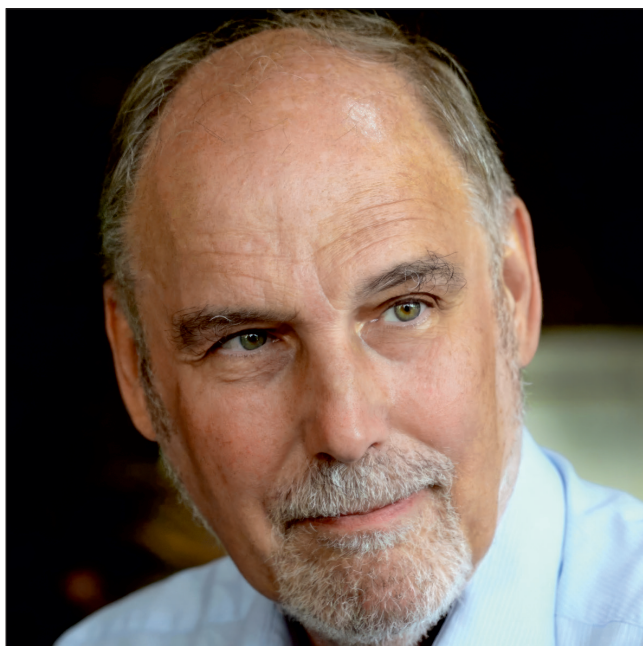


Professional path and scientific legacy of Professor Grzegorz Pieńkowski

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Grzegorz Pieńkowski at the Jurassic 2022 Congress in Budapest, Hungary

Professor Grzegorz Pieńkowski was an exceptional figure in Polish science, distinguished also in the world. To discuss his character holistically, is a task for a book-length biography, where the adventures of his personal life were intertwined with the various turns of fate of his distinguished scientific career. Below I present only his scientific path, for the sake of summarizing his achievements and recalling more than 40 years of professional work.

He graduated from the Faculty of Geology at the University of Warsaw (specializing in stratigraphic and exploration geology) with a master's degree (with honors) in 1976. His research interests initially focused on Carpathian geology, at first the Pieniny Klippen Belt. Already during his studies (as part of the activities of the student scientific association – the Association of Young Geologists), he worked out with his colleagues the profile of the Braniska and Czorszyńska Series in the Flaki section – this was the first microfacies study of the carbonate deposits of the Pieniny Mountains (Roniewicz, Pieńkowski, 1977). In turn, the subject of his master's thesis, written under the supervision of Professor Piotr Roniewicz, was trace fossils of the Podhale flysch. He presented the results of his work at the Congress of the Polish Geological Society in Zakopane (1979), and they also

resulted in publications in the *Geological Journal* (Roniewicz, Pieńkowski, 1977) and later in *Lethaia* (Pieńkowski, Westfalewicz-Mogilska, 1986). The finding of approximate synchronicity (confirmed by tuffite levels) of changes in trace fossil assemblages in relation to changes in basin living conditions provided, in addition to important paleoecological information on deep-sea crustaceans, a correlative tool with great potential for the mapping of the flysch.

These results, which are still cited in the world literature, started a research trend in his work on trace-fossils and palaeoecology. This research gradually “left” the Carpathian area and deep-sea sediments, concentrating over time on the marginal-marine and continental deposits – especially of the Jurassic age. He and his co-authors permanently introduced several ichnotaxa into the ichnological nomenclature.

