

## IN MEMORY OF PROFESSOR (PROF. DR. HAB. ENG.) JACEK MARIA RAJCHEL (1944–2020)

On April 5, 2020, our dear friend, Jacek Rajchel (Fig. 1), a warm, smiling and optimistic man, passed away at the age of 76. He was an outstanding naturalist and geologist, popularizer of science, lover of architecture and academic lecturer, devoted to didactic work. He was also closely associated with the Kraków scientific community; a scientist whose research achievements made a huge contribution to the natural sciences.

Professor Jacek Rajchel was born on January 30, 1944, in Chełm, in a medical family. The Rajchel family moved back to Kraków, where Jacek Rajchel grew up, graduating from primary school and the Bartłomiej Nowodworski High School. His interests in nature, tourism and sports came from the family home, where these passions were nurtured. He recalled, years later, his family home, full of warmth, but also of literature and science books, popular science periodicals and discussions with his siblings about nature, sports and expeditions.

In 1962, Jacek Rajchel joined the AGH University of Science and Technology (AGH UST) in Kraków, where, following his interests, he first began studies at the Faculty of Geology and Exploration and for over 50 years, professionally and with great commitment, he addressed a wide range of geological issues. He became interested in the geology of the Carpathians during his studies. He joined the Geologists' Scientific Club, where Dr. Janusz Kotlarczyk, later his scientific mentor, analyzed specimens of exotic rocks from Carpathian deposits. In 1968, Jacek Rajchel graduated with a Master's degree in engineering, specializing in earth materials.

Immediately after graduation, he became an assistant at the Department of Geology in the Faculty of Geology of the AGH UST (Fig. 2), where in the research team of Prof. Henryk Świdziński, he gained scientific and didactic experience. There, he had the opportunity to work with eminent experts on the Carpathians. After 10 years, in 1978, he obtained a doctoral degree, defending his dissertation entitled "Geological structure of the San River in the area of Dynów-Dubiecko", for which he received the Award of the Rector of AGH UST. He obtained his habilitation in 1991, the basis of which was the monographic study "Lithostratigraphy of sediments of the Upper Paleocene and Eocene of the Skole Unit". In 2008, he was nominated as a professor for his lifetime scientific activity (Fig. 3).



**Fig. 1.** Prof. Jacek Rajchel (1944–2020).

Professor Jacek Rajchel dealt with what were broadly understood as the Earth sciences. The core of his interests was geology. In the first years of his scientific work, he took up issues, related to aspects of siliceous rocks and the stromatolite structures of the Kraków-Częstochowa Upland. Then he started his research in the Outer Carpathians and in the Carpathian Foredeep, which became a long-term scientific training ground for him. He was particularly devoted to the Skole Nappe, the individual lithological units of which he analyzed in detail. The issues raised by him were very wide-ranging, from petrography and mineralogy, through stratigraphy, sedimentology, hydrogeology, cartography and regional geology, in the full spectrum of lithological and facies variability of the rocks occurring there. The academic achievements of Professor Jacek Rajchel also include a number of works on palaeontology (Fig. 4). The spectrum was very broad, including fossils of algae, vertebrates, invertebrate macrofauna and microfauna, and a group of trace fossils. He accumulated huge amounts of research material. This allowed the publication of a number of scientific works that shed new light on the history of sedimentation and the structure of the Skole Basin and today constitute a compendium of knowledge and the basis for further analysis.



**Fig. 2.** Jacek Rajchel as young assistant, 1968.

The works he wrote contain studies of many lithostratigraphic units of the Carpathians, in particular a new scheme for the stratigraphy of the Palaeogene deposits of the Skole Nappe. The publications present the characteristics of units, profiles and stratotype areas, descriptions of regional correlation horizons, usually coordinated with bio- and chronostratigraphy and with individual phases of the geodynamic development of the Carpathian basins. His detailed research contributed to the understanding of development and palaeogeographic model of the Tethys and Paratethys. Recognition of the structure as well as cartographic and sedimentological works gave grounds for distinguishing zones of tectonic and sedimentary melanges, in particular olistostromes. These studies contributed to the development of a coherent evolutionary model of the Outer Carpathians from the Jurassic to the Palaeogene.

