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ADAM NADACHOWSKI & LARS WERDELIN

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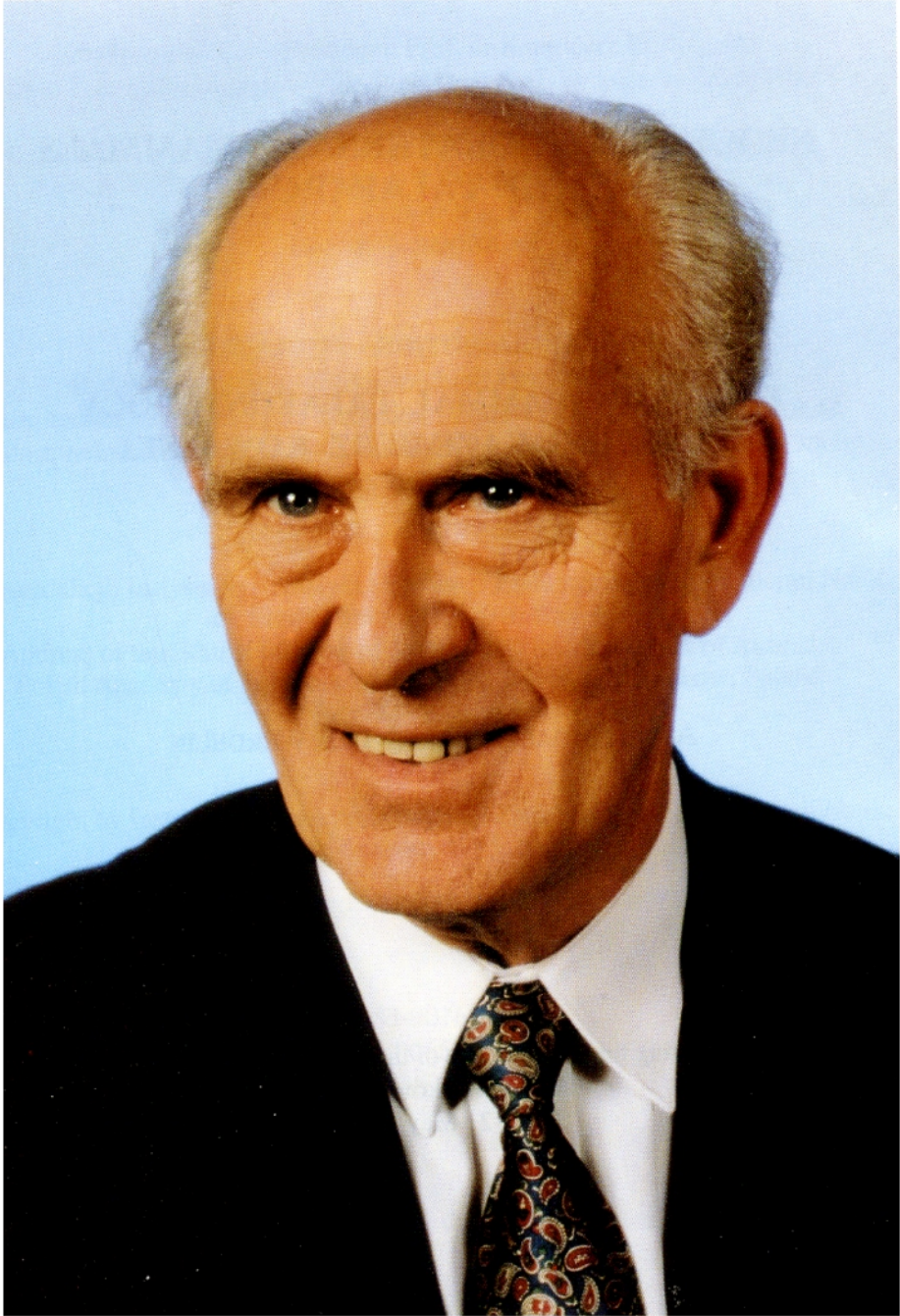
**NEOGENE AND QUATERNARY MAMMALS  
OF THE PALAEARCTIC**

**PAPERS IN MAMMAL PALAEOLOGY  
HONORING KAZIMIERZ KOWALSKI**

Edited by

Adam NADACHOWSKI & Lars WERDELIN

Incorporating the Proceedings of the International Conference  
Held in Kraków, Poland  
17-21 May 1994



*K. Korvelski*

## PREFACE

The conference 'Neogene and Quaternary mammals of the Palaearctic' that we see the printed results of in this volume originated as a tribute to the scientific activities of Kazimierz KOWALSKI. It was developed as one offshoot of the European Science Foundation network on 'Quaternary Mammalian Faunas', which in the years 1991-1993 organised three workshops dealing with important aspects of the evolution of mammalian faunas during the Quaternary. The conference was held in Kraków, 17-21 May, 1994. It included 101 participants from 26 countries.