After graduating in 1976, he joined doctoral studies at the Faculty of Geology of Warsaw University from 1978 to 1980. As a part of these studies, he taught (exercises, lectures, field trips) to students in the field of sedimentology. He fundamentally

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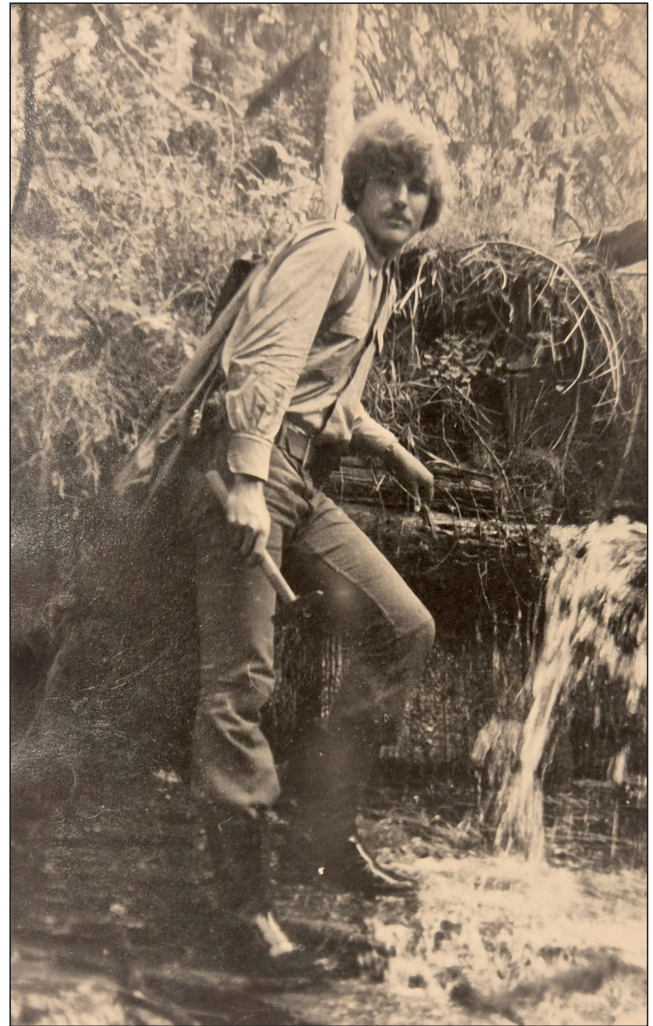
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changed both the subject matter and the research area of his work at that time. The influence of the prominent geologist, Dr. Władysław Karaszewski, was important here, although Professor Piotr Roniewicz remained his PhD supervisor. Dr. Karaszewski, an outstanding cartographer and stratigrapher, tried for many years to persuade someone from the University of Warsaw to deal with the sedimentology and facial analysis of the Lower Jurassic. He succeeded only with Grzegorz Pieńkowski, which he never regretted and always recalled that time in very good terms. The study of the Lower Jurassic series, initially in the Holy Cross Mountains region, then throughout Poland and abroad (in Sweden and in Romania) was to become the mainstream research in his scientific career. From the beginning, this was multidisciplinary research, for which sedimentology was the starting point. He introduced his own original method of comprehensive and highly accurate lithological and sedimentological description of drill cores and exposures, which became the methodological basis of all his later work.

Based on this methodology, he prepared his doctoral dissertation on the sedimentology of Hettangian and Sinemurian deposits of the northern margin of the Holy Cross Mountains, which he defended on December 14, 1981, a day after martial law in Poland was imposed. The situation was very tense at that time, and until the last moment he was not sure whether or not he would be arrested during or after the defense because of his engagement in pro-democratic opposition activity. In fact, such an order had already been issued by the communist authorities. On February 19, 1982, the Scientific Council of the Faculty of Geology at the University of Warsaw finally awarded him the degree of Doctor of Natural Sciences. Earlier that year, after completing his doctoral studies in 1980, he took a job at the Polish Geological Institute (then the Geological Institute), where he continued to study the Lower Jurassic deposits in Poland, starting also sedimentological and facies studies of the Lower Permian, Permian-Triassic boundary, and to a lesser extent Upper Triassic and Upper Jurassic. Practical aspects played an important role in this work, that is, the application of the results of his research in the search for raw materials and in the economy.

