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The history of natural research in the northern part of the Silesia-Cracow Upland between the middle of the 19th century and the end of the 20th century

THIS PAPER IS DIVIDED INTO THREE PARTS according to the periodization accepted by the majority of Polish science historians.

I

The first part of this paper is devoted to the presentation of the research conducted between the second half of the 19th century and the end of the First World War. It began in 1850s when a group of naturalists from Warsaw led by zoologist Antoni Waga and botanist Wojciech Jastrzębowski, conducted in 1854 a physiographic research of the Cracow-Częstochowa Jurassic Upland. Among the other members of the research team were Kazimierz Stronczyński (zoologist), Władysław Taczanowski (ornithologist) and Jan Wańkiewicz (entomologist). They travelled along a route stretching from Częstochowa through Olsztyn, Złoty Potok, Żarki and Pieskowa Skała to Ojców. They described their research journey in *A Report From a Journey of Naturalists to Ojców in 1854*. The Warsaw naturalists strongly emphasized the distinctive character of the Jurassic Upland and its unique nature.

Ferdynand Karo, a pharmacist and a botanist, in his work entitled *The Flora of the Częstochowa Region* published in 1881, described 778 species of vascular plants from the area of Częstochowa. This is the first fundamental botanical work relating to that region.

The bryological research in the northern part of the Cracow-Częstochowa Jurassic Upland was conducted by an eminent botanist, Franciszek Błoński, who distinguished 143 species of moss in the area of Częstochowa, Blachownia, Olsztyn, Janów and Złoty Potok (1889, 1890).

In the first years of the 20th century, the research work in the area of botany was taken up by several young scholars, whose careers peaked in the years of independent Poland. Among them was Zygmunt Wóycicki who in 1914 published *The Pictures of the Flora of the Polish Kingdom and the Neighbouring Countries* devoted to the flora of the Częstochowa and Olsztyn area.

In the area of zoology, the herpetological research was conducted by Antoni Walecki who in his *Materials for the Zoogeography of Poland* (1883) was the first person to register and notify the occurrence of the Aesculapius snake in the area of Częstochowa.

The ornithological research in the Częstochowa region was carried out by the world-famous scholar, Władysław Taczanowski. In 1888 he published *A Register of Birds of the Kingdom of Poland Observed Within the Last Fifty Years* in which he notes the occurrence of, among others, the rock thrush (*Monticola saxatilis*).

In 1908, in his work entitled *Beetles (Coleoptera) Collected in the Area of Częstochowa in the Kingdom of Poland in the Years 1899–1903*, Henryk Lgocki quotes a list of 2,217 species and varieties of beetles from that region.

The eminent Polish entomologist, Jan Prüffer was connected with Częstochowa as well. His first works were devoted to the butterflies of the Częstochowa region. He published detailed registers of them in 1914 and 1918 in his two works entitled *Materials Concerning the Fauna of Lepidoptera of the Częstochowa Area*. In the first one he names 429 species of butterflies, while in the second one, 114 species; 543 in total.

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Detailed information about dragonflies was collected as well: in his work *Die Tierwelt Polens* (1917) Ferdynand Pax identified 11 species of dragonflies in the area of Częstochowa, while Jan Prüffer in his *List of Dragonflies of the Częstochowa Region* (1918) identified 35 such species.

The first records of snails in the Częstochowa region come from around the same time as well. For these we are indebted to the work of an eminent malacologist and zoogeographer Władysław Poliński. In 1917 he published his great conchological monograph *Materials Concerning the Malacozoological Fauna of the Kingdom of Poland, Lithuania and Polesie* mentioning 28 species of snails from the area of Złoty Potok and Olsztyn.

Among the geologists of the first half of the 19th century, Jerzy Bogumił Pusch, the author of *Polens Paläontologie* (1837), the great work about fossils (also Jurassic ones from Jasna Góra in Częstochowa) has a significant place.

In 1885, in the work *The Jurassic Formation in Poland*, Aleksander Michalski described the nature of the range of Jurassic hills stretching from Częstochowa to Wieluń.

