

ANDRZEJ ŚLĄCZKA

6.02.1931–9.06.2023



Fig. 1 Professor Andrzej Ślaczka in 2016.
Photograph by Waldemar Obcowski.

Prof. Andrzej Ślaczka (Fig. 1) was an outstanding and well-known Polish geologist. He was born in Lwów, Poland (now Lviv, Ukraine), but grew up in Gdynia, where his parents moved, when he was still a child (Fig. 2). In 1949, he started geological studies at the Adam Mickiewicz University in Poznań and graduated from the Jagiellonian University in Kraków (Fig. 3). His master's thesis, "*Geology of the Jankowa Anticline, Gorlice Sheet*", prepared under the supervision of Prof. Marian Książkiewicz, was defended in 1953. At the beginning of the following year, he started working as an assistant at the Carpathian Branch of the Polish Geological Institute (CB PGI) in Kraków.

In 1961, at the Polish Geological Institute, on the basis of his dissertation, "*Geological structure of the Dukla Unit and its foreland between Wisłok Wielki and Jabłonki (Polish Eastern Carpathians)*", supervised by Prof. Marian Książkiewicz, he obtained a PhD in natural sciences. He started work as an assistant professor and, from 1963, as a senior academic staff member. In the years 1965–1978, he headed the Department of Geology of the Carpathians and Foreland of the CB PGI, and in the years 1966–1976, he was the Deputy Head of the CB PGI.

In 1970, he obtained the degree of habilitated doctor of natural sciences at the Jagiellonian University on the basis of an assessment of his general scientific achievements and his habilitation thesis ("*The geology of the Dukla unit*

(Polish Flysch Carpathians)"; in 1973, he took up the position of assistant professor at the Polish Geological Institute. In 1974, he participated in the organisation of the reactivation of geological studies in the Faculty of Biology and Earth Sciences of the Jagiellonian University. In 1977, he started working, at first part-time and, from 1979, full-time, as an associate professor in the Institute of Geological Sciences of the Jagiellonian University (Figs 4, 5). He worked there until 2005 and part-time during the years 2002–2005. He was director of the institute for 22 years (1980–2001). At the same time, he periodically cooperated with the Polish Geological Institute. In 1980, he gained the title of associate professor and, in 1989, that of full professor. Presumably, his membership in the Polish United Workers' Party allowed him to avoid several problems during most of his career.

He was a highly valued academic lecturer. In the Faculty of Biology and Earth Sciences of the Jagiellonian University, he lectured on tectonics, geotectonics, and geological cartography; he also taught a course on the geology of the Carpathians and gave a master's seminar. He was invited as a visiting professor to the universities of Naples, Palermo, Benevento, and Budapest, where he lectured mainly on sedimentology, analysis of orogenic basins, and petroleum geology in the Carpathians. He also gave lectures among others, at the universities of Cambridge, St. Andrews, Keele, London (UCL; Fig. 6), Barcelona, Dayton (Ohio),

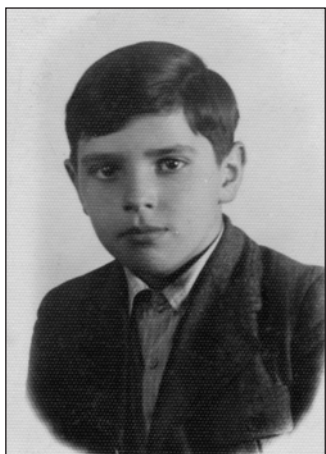


Fig. 2. Andrzej Ślaczka in his boyhood years.



Fig. 3. While studying in Poznań, a short break at the pier in Sopot. Andrzej Ślaczka, first on the left. Beginning of the 1950s (?).

New Orleans, Salzburg, and ETH Zurich. He left behind a group of former students, supervising numerous master's and doctoral theses.