On the first day a special ceremonial session took place celebrating Kazimierz KOWALSKI's almost 50 years of service to the field of mammalian paleontology. During the subsequent sessions, a total of 39 oral presentations were made and 57 posters presented. There was no central theme to the conference other than that indicated by the title, and papers were presented on mammalian systematics, evolution, taphonomy, palaeoecology and biostratigraphy in the Neogene and Quaternary. In addition, three round-table discussions on specified themes were organised: 'Evolutionary dynamics and classification of phyletic series' (conveners: R. MARTIN and L. WERDELIN), 'The *Allophaiomys* problem and early stages of *Microtus* evolution' (convener: J. AGUSTÍ) and 'Biostratigraphic and chronostratigraphic correlation of the Neogene and Quaternary mammal localities of the Palaearctic' (conveners: R. DAAMS, O. FEJFAR, E. VANGENGHEIM).

Papers discussing systematics and/or new taxa form 31% of the total, while papers that are regional surveys of mammalian palaeofaunas represent 27%. Articles on mammalian evolution form 19% of all papers, while biostratigraphic problems (11%), palaeoecology (6%), taphonomy (3%) and new methodologies (3%) make up the rest.

Some 62 scientific papers related to the conference are published here. Not all were presented in Kraków; some contributors who were unable to attend were invited to contribute to this volume and to thus honour Kazimierz KOWALSKI. Taken as a whole the contents of this volume make a forceful statement concerning the importance of mammalian palaeontology to studies of the biology of mammals and also show the dynamic state of the field.

After the conference a one-day scientific excursion was organized. It took the participants to karst localities with Neogene and Quaternary mammals in the Kraków-Częstochowa upland.

The following colleagues assisted in the compilation of this volume by reviewing papers: J. AGUSTÍ, P. BRUNET-LECOMTE, J. CHALINE, R. DAAMS, C. DENYS, V. EISENMANN, M. ERBAJEVA, V. FAHLBUSCH, O. FEJFAR, F. FLADERER, A. FORSTEN, M. FORTELIUS, L. GINSBURG, G. HAYNES, G. DAXNER-HÖCK, L. L. JACOBS, W. v. KOENIGSWALD, L. KORDOS, K. KOWALSKI, A. LISTER, A. MARKOVA, R. MARTIN, E. MARTIN-SUAREZ, J. MICHAUX, A. NADACHOWSKI, G. RABEDER, J. REUMER, B. RZEBIK-KOWALSKA, B. SALA, R. SAVAGE, A. SHER, G. STORCH, E. STWORZEWICZ, D. TORRE, A. TURNER, T. VAN KOLFSCHOTEN, L. WERDELIN and M. WOLSAN.

The editors wish to express their appreciation to all the contributors and reviewers, who have worked so hard to pay a worthy tribute to our friend and colleague Kazimierz KOWALSKI. We are grateful to the staff of *Acta zoologica cracoviensia* and especially to Zygmunt BOCHEŃSKI and Ewa ŻYCHOWSKA for the support and assistance that has made it possible to publish these proceedings.

We wish to dedicate this volume to Kazimierz KOWALSKI in acknowledgement of his achievements as a scientist, his devotion to natural history and his efforts on behalf of our scientific community.

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## KAZIMIERZ KOWALSKI: A BIOGRAPHICAL SKETCH

Kazimierz KOWALSKI was born in Cracow 15 March, 1925 into the family of Jagiellonian University professor Tadeusz KOWALSKI and Zofia MEDWECKA, a medical doctor. He attended high school (gymnasium) before the Second World War, and completed his studies by 1943, passing courses in secret. Immediately after, he began attending classes in biology at the Jagiellonian University, officially closed under German occupation, but secretly working underground. He graduated from this University in 1947 and obtained his PhD in 1949. His thesis was based on the description of daily activity rhythms in two common rodents and their dependence on lighting conditions.

From 1948 to 1954 he worked as a research assistant and instructor at the Department of Animal Psychology and Ethology at the Jagiellonian University, and was interested in the ecology and biology of small mammals. In 1954 Dr. KOWALSKI changed his job and continued his research in the Cracow Branch of the Institute of Zoology of the Polish Academy of Sciences (now the Institute of Systematics and Evolution of Animals). From that time onward his career has been linked to this Institute.