The Jurassic formations of Częstochowa were the subject of research of geologist, Gejza Bukowski as well, who in his monograph *Über die Jurabildungen in Czenstochau in Polen* (1887) called Jasna Góra a classic example of Lower Oxfordian.

Among the miners who contributed to the development of geology one must not fail to mention Stanisław Kontkiewicz senior, who in his work *The Geological Studies on the Jurassic Formation Between Częstochowa and Cracow* (1890) published the results of his studies of the south-western part of the Kingdom of Poland.

II

The second part of this paper is devoted to the natural studies conducted in the interwar and post-war periods. The period after the First World War was marked with a development of phytosociology and it was then its chief goal was established, which was the investigation of the structure and the mutual relations between plant societies as well as their classification. Botanist, Marian Sokołowski, undertook that pioneering task and in his work entitled *Sociological Research in a Beech Reservation in Złoty Potok on Wiercica* (1928) he described the plant societies in the “Parkowe” reservation in Złoty Potok.

As far as Częstochowa is concerned, in 1924 it was the area of work of Władysław Hyla, whose most important treatise entitled *The Monuments and Peculiarities of the Częstochowa District* (1938) was, among others, devoted to the flora of Częstochowa and its surroundings.

Another researcher of the period, Henryk Błaszczyk, contributed to our better familiarisation with the flora of the Częstochowa region. His botanical research concentrated on vascular plants and they were to become the main subject of one of his most important works *The Botanical Searches in the Częstochowa District* (1949). In it Błaszczyk describes 32 species of plants that have not, until then, been noted as occurring in that region, for example: *Aspidium lobatum*, *Larix polonica*, *Drosera longifolia*, *Potentilla recta*, *Achillea nobilis*, *Cirsium acaule*, *Rudbeckia lacinata*.

As far as the fauna of the Częstochowa Upland is concerned, the research relating to it was in the inter- and post-war periods fragmentary and focused on selected animal groups only.

The years 1914–1936 were a period of very active and systematic research in the field of fauna, conducted by Marian Masłowski and his brother Ludwik. They published the results of their work in a paper entitled *The Butterflies of the Zawiercie Area. Volumes I–III* (1928, 1929, 1936). They identified 657 species of larger (*Macrolepidoptera*) and 178 species of smaller (*Microlepidoptera*) butterflies.

The lepidopterological research in the inter-war period was conducted by the before mentioned Jan Prüffer. The result of that research was a paper entitled *An Attempt at Characterizing the Częstochowa Area on the Basis of the Analysis of the Distribution of Butterflies in the Cracow-Wieluń Jurassic Upland Range* (1934), in which the author publishes a list of 432 species of larger butterflies (*Macrolepidoptera*) encountered in that region.

The snail fauna of the Częstochowa area lived to see its own academic work *The Zoogeographical Significance of Polish Molluscs and the Necessity to Protect Groups of Them* (1928) by Władysław Poliński. In the post-war period the snails of our region were described by Jarosław Urbański. In his work *The Relict Molluscs of Poland and the Selected Adjoining Countries* (1948), he names the relict snails of the Cracow-Częstochowa Jurassic Upland, such as *Pupilla sterri* and *Vertigo alpestris*.

In 1946 Kazimierz Kowalski undertook the task of preparing a detailed inventory of the caves of the Cracow-Wieluń Upland; the result of his work is *The Polish Caves. The Caves of the Cracow-Wieluń Upland* published in 1951. He mentioned about 136 caves from Częstochowa Upland.

In the post-war period new geological centres were established, the most significant of which still is The Polish Geological Society, established in 1921 in Cracow.

One of its founders was Józef Premik, an eminent inter-war expert in the Jurassic era.

He attempted the geological interpretation of the Częstochowa area as well as at establishing its stratigraphy. The results of his research were published in a work entitled *The Structure and the Geological History of the Częstochowa Area* (1934).

In the period 1945–1946 Stanisław Kontkiewicz, jr. was a director of a Federation of Iron Ore Mines and Fluxes in Częstochowa. In one of his most important works entitled *The Częstochowa Ore-Bearing Area* (1949) he described the Jurassic brown ore-bearing layers of the region.