Andrzej Ślaczka is widely considered to have been one of the founders of modern sedimentology. His early research, conducted together with Stanisław Dżułyński on the sedimentary structures of flysch resulted in the explanation of the origins of many of them, generally accepted in world literature, as well as in the development of one of the first palaeogeographic maps in the world, based on detailed measurements of the orientations of directional structures. Further research explained the origins of exotic horizons in the Krosno Beds of the Bieszczady Mountains. The results of his research in the Polish Eastern Carpathians were part of the basis for the palaeogeographic atlas of the Carpathians,



Fig. 4. Andrzej Ślaczka (in the middle) during a field course with students of the Jagiellonian University (beginning of the 1980s). Andrzej Koszarski (1957–2012) and Stanisław Geroch (1920–1995) is on the left.



Fig. 5. Opening ceremony of the academic year at the Institute of Geological Sciences (Oleandry Street 2a, Kraków) in October 1989. From the left, professors Andrzej Radomski (1929–2007), Nestor Oszczytko, Andrzej Ślaczka, Czesław Harańczyk (1927–1998), Elżbieta Morycowa, and Jolanta Bednarczyk (assistant).

edited by Marian Książkiewicz, the first atlas of this type in the world.

Together with Rafał Unrug (Fig. 7), he began to use mathematical methods to solve problems of flysch sedimentation, using these methods to demonstrate, among other things, the presence of three sources of clastic material for the south-eastern part of the Krosno Beds in Poland and the impact of transportation in suspension currents on grain sorting and the mineral composition of the sediment. He was also a forerunner, together with Irena Gucwa, of the integration of sedimentological and geochemical research in the Carpathians, which led, among other things, to the demonstration of the diversity of biophilic chemical elements and phytoplankton communities in the Carpathian basins and their differentiation over time. Also noteworthy



Fig. 6. Andrzej Ślęczka, in front of University College London (UCL) during the autumn of 1994.

is the first extensive study, together with Samuel Thompson III from the University of El Paso, of the detailed lithological characteristics of fluxoturbidite deposits in the Carpathian Flysch, presenting a model for them and their genesis.

The experience gained in palaeogeographic research led him to become the editor of the international atlas of palaeo-transport of detrital sediments in the Carpatho-Balkan Arc of the Carpathian-Balkan Geological Association. In partial cooperation with Andrzej Radomski, he developed models for selected marl complexes in flysch, showing that they represent megaturbidites and were deposited by density currents as submarine fans. Together with Ewart K. Walton, from the University of St. Andrews, he worked on the structural variability and genesis of the Skalnik Limestone, suggesting that this unit represents a seismoturbidite.

His sedimentological research on the Miocene (Badenian) salt deposits of the Wieliczka Mine was also groundbreaking. Andrzej Ślęczka, in cooperation with Krystyna Kolasa, demonstrated the possibility of salt strata being formed by redeposition, density currents, and underwater landslides, and not only, as previously thought, solely as a result of chemical precipitation from sea water; in particular, he proved that the salt megabreccia is in fact the product of deposition from massive submarine landslides. Subsequent research, conducted by Prof. Andrzej Ślęczka in Spain and Austria, showed that similar redeposition processes also had taken place in other salt deposits.

The fundamental results of the sedimentological research of Andrzej Ślęczka were not limited only to the Carpathians. Research carried out in the Central Apennines in the Cilento Flysch allowed the identification of marly megaturbidites and structures, resulting from the liquefaction of sandy sediments, presumably associated with submarine earthquakes. As a result, he was asked to lead the field session



Fig. 7. Andrzej Ślęczka (left) together with Rafał Unrug (1931–2000) during a seminar in the USA (1990s).

of the 15th Conference of the International Association of Sedimentologists in the Naples region in 1994 and was also invited to join the Scientific Committee of the conference.

Research on the Paleozoic Ouachita orogen in the United States allowed him to demonstrate far-reaching similarities to the much younger Carpathian orogen in structural and lithostratigraphic development, thus confirming the view that subsequent stages of development of various orogens are similar, regardless of their age. Equally significant results were achieved in work carried out in the Swiss Alps, where Andrzej Ślęczka led research on the development and age of the Helminthoid Flysch, demonstrating that it is a continuation of Lower Cretaceous formations therein. This resulted in the development of a new palaeogeographic model for this part of the Alps, together with Wilfrid Winkler from ETH Zurich and Adam Gasiński from the Jagiellonian University.