His opposition activities against communists are a topic for a separate story and it is impossible to characterize them here, even briefly. However, it cannot be separated from the troubles he faced in his professional life due to his struggle against the totalitarian system. For all this, among many others, in 2016 he received the Medal of Freedom and Solidarity from the President of the Republic of Poland, which was a worthy summation of his attitude. He can be set as a role model also in this regard.

Detailed sedimentological analyses became the starting point for more general syntheses concerning at first the correlation of transgressive-regressive trends in the epicontinental basins. In the first half of the 1980s, the methodology of sequence stratigraphy was just emerging. Grzegorz Pieńkowski's observations of marginal-marine and continental facies, where changes in relative sea level manifest themselves most clearly, but high-resolution biostratigraphy was mostly lacking, were significant in this context. In the course of his detailed sedimentological studies and facies-stratigraphic correlations, a picture of transgressive-regressive implications emerged. The latter aspect was his incentive to apply to universities in Sweden (Stockholm and Lund) with a proposal to carry out comparative studies in Scania (Skåne). This project was accepted and was funded by the Swedish National Research Fund (NFR). In 1984–1987, he was even invited as a “visiting professor” for periodic stays at the universities of Stockholm and Lund (Sweden). In the 1980s he participated in the development



In the field (probably in Pieniny), second half of 1970s

of the methodology of sequence stratigraphy. The research he conducted in Poland and Sweden became the basis for a proposal for stratigraphic-sequence correlation of the Hettangian and Sinemurian of Poland and Sweden, which he first presented at the Jurassic Symposium in Erlangen in 1984. In the early 1990s, he published the first papers in Poland on the application of the analysis and sequence stratigraphy method, introducing modifications to it, also presenting the method at lectures. In particular, two important publications in 1991 in *Sedimentology* (Pieńkowski, 1991a) and *Facies* (Pieńkowski, 1991b) with a complementary later publication in 2002 in *Geological Quarterly* (Pieńkowski, 2002) summarized this phase of work. The first two papers have been widely cited in the world literature. In the 1980s, he also continued his palaeoecological and geological research. Active participation in the First Paleocological Congress in Lyon (1983) was especially helpful. Of particular importance was his paper on continental and marginal-marine ichnofacies, in which he demonstrated a statistically significant dependence of the occurrence of certain ichnotaxa on marginal-marine paleoenvironments and their

prevailing environmental conditions (Pieńkowski, 2002). Scientific cooperation during this time was facilitated by my membership in the International Association of Sedimentologists.

His sedimentological work at the Geological Institute in the 1980s also involved the study of formations of the uppermost Permian and lowermost Triassic in the Polish Lowlands. He found that the so-called terrigenous series is bipartite – its lower part is a progradational, constituting continental fill of the residual Zechstein basin, while the upper part is a transgressive sequence, and the two parts are separated by a transgression surface that can be correlated with the global sea-level rise in the earliest Triassic. He published his results in 1991 in Poland and Germany (*Zentralblatt für Geologie und Paläontologie* (Pieńkowski, 1991c)). In the late 1980s, he also worked on the sedimentology of red bed deposits. In 1990, he made (to-



At the Institute, winter 1986

gether with Hubert Kiersnowski) a documentation of the Lower Permian of the Paproć – Cicha Góra natural gas field area (Pieńkowski, Kiersnowski, 1990). For the first time, it was found that the red-bedded sediments in this area are largely of eolian origin. The result of this interpretation was the finding of a widespread extent of eolian red bed deposits in the sedimentary basin, which had a significant impact on the gas-bearing prospects of the Lower Permian in Poland. The extensive study was given away as an archival work, as his rapid departure for a diplomatic post prevented its publication.

From 1988 to 1990 he was the head of the laboratory at the Department of Oil and Gas Deposits of the Geological Institute.