In 1962 Dr. KOWALSKI became professor of zoology. He was appointed as the director of the Institute and served in this capacity for many years (1960-1978, and again in 1985-1987) and also headed its Department of Vertebrates. Under his direction the Institute became an independent research unit of the Academy (1960). This long stay in the Institute was interrupted only for 5 years (1978-1983) when Professor KOWALSKI went to Algeria, where he lectured in zoology at the University of Oran and studied the mammalian fauna of this country.

The scientific interests of Kazik KOWALSKI (as he is known to his friends) are well known to zoologists, paleontologists and speleologists. As a zoologist he studied the ecology of forest rodents and their activity rhythms. He studied the distribution and migration of bats and the ecological conditions of their hibernation. One of the results of these studies was a book: "Our bats and their protection" (1954), which was later translated into English (1969). Kazik was also interested in the morphological characteristics of mountain rodents and contributed to research on the mammal fauna of selected regions and national parks. This interest in the mammal fauna of Poland was later extended, and was summarized in "Keys to vertebrates of Poland. V. Mammals" (1964). Professor KOWALSKI had initiated this series, and was the editor of the part devoted to Mammals, of which he wrote half the text. He participated in the next two editions of this book.

KOWALSKI's interest in living mammals was revived many years later, when he worked in Algeria (1978-1983). He collected more than 5000 specimens, published several papers on the adaptation of mammals to living in subtropical climates and above of all, prepared a monograph (together with his wife Barbara RZEBIK-KOWALSKA) on "Mammals of Algeria" (1991). This was based on studies lasting 12 years and gave an up to date summary of the recent mammal fauna of Algeria, its origin and evolution.

After his move from the Jagiellonian University to the research institute of the Polish Academy of Sciences, Kazik KOWALSKI's studies took a change in direction. After 1954 he became more and more involved in the systematics and evolution of mammals and began investigating fossil mammals, predominantly rodents from Tertiary and Quaternary deposits. This was soon to become his main area of study. It would be difficult for me to summarize in detail all of his work in this field, and I can offer only a very brief recapitulation of his most important results. Kazik discovered and studied mammal faunas from many Miocene to Holocene sites in Poland and described 24 new taxa of fossil shrews, bats and rodents. He investigated the evolution of mammal faunas and various larger groups of arviculids, gliroids, gerbillines, zapodids and sciurids. This rich material enabled him to formulate important conclusions concerning paleoclimatic changes in Poland. A succession of mammal faunas from Paleolithic sites enabled him to reconstruct the environmental conditions of the oldest human occupation of Poland. During his study tours abroad he investigated the fossil mammal faunas of other countries. He prepared monographs on Pleistocene rodents of Great Britain (together with A. SUTCLIFFE) and Japan (together with Y. HASEGAWA), participated in the investigation of the Bacho Kiro Cave in Bulgaria, as well as deposits in Czechoslovakia, Yugoslavia, China, Japan and Mongolia.

Professor KOWALSKI's most recent interest is concentrated on the Miocene mammals of the Belchatów brown coal deposits. This is a very rich mammal fauna, which includes, among other taxa, representatives of the genus *Neocometes*, known from the Miocene of Europe and Thailand. These finds suggest an uninterrupted expanse of tropical forest from southeast Asia to Europe. In addition he found mastodont teeth, one of the oldest dated finds of Proboscidea in Europe.

Professor KOWALSKI was an active member of the steering committee of the European Science Foundation network "Quaternary Mammalian Faunas", which promoted research on the evolution of the mammalian fauna of the Quaternary of Europe.

During the last few years Professor KOWALSKI has become very much involved in taphonomy. He has already presented some of his own results and propagated these ideas in several articles.

As a young man Kazik eagerly practiced caving and took part in many expeditions to caves in the Tatra Mountains, as well as many other caves in Bulgaria, Czechoslovakia, France, Cuba and Mexico. As a zoologist, he observed cave animals and collected scientific material for his studies. He investigated bat distribution and ecology, analysed cave sediments, with breccias containing mammal fossils. He soon became an authority on cave faunas and authored an extensive study of the "Cave fauna of Polish Tatra Mts" (1956) and a fundamental three volume monograph "Polish caves" (1952-1954), which contains detailed description of all known caves. Through popular books and many articles and notes (some 80 publications between 1946 and 1961) he promulgated knowledge of the caves and the need for protecting them. Among these publications were such books as "Life in caves" (1956), and "Polish caves" (1965). This writing stimulated further interest in the scientific exploration and protection of caves. Kazik was one of the organizers of caving in Poland, founded the Speleological Section of the Nicolaus Copernicus Society of Naturalists and chaired it for many years.