With time, hydrogeological problems on the domain of mineral waters in the Carpathians joined the problems related to the rocks of the Outer Carpathians and the Carpathian Foredeep. Professor Jacek Rajchel dealt with the issues related to the recognition, detailed characteristics and classification of mineral waters, as well as their genesis, sediments in mineral waters, forms of springs and their types, and the therapeutic effects of the Carpathian waters on the human body. He discovered and described different sources of mineral waters, was involved in the protection of the nature of hydrogeological phenomena, in particular mineral water



**Fig. 3.** Jacek Rajchel on the day of professor's nomination, Warsaw, 2008.

springs, and prepared applications for the legal protection of individual objects. Comprehensive analyses resulted in the development of regional studies related to mineral waters.

The scientific interests of Professor Jacek Rajchel also included issues related to rock, energy and metal ores in the Carpathians, in the Carpathian Foredeep, in the Holy Cross Mountains, in the Fore-Sudetic Monocline and in the Polish Lowlands. In particular, the subject of building materials and their architectural use in the city of Kraków dominated in the works that he published in recent years. Professor Jacek Rajchel left behind numerous studies focusing on the characteristics of contemporary and historic buildings, and on individual building materials. These studies were extremely detailed, containing a comprehensive description of the building stone and highlighting all the features that made it material, successfully used in architecture. These studies concerned not only traditionally used, local raw materials but also materials imported from other regions of Poland and the world in general. A large collection of works on the border of economic geology and architecture forms a kind of coherent compendium of knowledge about the monuments of Kraków.

In addition to the three main trends of interest listed above, i.e., the geology of the Carpathians, mineral waters and stone in architecture, Professor Jacek Rajchel was also involved in studies, devoted to the history of the natural sciences, the history of health resorts, protection of the natural



**Fig. 4.** Jacek Rajchel in Museum of Nature and Technology in Starachowice, 2006.

environment and archaeology. He took part in scientific expeditions to Spitzbergen, Siberia, Ukraine and Scotland (Fig. 5). The polar expedition was related, among other matters, to the development of a sheet of the detailed geological map of the Wedel Jarlsberg Land area and research on climate change.

Professor Jacek Rajchel was a respected authority in the scientific community. He was asked to review works for scientific journals and books and to provide valuable opinions on research projects, submitted in national grant competitions. He was asked many times to prepare geological expertise, opinions and projects for local government units and industry.

In addition to publishing activities, he took an active part in editorial work. In the years 1998–2001, he was a member of the Editorial Board of the *Geological Review*, successively in 2003–2011 he was the Editor-in-Chief of *Wszelchświat*, one of the oldest scientific journals, and from 2004–2010, he was the Editor of Reports on the Scientific Committee Meetings of the Geological Sciences Commission of the Polish Academy of Sciences, Kraków Branch. In 2010, he edited a book published to mark the 90th Jubilee of the Department of General Geology, Environmental Protection and Geotourism of the AGH University of Science and Technology. Professor Jacek Rajchel was also known for his important activities and work for the scientific community. He was eager to take up activities and functions in

scientific and popular-scientific bodies and organizations. He was a member of the Scientific Council of the Institute of Nature Conservation of the Polish Academy of Sciences in Kraków, the Commission of Geological Sciences of the Polish Academy of Sciences in Kraków, the Scientific Council at the Geology Museum at the Faculty of Geology, Geophysics and Environmental Protection of AGH UST, the Social and Scientific Council in the Promotional Forest Complex – Birczańskie Forests, the Polish Copernicus Society of Naturalists, and the Secretary of the Commission for the Standardization of Stratigraphic Nomenclature of the Carpathians. For 52 years, he was a member of the Polish Geological Society, where he was a co-founder of the Mathematical Geology section, and for 36 years he belonged to the Polish Society of Friends of Earth Sciences, which was established, thanks to his efforts. In addition, he was involved in the activities of the Faculty of Geology, Geophysics and Environmental Protection, his parent unit, as the Head of the Department of General and Mathematical Geology, a member of the Faculty Council, the Commission for Awards and Decorations and a member of the Library Council. He participated in dozens of scientific conferences, where he gave lectures on geological issues. His scientific achievements include nearly one hundred conference reports on issues from various natural fields. He also took an active part in the preparation of cyclical symposiums, such as the National Conference of Palaeontologists, the Polish