Andrzej Ślęczka presented, together with Volker Hoeck from the University of Salzburg, a new model of the development and distribution of underwater sedimentary fans in the Tauren Tectonic Window (Fig. 8). Research carried out by an international team under his supervision of the Gresten Unit in the foreland of the Northern Calcareous Alps revealed a different, younger (Early Cretaceous) age for the Konradshelm Limestone conglomerates, which significantly changed views on the geodynamic development of the northern edge of the Alpine Basin.

In cooperation with the geological centre of the University of Palermo, he described the sedimentological characteristics of alluvial-lacustrine deposits in the late Miocene Scilato Basin in Sicily and proposed a new model for its development. Also, with the centre, he conducted sedimentological and ichnological studies of lower Quaternary littoral deposits on the Sicilian Island of Favignana (Fig. 9).



Fig. 8. Andrzej Ślaczka in the Drei Brüder Massif, Tauren Tectonic Window, Austria Alps, autumn 2005.



Fig. 9. Andrzej Ślaczka in the Favignana island, S Italy, spring 2010.

The results of the basin analysis of the northern Carpathians, based on heavy minerals, conducted in cooperation with W. Winkler from ETH Zurich, led to improved identification of the source areas of clastic material and the proposal of a new model for the Late Cretaceous-Paleogene development of the foreland of the Pieniny Klippen Belt. This model suggested the presence of only thinned continental crust in the basement there.

His many years of diverse types of research in the Carpathians led to a synthesis of the development of the Flysch Carpathians, including the separation of several stages of the development of their oldest sediments, from tensional conditions and rifting in the latest Jurassic and earliest Cretaceous to the period of compression in the Albian, as well as to cooperation in the development of palinspastic maps for the Carpathian-Alpine arc.

As part of his sedimentological studies, Prof. Andrzej Ślęczka conducted research on fluvial and shallow-water sediments of various ages. Together with Hanna Senkowicz, he identified the sedimentary environments of the Buntsandstein and Röt (Lower Triassic) of the northern margin of the Holy Cross Mountains. Studies of the Paleozoic clastic formations of the Western Carpathians basement showed that a significant part of them represents the Cambrian, and not – as previously assumed – the Devonian. This significantly changed previous views on the geodynamics of this region.

Andrzej Ślęczka was also an outstanding specialist in the regional geology of the Carpathian orogen. His research was concerned primarily with the south-eastern part of the Polish Flysch Carpathians. Thanks to this work, he explained the geological structure of one of the most interesting areas of the Carpathians, namely a bridge between the Silesian Unit and units of the Eastern Carpathians. First of all, he discovered a complete Cretaceous and Paleogene sedimentary succession in the Bystre Thrust Sheet, which shows Eastern Carpathian features, and the thrust-sheet-diapiric structure of the Fore-Dukla Zone. He also prepared a monograph on the stratigraphy, tectonics and palaeogeography of one of the five basic units of the northern Carpathians – the Dukla Unit. The effect of his cartographic work included preparation of numerous sheets of the Detailed Geological Map of Poland at a scale of 1:50,000, including the Jabłonka, Przemyśl, and Wetlina sheets. Research carried out in this region of the Carpathians and the Eastern Carpathians has shown the effects of the impact of the Early Cretaceous East Carpathian orogeny on the development of the Silesian Basin.

