. CARPENTER, 1945, *Am. Midl. Nat.* 33: 1-116; 50: 257-348; – W. DERKSEN & U. SCHEIDING, 1963-1975, *Index litteraturae entomologicae*, vols. 1-5, Dt. Akad. Landwirtwiss., Berlin; – and in P. GILBERT, 1977, *A compendium of biographical literature on deceased entomologists*, Brit. Mus. (Nat. Hist.), London.

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