**Fig. 5.** Jacek Rajchel on the morine of the Werenskiold Glacier during Spitzbergen Polar Expedition, 1985.

Geological Congress, the Congress of the Polish Geological Society, Brain Week and occasional ones, i.e., Levels with Olistoliths in the Przemyśl Carpathians, Organogenic and Organodetritic Limestones in the Outer Carpathians and their Importance for Palaeogeographic Reconstructions and a Year of a Healthy Lifestyle.

Professor Jacek Rajchel was an academic teacher for over 50 years. He educated and promoted many generations of geologists, taking care of a good and reliable geological school. He was not only excellent, but exceptional as a lecturer. He imparted knowledge of the Earth sciences with great commitment. He conducted practical and field classes, seminars and lectures in his home faculty at AGH UST and also was invited to conduct courses at other faculties. He also lectured at the University of the Third Age. The classes he conducted, because of their originality, were very popular among students. They were attractive and interesting, illustrated with ingenious experiments and demonstrations that introduced the essence of the subject. His geological erudition meant that he taught many subjects: the foundations of geology, general geology, dynamic geology, geology, structural geology and geological mapping, historical geology, regional geology, sedimentology, mathematical methods in geology, mineralogy and petrography, planetary geology, glaciology, the geotectonic foundations of the occurrence of deposits, stone in architecture, building and road construction, rocks and minerals in monument construction. He promoted many Masters and Engineering students, completing full-time and part-time studies. He was also the supervisor of 4 doctoral students. He took an active part in the organization of didactics, paying special attention

to qualitative elements. He coordinated and co-created the programs of new fields of study at AGH UST and developed new original courses for the students. Jacek Rajchel was able to talk about nature in a very interesting way, to show in a simple manner the whole complex system of interconnected elements and phenomena. He attached particular importance to outdoor activities, which for students were not only training and practice, but an experience and an adventure. He was involved in student organizations, taking an active part in the work of research clubs, in the organization of many nature activities and research trips, both domestic and foreign, to Scotland, Spitzbergen, Ukraine, Siberia and the Caucasus. He was also happy to share his knowledge and experience with younger employees. He provided a helpful opinion in solving problems of a geological nature, he willingly undertook discussions and natural polemics. He contributed to the promoting of new research staff by working on the committee for habilitation and professor applications at the Faculty of Geology, Geophysics and Environmental Protection of AGH UST. He was asked several times for reviews of doctoral dissertations and habilitation theses and made dozens of reviews of student diploma theses.

For his research and teaching activities, Professor Jacek Rajchel received several awards from the Rector of the AGH University of Science and Technology. He was awarded the Medal of the National Education Commission, the Gold Cross of Merit, the Gold Badge of Merit of the Scientific Society of Geologists and Geophysicists at the Faculty of Geology, Geophysics and Environmental Protection of the AGH University of Science and Technology; he also obtained the diploma of Mining Director of the 3rd degree.



**Fig. 6.** Jacek Rajchel at the New Zealand geysers, 2012.

Experience in the field of didactics has evolved over time into the popularization of geological knowledge, where in the Kraków community, Professor Jacek Rajchel was a leading figure (Figs 6, 7). He was mainly involved in geotourism, which focused on phenomena and features of an inanimate nature. He was the co-founder of geotourism as a new field of Earth Sciences. He initiated and introduced urban geotourism and urban geology of architecture geotourism to the Kraków community. Because he researched the issues of sedimentology, mineral resources, architecture and tourism, he disseminated the use of decorative and building stone in historical and contemporary architecture of the city of Kraków to a wide audience. He promoted geotouristic issues at scientific symposiums and conducted open tours for residents (Fig. 8). He wrote a series of popular science works, devoted to urban geotourism, which appeared in the pages of *Świat Kamienia*, *Nowy Kamienniarz* and *Dziennik Polski*, as well as the book “Kamienny Kraków”, published in 2004. This item is, on the one hand, a compendium of basic information on the geology and raw materials, used in Kraków architecture, from mineralogical, petrographic and genetic characteristics, aesthetic features of stone, places of occurrence and exploitation, and on the other hand, a source of extensive knowledge in the field of architecture and masonry, from mining techniques, machining to application in individual construction sectors. At the same time, it is a richly illustrated guide to Kraków city architecture, which includes substantively developed proposals for geotourist