In the 1980s he also began work on dinosaur tracks. The first Polish traces of dinosaurs were described by Dr. Karaszewski more than 20 years earlier, but his discovery did not receive due recognition and did not find followers until the 1980s. In the 1980s, together with Gerard Gierliński, he described new footprints from the Lower Jurassic, and what's more, even then (Pieńkowski, Gierliński, 1987), based on the analysis of many isolated footprints, he put forward the hypothesis that some dinosaurs had the ability to swim. More than 20 years later, new, much more complete trackways from the US and Spain fully confirmed the validity of this interpretation, although the original paper (Pieńkowski, Gierliński, 1987) was not always cited by later explorers, sometimes the citations were secondary and misrepresented. This does not change the fact that his interpretation – as the first and correct one – was important for the development of knowledge about dinosaur ethology.

From 1991 to 1996 there was a break in his scientific work – which is also marked by the lack of scientific publications after 1991 until 1996, because in those years he was engaged to work for the Ministry of Foreign Affairs, which entrusted him with the mission of Consul General of the Republic of Poland in Sydney.

In 1998 he returned to scientific work at the Polish Geological Institute. Thanks to the experience acquired, at the beginning of the second period of employment at the Polish Geological Institute, he was also involved in activities of a legal and organizational nature, especially in the creation or opinion of the draft amendment of the Geological and Mining Law, including new provisions on the Polish Geological Survey. He was a co-author of the parliamentary draft amendment to the law and a number of accompanying documents and projects. In 2000–2001, he headed the Museum of the Polish Geological Institute, preparing scenarios for several temporary exhibitions. While heading the Museum, he made attempts to implement modern marketing instruments at the Institute, which also found effect in the form of publications (Pieńkowski, 2001b, c; Pieńkowski, Gierliński, 2001), and new methods of promoting science – for example, the inclusion of the popularization of paleontology in the promotion of the Disney film “Dinosaur” in 2000. Another project of this type with his participation was the assumption of scientific patronage of the network of “Juraparks” in Poland from the very beginning, also with mutual benefit; in exchange for advice and attention to the scientific correctness of paleontological reconstructions, the Institute received extensive promotion of science and PGI-NRI. Since the beginning of the 21st century, Grzegorz Pieńkowski has also been a consultant to the Jan Pazdur Ecomuseum in Starachowice and the Bałtów Jurassic Park, as well as the author of geoparks and geoconservation projects – on the subject of geodiversity protection and geotourism he has published a number of papers since 2000, the most important being the initiative and project to create the Kamienna Valley geopark.

In his scientific work, he returned to the continuation of his main research topic – the integrated stratigraphy and sedimentology of the Lower Jurassic. This research was greatly expanded to include new materials and areas, and he applied new methods (e.g., extensive palynofacial studies and geochemical methods associated with detailed sedimentological analysis). The result of this work was a monograph on the Lower Epicontinental Jurassic in Poland (Pieńkowski, 2004), which was also his habilitation dissertation, defended at Jagiellonian University in 2005. The monograph (although published in a publishing series not distinguished on the JCR/ISI list) is Grzegorz Pieńkowski’s most cited achievement. It is a comprehensive synthesis of depositional systems and paleogeography of the Lower Jurassic epicontinental series in Poland, based on detailed data, and a formal lithostratigraphic and stratigraphic-sequence division has been defined in it. The monograph became the starting point for further studies – also of an applied nature (CO₂ sequestration, exploration for clay raw materials). Together with Dr. Maria Waksmundzka, he proposed a modification in the methodology of palynofacial studies, closely integrating it with sedimentological studies and introducing new elements, what was published in *Episodes* in 2009 (Pieńkowski, Waksmundzka, 2009).