III

The third part of the paper is devoted to modern botanical, zoological and geological research. In modern times Polish botany ceased to limit its interests to describing and classifying the countless numbers of plants.

After almost 90 years, the bryological research in the northern part of the Jurassic Upland was resumed. In 1955 Bronisław Szafran published his work *The Mosses of the Cracow-Wieluń Jurassic Mountain Range with Consideration of Natural Reserves* featuring a systematic list of 141 species from the northern part of the Silesia-Cracow Upland.

In 1959 Marian Kuc in his work *The Mosses of the Northern Part of the Cracow-Częstochowa Jurassic Upland* describes 202 species of moss found in the area in question, including 67 new ones.

The 1960s have brought development in lichenological research. It was headed by Janusz Nowak, who was particularly interested in lichens (*Lichenes*). One of his most important works devoted to the lichens of the region in question is *The Lichens of the Cracow-Częstochowa Jurassic Upland* (1961) where he presents information about 114 species occurring in the northern part of the Upland. The flora and the lichen groups of the area between Częstochowa and Wieluń were the subject of J. Nowak's publication entitled *The Lichens of the Wieluń Upland* (1967); the author names 269 species of lichens found in that area. J. Nowak is also the author of the first new descriptions for the study of the lichens' taxons, among others *Amphoridium ionaspicarpum* from the Wieluń Upland and *Amphoridium impurum* from the Częstochowa Upland.

The extremely successful development of the botanical and the phytosociological research in the northern part of the Silesia-Cracow Upland in 1970s is the result of the activities of a number of eminent botanists from the Łódź University: Janusz Hereźniak, Halina Krasowska and Maria Ławrynowicz. They published *The Flora of the Warta Gorge in Częstochowa* (1970) and *The Flora of the Warta Gorge near Częstochowa* (1973) where they characterise the plant societies occurring on those territories and list 550 species of vascular plants and 96 species of Bryophyta.

After 50 years the phytosociological research in the "Parkowe" reservation was resumed by Florian Celiński and Stanisław Wika, who summarised the results in the article *A new look at phytosociological conditions in the Parkowe reservation in Złoty Potok near Częstochowa* (1978).

From 1965 onwards Janusz Hereźniak has been conducting systematic botanical and phytosociological research in the northern part of the Silesia-Cracow Upland.

One of his more important works is *The Extinction of Flora in the Częstochowa Area as a Result of a Hundred Years of Urbanisation* (1976), where the author analyses the extent and the reasons of the flora extinction in the region.

In 1983 in his article entitled *The Distribution of Twisted-stalk (*Streptopus amplexifolius* (L.) Dc.) in Poland* he names 5 new localities for that species in the Częstochowa area.

In his subsequent work entitled *New localities of rare and interesting vascular plant species in the northern part of the Silesia-Cracow Upland* (1983) Hereźniak presents a list of 153 species of vascular plants of botanical interest and rare for the area in question, including 47 species identified for the first time.

The subsequent large treatise of the same author *The variability and changes of forest vegetation in the northern part of the Silesia-Cracow Uplands* (1993), concerns the forest communities of the

area in question. J. Hereźniak outlines the changes to the natural environment, performs the botanical analysis and characterises the plant societies and communities occurring there.

The mycological research conducted in the Częstochowa Upland by Maria Ławrynowicz resulted in the discovery of underground fungi, including the black truffle *Tuber mesentericum*. She describes the localities of that species in her article *Tuber mesentericum, an interesting species of black truffles in Poland* (1999).

The Wieluń Upland had not been a subject of complex botanical research until the 1980s.

The flora stock-taking in that area was taken up by the academics from Łódź University; in 1986 Lucyna Fagasiewicz, Krystyna Czyżewska and Romuald Olaczek published *Flora of vascular plants on the Załęcze Nature Park Area*, containing a list of 768 species of vascular plants.