Professor KOWALSKI has published 11 books and many articles. The total number of publications from his pen is probably about 550, including original books, chapters and papers containing first-hand materials (ca 120), reviews, congress reports and abstracts, popular articles, notes and entries in encyclopedias. Counting the total volume of books (of one edition only), scientific papers and more important articles this is no less than 6000 printed pages! We can see him as an unusually productive and efficient author.

Kazik KOWALSKI has also edited several books (e. g., "Keys to Vertebrates of Poland", 1960-1971, which he initiated, chaired the editorial board of and was the editor of part 5, devoted to mammals, "Small Zoological Vocabulary, Mammals" - 4 editions between 1973-1992, and "History and evolution of the terrestrial fauna of Poland", 1989). He was the editor-in-chief of *Acta Zoologica Cracoviensia* for 14 years (1971-1984) and he has been the editor of *Folia Quaternaria* from its inception in 1960. He is a member of several editorial boards of different periodicals in

Poland and abroad, including *Acta Theriologica*, *Folia Biologica*, *Evolutionary Theory* (USA), *Paleovertebrata* (France), and *Quartärpaläontologie* (Germany).

Kazik KOWALSKI enjoys traveling immensely and has visited many countries in Europe, Africa, America and Asia. These trips include study tours or longer stays as visiting professor as well as scientific expeditions. He was the head of the first Polish- Mongolian Expedition to the Gobi Desert (1964), organized from the Polish side by the Institute of Paleobiology in Warsaw. He also organized and headed a zoological expedition to some countries of the Near East in 1977. Kazik has represented Poland at many conferences and congresses, including the first four International Theriological Congresses. All these visits abroad have been connected with collecting new material and bringing it to the Institute in Cracow, or the investigation of already existing museum collections. This usually resulted in new publications, frequently prepared together with colleagues from the countries he visited. These study tours increased KOWALSKI's knowledge of the recent and fossil mammal fauna of the world and brought about new scientific contacts, co-operation and friendships. Several of these colleagues have described new taxa in his honour.

Unlike university professors, Kazik has not had to teach students when working in the research institute. In several cases he has, however, acted as a supervisor of master's and PhD theses. He is also frequently appointed as a reviewer of theses in mammalogy, presented at various universities or research institutes, and has also acted as appraiser of the scientific output of several mammalogists in Poland. The fact that he does not regularly teach in the classroom situation does not mean that he has no contact with students. He trained students of biology at summer field courses, and spend 5 years in Algeria devoting himself mainly to lecturing in zoology. However, Kazik's main contribution to teaching has been his books. As co-author of the handbook of "Vertebrate Zoology" (1979) he is responsible for sections on "mammals" and "zoogeography". He wrote a textbook of mammalogy ("Mammals. An outline of theriology" 1971) that has been translated into English (1976) and Spanish (1981).

Professor KOWALSKI plays a very important part in the scientific life of Poland. Polish mammalogists know that the Theriological Section of the Polish Zoological Society was organized in 1962 on his initiative. It was also chaired by him for the first few years. Kazik actively participates in several committees and commissions of the Polish Academy of Sciences and on scientific boards of some institutes and national parks. He was scientific secretary (1958-1969) and chairman (1984-1987) of the Committee for Zoology PAS, deputy Scientific Secretary or presidium member of the Cracow Branch of PAS. He served for two terms as a member of the Central Qualification Commission, a body which accepts scientific degrees and professorial nominations in Poland. Recently, Kazik has been very active in re-starting the activities of the Polish Academy of Arts and Sciences in Cracow. He undertook the responsibility of organizing of the scientific Station of PAAS in New York.

Kazik KOWALSKI's scientific achievements have been well recognized by the community of Polish zoologists and paleontologists, who nominated him for membership in the Polish Academy of Sciences. In 1971 he was elected corresponding member, and in 1986 full member of this Academy. After restoring the activities of the Polish Academy of Arts and Sciences (1990) he was also elected an active member and played an important role in its governing body (deputy chair).

In 1994 Professor KOWALSKI was elected President of the Polish Academy of Arts and Sciences.