The second area of research of Prof. Andrzej Ślęczka covered the Central Carpathians between Łososina and Biała Dunajcowa. The result of the research on the Silesian Unit was the establishment of the detailed lithostratigraphy of the area, the identification of many exotic horizons, and the discovery of an unknown variegated facies of the Upper Cretaceous-Paleogene in the southern part of the Silesian Unit. The research enabled a synthesis of the lithostratigraphy, tectonics and palaeogeography of the Carpathians in the monographic work *“Geology and Mineral Raw Materials of Poland”* (1970, *Biuletyn Instytut Geologicznego*, vol. 251), as well as a summary of Cretaceous stratigraphy (co-authored) in the *Geology of Poland, Volume 1, Part 2* (1973).

Research carried out in subsequent years on exotic andesitic rocks in the Żegocina Tectonic Window zone and their isotopic age showed that the southern part of the European Plate already began to break up in the Early Jurassic, in association with outflows of andesitic lavas. Research conducted together with Adam Gasiński on the Upper Cretaceous sediments of the Sub-Silesian Unit in the area of Żegocina and Węglówka provided detailed data on their lithology and age. In cooperation with A. Gasiński, he demonstrated for the first time in the Carpathians the presence of variegated marl facies on the southern edge of the Silesian Basin.

Research on the deep basement of the Flysch Carpathians through deep drilling revealed, among other things, the deep structure of the Fore-Dukla Zone, which resulted in the discovery of natural gas at Wetlina, documenting the wide variation of the Palaeozoic-Mesozoic basement under the Carpathians, as well as the discovery of hard coal deposits under the Carpathians in the Sucha Beskidzka area. It also permitted the first interpretation of the platform basement of the Northern Carpathians, based on seismic data.

Thanks to his experience in the field of deep structures, the Oil and Gas Institute invited him to coordinate analytical studies of the Carpathians and their basement in exploration for hydrocarbon accumulations. The research into deep geological structures resulted in numerous important publications on the possible occurrence of hydrocarbons in the south-eastern part of the Polish Carpathians and in eastern Slovakia, as well as on the development of new prospects in the exploration for bitumen deposits in the Carpathians. The research also resulted in a geological interpretation of the Flysch Carpathians and their deep basement for the CELEBRATION 05 profile, made during the course of deep seismic soundings.

As part of his research on the Neogene substrate of the Carpathians, Andrzej Ślęczka discovered an unknown lithofacies of lower Miocene deposits in the area of Sucha Beskidzka under the Carpathian overthrust, presented its lithostratigraphic characteristics, and distinguished a number of new lithostratigraphic units. The discovery of the previously unknown lithofacies initiated the search for hydrocarbons in the area by oil companies. He collaborated fruitfully with Nestor Oszczytko in research on the development, age, and correlation of Neogene formations in the Carpathian Foredeep in Poland and Ukraine.

The significant results of his research on the development of the Carpathian Foredeep resulted in Andrzej Ślęczka being invited to cooperate in the development of the Neogene *“Palaeogeographic Atlas of Central and Eastern Europe”* (1988) as the editor of the Polish part. Within the Comecon countries, he was the manager of the project *“Lithostratigraphy and sedimentation of the Carpathian-Balkan area”* (1965–1972), and within the Carpathian-Balkan Geological Association, the project *“Paleotransport in the Carpathian-Balkan Mts. System”* (1965–1982). Additionally, he managed the project *“Peritethys-Carpathian Foredeep”* (1992–1997) and the Polish-Ukrainian research programme *“Salt-bearing formations of the Zgólbice and Sambor units, the Carpathian Foredeep, correlation, age, and paleogeography”* (2000–2003).

During the last two decades of the 20th century, he co-edited the Polish-Italian programmes: “*Basin analysis and sedimentation of Cilento Flysch (Middle Apennines)*” with the University of Naples and “*Basin analysis of Neogene basins in Sicily*” with the University of Palermo, and in the last decade of the 20th century, the programmes “*Geodynamics of Upper Prealpine Nappe (Switzerland)*” and “*Sedimentary structures and paleoenvironment of the epimetamorphic rocks of the Tauren Window (Alps, Austria)*”.