The bryological investigation of the area of the Wieluń Upland has been performed by Ewa Filipiak, who in her article *The flora of Mosses on the Załęcze Nature Park Area* (1986) mentioned 99 species of mosses which originate from that area.

The article by Krystyna Czyżewska devoted to the lichen flora *Terrestrial Lichen Flora on the Załęcze Nature Park Area* (1986) contains a list and specifies the distribution of 83 lichen taxons.

The modern times mark also the development in the zoological sciences, such as teriology, paleozoology, ornithology, herpetology, entomology as well as research on the underground fauna in the area of interest to us.

Teriology, which has become one of the leading sciences in the world, is the area of research of the Institute of Systematics and Evolution of Animals PAS in Cracow directed by Kazimierz Kowalski. In 1953 he published *Material relating to the distribution and ecology of cave bats in Poland*, where he names 6 bat species inhabiting the caves in Sokole Góry near Częstochowa.

The bat fauna of the Częstochowa Upland was also investigated by Wincenty Harmata, who in his article *News posts of the bat Myotis emarginatus Geoffrey in Southern Poland* (1958) co-written with Józef Trzaska, describes the new localities of that species in the Jaskinia Koralowa (the Coral Cave) and Jaskinia Olsztyńska (the Olsztyn Cave) near Częstochowa. The status of bat research in the winter period in several larger caves of the Cracow-Częstochowa Upland, including the Jaskinia Koralowa, has been presented by W. Harmata in his work entitled *Observations of Bats (Chiroptera) in the Caves of the Cracow-Częstochowa Upland* (1973); the author has named 6 bat species in the publication.

The research on bats inhabiting the caves of the Wieluń Upland was initiated in the years 1981–1983 by Grzegorz Lesiński. In his work *The Bats of the Wieluń Upland* (1983) he names 9 bat species inhabiting that region.

The end of 1980s brought considerable progress in the research on bats. A significant role in that field was played by the Chiropterological Information Centre (C.I.C), functioning at the Institute of Systematics and Evolution of Animals PAS in Cracow. It is directed by eminent chiropterologist Bronisław W. Wołoszyn, who is the organiser of Winter Bat Censuses (DSN). The results of the research conducted within the framework of the DSN, have been published, among others, in the article of Tomasz Postawa, Andrzej Węgiel and Jerzy Zygmunt entitled *The Decades of Bat Census in the Częstochowa Upland* (1994).

B. W. Wołoszyn is also involved in the research of pre-historic bats of the Holarctis. His article, co-written with Katarzyna Ochman, entitled *The Analysis of the Holocene Fauna of Bats (Chiroptera) in the Jaskinia pod Sokolą Górą (Cave under Sokola Góra)* (2000) concerns the Quaternary. In the subfossil material analysed, Wołoszyn identified 11 species of bats.

Kazimierz Kowalski concentrated on the Pliocene and Pleistocene mammals of the northern part of the Silesia-Cracow Upland. In his article entitled *Insectivores, Bats and Rodents from the early Pleistocene bone breccia of Podlesice near Kroczyce* (1956) he described the Pleistocene fauna, while his article entitled *Cricetidae i Microtidae (Rodentia) from the Pliocene of Węże (Poland)* (1960) is devoted to the Pliocene fauna.

The paleozoological publications concern also the early Pleistocene and Pliocene malacofauna of the Częstochowa Upland; their author is Ewa Stworzewicz (1981, 1994).

The ornithofauna of the region in question has become more familiar to us owing to the works of Józef Markiewicz; in his article entitled *From the Research on the Częstochowa Region Fauna* (1965) he lists 121 species of birds. The work *Materials on the Avifauna of the Northern Part of the Cracow-*

Częstochowa Upland (1977) is a significant publication from this author and lists 196 species from that region.

The avifauna of the Wieluń Upland has been described in the article authored by Jolanta Bagrowska *Introductory Remarks of Avifauna on the Załęcze Nature Park Area* (1986); 116 species of breeding birds have been identified there.