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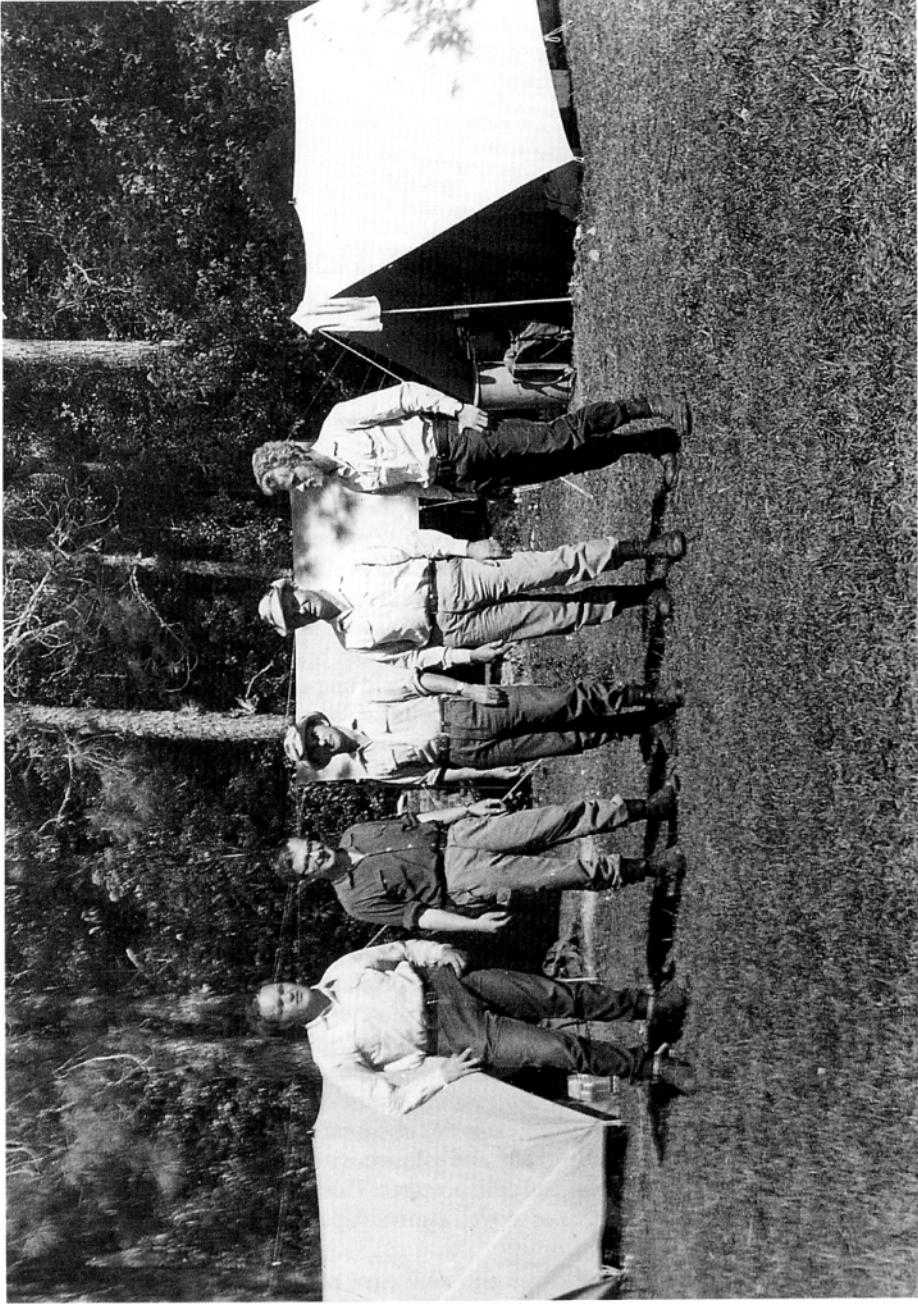
## **KAZIMIERZ KOWALSKI AS THE MOST PROMINENT POLISH SPELEOLOGIST AND CAVER**

Professor KOWALSKI is not only an outstanding zoologist and vertebrate palaeontologist, but also a prominent speleologist and caver. These latter activities should be mentioned here because his attainments are of great importance.