Andrzej Ślącza is the author of over 155 scientific papers and numerous abstracts of presentations at national and international conferences, as well as a valued populariser of geological knowledge and the co-author of several geological field guides to the Flysch Carpathians, guides to field sessions as part of meetings of the Polish Geological Society, congresses of the Carpathian-Balkan Geological Association, and other conferences. He is the main author of the first English-language guide to the Polish Flysch Carpathians.

From 1955, he was a member of the Polish Geological Society, and from 1995, he was an Honorary Member. For 64 years he was a member of the society's governing bodies. In the years 1959–2003, he was a member of the Main Board, serving as Deputy Treasurer, then Treasurer (1959–1977), Secretary (1977–1983), Vice-President (1983–1989), and later President (1989–2003). In turn, in the years 2003–2023, he was a member of the Main Audit Committee, including its Chairman in the years 2003–2021. He was also the Chairman of the Sedimentological Section and the Tectonic Section of the Polish Geological Society. He organized and co-organized six scientific meetings of the society. Thanks to his efforts, the Polish Geological Society became affiliated with the American Association of Petroleum Geologists (AAPG).

Professor Andrzej Ślącza also conducted scientific activity in the Carpathian-Balkan Geological Association, where he chaired the Sedimentological Commission for almost 40 years (1963–2002). As Chairman of the Sedimentological Commission of the Committee of Geological Sciences of the Polish Academy of Sciences, he was the initiator and later Chairman of the Organizing Committee of Seventh European *Regional Meeting* of the International Association of Sedimentologists (IAS) in Kraków (May 23–25, 1986), which played a very important role in the development of sedimentology in Poland and neighbouring countries. He was President (1999–2001) of the Association of European Geological Societies and, in 1997–2003, a member of the board of the European Federation of Geologists.

The impressive knowledge and widely recognized scientific achievements of Prof. Andrzej Ślącza were the basis for his election as a Corresponding Member of the Polish Academy of Arts and Sciences in 1993 and later an Active Member in 2018, as well as to the Committee of Geological Sciences of the Polish Academy of Sciences (1970–2006), the Geological Commission of the Kraków Branch of the Polish Academy of Sciences, the Committee for the Assessment of Geological Projects (1985–1992), the Programme Council for the Exploration of Oil and Natural Gas Deposits (1985–1992) and the Geological Council of the Minister of the Environment (1999–2005). He also was appointed co-editor of the Carpathian sheets of the Geological Map of Poland 1:200,000 and a

member of the Scientific Council of the Cracow Saltworks Museum in Wieliczka (1992–1998). Recognition of the scientific achievements of Prof. Andrzej Ślącza, led to his appointment as a Corresponding Member of the Austrian Geological Society (2000), and an Honorary Member of the Slovak Geological Society (1981), the Hungarian Geological Society (1985), and the Serbian Geological Society (2001). He was also a member of the editorial boards of the journals: *Annales Societatis Geologorum Poloniae* (1973–1985), *Geologica Carpathica* (1995–2001), and *Mitteilungen der Österreichischen Geologischen Gesellschaft* (2001–2007).

Prof. Andrzej Ślącza was awarded the Silver Cross of Merit (1970), the Gold Cross of Merit, the Knight's Cross (1988) and later the Officer's Cross of the Order of Polonia Restituta (2001), the Medal of the Commission of National Education (1983), the Gold Badge of Merit for Polish Geology (1980), and the Badge “Distinguished Employee of the Geological Institute” (1979). He also received the H. Świdziński Award of the Polish Geological Society (1972) and many awards from the Rector of the Jagiellonian University. In 2003, he was one of the first Poles to receive the title of European Geologist (EurGeol), awarded by the European Federation of Geologists in Brussels.

He was buried in the family grave at the Batowicki Cemetery, in Kraków.

*Alfred Uchman, Tadeusz Peryt, Mariusz Kędzierski
& Małgorzata Perier-Włodarska*

List of selected publications by Prof. Andrzej Ślącza

Full list of publications by Andrzej Ślącza, prepared by Małgorzata Perier-Włodarska, is available online in Supplementary Material.

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