The complex research of herpetofauna was conducted in the years 1960–1990 by Leon Kowalewski. In his work entitled *The Amphibians and Reptiles of the Częstochowa Area* (1967) the author makes a survey of 12 species of amphibians and 6 species of reptiles.

The summary of his research in the field of the phenology and ecology of amphibians has been presented in his work *Observations on the Phenology and Ecology of Amphibia in the Region of Częstochowa* (1974).

Another publication by the same author *Herpetofauna of the Częstochowa Upland and its changes during the last 20 years* (1992) presents the transformations in the populations of amphibians and reptiles that have occurred in the period in question.

The research in the area of entomology was in 1970s conducted by Andrzej Władysław Skalski. The results of his research conducted in the years 1985–1990, have been presented in the article entitled *Changes in butterfly fauna of the Częstochowa Upland* (1992), where he mentions 19 species of butterflies occurring in that region and suggests that 7 species be considered extinct, among others, *Limenitis populi*, *Boloria aquilonaris*, *Hipparchia statilinus*, *Lysandra bellargus*.

He includes a full list of the species found in that period in the work *Distribution of butterflies (Lepidoptera: Papilionoidea+Hesperioidea) on the Częstochowa Upland* (1992).

The new localities of *Zygaena carniolica* from the Częstochowa Upland have been indicated by him in the work *Burnet Zygaena carniolica (Scop.) (Lepidoptera: Zygaenidae) on the Częstochowa Upland* (1992).

The underground fauna and especially the invertebrates inhabiting the caves of the Częstochowa Upland, have become known as a result of the works of Waclaw Szymczakowski and Andrzej W. Skalski.

The latter, in the paper entitled *Materials on the Invertebrates from the Caves of the Cracow-Częstochowa Upland* (1973) presents a systematic list of invertebrates inhabiting the caves of the Cracow-Częstochowa Upland. In his articles published in 1978 and 1980 he describes the new localities of *Niphargus tatrnensis* and *Niphargus leopoliensis*. In 1982 A. W. Skalski introduced, for the sake of experiment, the Pyrenean beetle *Speonomus hydrophilus* in the Towarnie Mountains near Częstochowa, which he described in his article *Experimental acclimatization of Speonomus hydrophilus Jeannel, 1907 (Coleoptera: Catopidae, Bathysciinae) in Poland* (1992).

In modern times the geological research is continued by Stefan Zbigniew Różycki, who in his paper *Upper Dogger and Lower Malm of the Cracow-Częstochowa Jurassic Upland* (1953) performs a stratigraphic division of the Middle Jurassic and Upper Jurassic on the basis of the ammonite fauna.

The studies of the stratigraphy of Rhaetic and Lias of the northern part of the Silesia-Cracow Upland were conducted by Jerzy Znosko; his work entitled *Rhaetic and Lias Between Cracow and Wieluń* (1955) is a monograph devoted to those periods.

Since the 1960s, Andrzej Wierzbowski has been doing geological research concerning the stratigraphy of the Jurassic in the area in question. In his article entitled *The Lower Kimeridgian in the Częstochowa Region (Polish Jura)* (1964), he indicates the occurrence of Lower Kimeridgian formations in that area. In his paper entitled *The Problem of the Oxford-Kimeridge Border in the Northern Part of the Cracow-Częstochowa Jurassic Upland* (1965) he attempts the definition of the course of the Oxfordian-Kimeridge border in the Częstochowa region more precisely. In the paper *Upper Oxfordian and Lower Kimeridge of the Wieluń Upland* (1966) he presents the lithology and the biostratigraphy of the youngest Malm formations of the Wieluń Upland based on the ammonite fauna. He discusses the ammonites and the stratigraphy of the Upper Oxfordian of the Wieluń Upland in the paper *Ammonites and stratigraphy of the Upper Oxfordian of the Wieluń Upland* (1978) while the ammonites and the stratigraphy of the Middle Jurassic between Częstochowa and Wieluń are dealt with in his paper entitled *Ammonites and stratigraphy of the uppermost Bajocian and Lower Bathonian between Częstochowa and Wieluń, Central Poland* (2000) which he wrote in cooperation with A. Matyja.