trips. In recent years, Jacek Rajchel was compiling information for the second volume of the guide book, which was to have a palaeontological orientation and a focus on the presentation of the fossils of fauna and flora found in the building stones of the city of Kraków. Unfortunately, his passing interrupted this unfinished work. Jacek Rajchel, implementing his geotouristic mission, reached out to various media; he also shared his geological knowledge via the internet as well as reports and TV programs, in which he participated, preparing scenarios according to his concepts.

Activity in the field of geotourism meant that issues related to geodiversity, nature protection and the protection of geological heritage also were close to the heart of Professor Jacek Rajchel. They were discussed among collaborators, promoted among local authorities and in the scientific community through lectures and published works. He contributed to the awareness and protection of many features in the Carpathians, for which he carried out studies, published in the scientific literature and in internet databases. During discussions and speeches, he drew attention to the unique qualities of the Polish Carpathians in relation to individual features or areas. For selected features, he indicated proposals for their protection or development in order to make them more accessible to a wider group of observers. He was active in the field of geological museology, looked after the collections, and provided exhibits from private resources and geological expeditions. He was a co-founder of the Geological Museum at the Faculty of Geology and Exploration of



**Fig. 7.** Jacek Rajchel during CBGA Geological Congress, Chalkidiki, 2013.



**Fig. 8.** Geotourist trip for Cracovians guided by Jacek Rajchel, 2009.

the AGH University of Science and Technology and co-organizer of the Museum of Sedimentation Structures at the Institute of Geological Sciences of the Jagiellonian University. He also designed and organized the Stanisław Lem Geological Garden of Experiences.

Professor Jacek Rajchel was an outstanding scientist, he dealt with many aspects of geology, often crossing its borders and entering related fields. He spoke of himself – “I am a naturalist” – and he loved what he did professionally and as a hobby. He was erudite. In addition to his passion for stone and architecture, he was a devotee of nature, an excellent botanist, a lover of Polish flor and an ornithologist. He liked to work in the field and took up various sporting challenges; in particular, he liked kayaking and skiing. He also had a rather unusual hobby, collecting bricks, especially old ones. He had brought them from his many journeys. The collection he created is unique, containing the building blocks of many historical European structures.

Professor Jacek Rajchel was an excellent and great scientist. A man, who devoted himself to science and practiced it with great dedication. His research and popularization work made a huge contribution to the natural disciplines. He left us a considerable legacy, which is a sound basis for further research by the next generations of geologists. He was an exceptionally modest man, liked by all of us and appreciated by his students. His passing is an irreparable loss.

Professor Jacek Rajchel rests at the Rakowicki Cemetery in Kraków (lodging CA, row: south, place: 6). Because of the coronavirus pandemic restrictions, we could not say goodbye to him at the cemetery as we would have wished. He will forever remain in our memory as an outstanding scientist and academic lecturer, but also as a warm, cheerful, optimistic and smiling colleague and a wonderful person.

*Jacek, professor, rich in knowledge  
Finished his worldly pilgrimage.  
A loving father  
Husband and grandfather  
An avid naturalist  
An unmatched scientist.  
A brilliant geologist  
And superb journalist  
An excellent lecturer  
And custodian of wisdom  
An expert on Skole stratigraphy  
Carpathian palaeogeography  
Spitsbergen Island  
And Siberian wasteland.  
When the opportunity arises  
To talk about the old days  
We will drink to his memory  
And his scientific glory.*

Anna Waśkowska, Jan Golonka

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