Kazimierz KOWALSKI began caving in the vicinity of Cracow as a boy before the Second World War. He began a systematic survey of caves in the Cracow upland during the dangerous times of the War and extended this work to encompass all of Poland just after the war. He published many papers on this subject (KOWALSKI 1950), including the monumental monograph "Caves of Poland" (KOWALSKI 1951a, 1953a, 1954). This monograph contains a complete review of all that is known of karst and caves in this country, with an unrivalled annotated bibliography. However, the value of this monograph lies mostly in the original descriptions and maps of 658 caves. During this work he showed broad interdisciplinary knowledge and penetrating scientific ability, which are seen in the many references to this monograph in subsequent books and papers. This monograph forms the starting point of modern speleology in Poland (cf. WÓJCIK 1981).

K. KOWALSKI had as a zoology student combined his caving interest with biospeleological observations, which gave him material for many papers on cave bats (e. g., KOWALSKI 1951b, KOWALSKI 1953b). During his cave survey, he found new localities of Pliocene and Pleistocene fossil vertebrates in cave deposits, which shifted his scientific activity towards vertebrate palaeontology, and this subject became his main scientific field over the next decades. Here I can mention the discovery of the important Pliocene vertebrate fauna in Podlesice (KOWALSKI 1951c, 1956) and many papers on Pliocene and Pleistocene vertebrates from localities found by other geologists and archaeologists in cave deposits. He concentrated his interest in the at that time poorly known micromammals, which are very important for Cenozoic stratigraphy and palaeoecology. He began very early with broad interdisciplinary collaborations with archaeologists, geologists and geomorphologists, not only as a laboratory expert determining bones of mammals, but also as a careful field collaborator collecting micromammals. Due to this cooperation we have at present very useful data on the Neogene and Quaternary stratigraphy and paleogeography of Poland, which was mostly established by KOWALSKI and his students and collaborators. This knowledge has been summarized and presented at international conferences or in well known papers and monographs several times (e. g., KOWALSKI 1962, 1964, 1989).

K. KOWALSKI has discovered many caves and new cave passages, as well as gained many sportive and technical successes in caving (BARYŁA 1980, 1981, 1985). He gained his first success in cave diving (Zwolinski's Syfon in the Zimna Cave, Tatra Mts.) in 1953. Two times he broke records in vertical caving in Poland: -160 m in 1951 and -213 m in 1952 (both in the Miętusia Cave, Tatra Mts.). Moreover, jointly with French cavers he reached a world record in vertical caving in August 1956 (-1122 m) in the Gouffre Berger (France, Isère, Plateau Vercors). This world record



Phot. 1. Expedition to caves in Mexico, 1969. From right to left: Bronisław KOISAR, Kazimierz KOWALSKI, Maciej KUCZYŃSKI, Ryszard GRADZIŃSKI, Wojciech SKARZYŃSKI. Phot. B. KOISAR.

in vertical caving was beaten only 10 years later, since the depth of -1171 m reached in 1956 by French cavers in the cave system Pierre St.-Martin (Atlantic Pyrenees, France and Spain) was partly reached through an artificial EDF tunnel. However, by Polish cavers it was not broken until 1980.

Kazimierz KOWALSKI (nicknames among cavers "Kazik" or "Kowal") was also very active in caving and speleological organizations. He was co-founder of the Cracow Cavers Club in 1950 and of the Speleological Section of the Polish Copernicus Society of Naturalists, where he was the first President (1963-1968). He has been the organizer and leader of many caving and surveying expeditions to Polish caves since the 1950's. When the political conditions after 1955 began to permit caving expeditions to foreign countries, KOWALSKI organized and/or participated in many such expeditions to Slovakia, Hungary and Bulgaria, and since 1956 to France, Cuba and Mexico (Phot. 1). This activity was accompanied by many programmatic papers (written in Polish only) for the mimeographed caving bulletin "Grotolaz" (Caver), e. g., "Speleology and caving in Poland" (1950) and "We are travelling abroad" (1955). It was natural that Kazik was certified as one of the first caving instructors in Poland.

Really it is impossible to imagine the present state of the art in caving and the present state of knowledge of speleology in Poland without the attainments of Professor K. KOWALSKI!

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### INSECTA

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### MAMMALIA

#### Insectivora

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*Sorex dehneli* KOWALSKI, 1956

*Peisorex pohaiensis* KOWALSKI & LI, 1963

#### Chiroptera

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*Myotis dasycneme subtilis* KOWALSKI, 1956

*Myotis danutae* KOWALSKI, 1956

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#### Rodentia

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*Bjornkurtenia* KOWALSKI, 1992

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*Promimomys insuliferus* KOWALSKI, 1958

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*Stachomys trilobodon* KOWALSKI, 1960

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*Pliopetaurista meini* BLACK & KOWALSKI, 1974

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