In parallel, he continued ichnological and paleoecological studies (still largely in cooperation with Gerard Gierliński and later with Grzegorz Niedźwiedzki). Most of the work of the late 1990s and the first decade of the present century was on vertebrate traces. He discovered structures that he interpreted as the first dinosaur nests in Poland (Pieńkowski, 1999). The discovery became the canvass of discussion and, unfortunately, unfunny jokes from other specialists, but years later (while Grzegorz Pieńkowski was still alive) Grzegorz Niedźwiedzki confirmed the veracity of the hypothesis with research on the synchrotron, which gave both colleagues great satisfaction. Together with Gerard Gierliński, he published a synthesis study of Hettangian tracks (Gierliński, Pieńkowski, 1999), in which great importance was especially attached to documenting and interpreting, on the basis of preserved trackways, the oldest known



Tracking Lower Triassic vertebrates in Wióry, Holy Cross Mountains, second half of 1990s

record of the herd mode of dinosaur life. They described the largest carnivorous dinosaur track in 2001 (Gierliński *et al.*, 2001), and in 2004 a comprehensive paper on Early Jurassic vertebrate (including mammalian) tracks from Sołtyków (Gierliński *et al.*, 2004) – these are widely cited papers, often in world periodicals with a high impact factor. Together with Grzegorz Niedźwiedzki, he discovered and published the first traces of pterosaurs from Poland from the tidal plain sediments of the Kimmeridgian in Wierzbica (SW margin of the Holy Cross Mts), while modifying the palaeoenvironmental interpretation of a fragment of this exposure (Pieńkowski, Niedźwiedzki, 2005). In 2009, together with M. Popa and A. Kędzior, he described the first Jurassic dinosaur tracks from Romania that he had discovered (Pieńkowski *et al.*, 2009), while contributing conclusions to the paleogeography of the area and the spread of early sauropods along the north margin of the Tethys. Continuing this collaboration, he also compiled Romanian finds of interesting vertebrate burrows (Csiki-Sava *et al.*, 2016). Paleocological studies of invertebrate traces involved poorly understood structures resulting from the life activities of bivalves, snails, annelids, and insects (Pieńkowski, Uchman, 2009; Zatoń *et al.*, 2009). He interpreted (together with J. Gutowski) the genesis of striped flints from the Upper Jurassic (Oxfordian) carbonate deposits of the Krzemionki Opatowskie neolithic flint mine as crustacean burrow fillings, together with the reconstruction of the stages of diagenesis of silica associated at an early stage also with crustacean ethology (Pieńkowski, Gutowski, 2004). The rich fossil inventory of trace invertebrates from Sołtyków was the subject of two studies: with G. Niedźwiedzki (Pieńkowski, Niedźwiedzki, 2009) in 2009 described interesting nest structures of annelids and insects, as well as a new ichnology of bivalve cavities, and with Alfred Uchman (Pieńkowski, Uchman, 2009) the diurnal rhythm of the formation of habitable cavities by freshwater bivalves according to the direction of the current, as well as the escape structures of these bivalves associated with flood episodes.

In 2006–2008, he was the supervisor of two master's theses at the University of Silesia (Anna Bujok and Grzegorz Sadlok), both on the ichnology and sedimentology of Triassic, defended with very good results in 2007. It was then that he became the supervisor of the doctoral dissertation of Paweł Brański from Polish Geological Institute – National Research Institute, which resulted in the preparation of a comprehensive monograph on the paleoclimatic, paleotectonic and raw material aspects of the Hettangian of the northern margin of the Holy Cross Mountains and the public defense of the dissertation with a positive result. He was also a reviewer in the postdoctoral dissertations of Dr. Anna Wysocka of the Faculty of Geology at the University of Warsaw (2009; the dissertation was on the sedimentology of Neogene deposits in Vietnam) and Dr. Jolanta Paczeńska of PIG-PIB (2011; the dissertation was on the sedimentology of Ediacaran and lowermost Cambrian of southeastern Poland).

He dealt with the Lower and Upper Triassic rocks in terms of modern sedimentological and sequence analysis in 2000–2002 as part of a major National Science Center project. He was the main author of the study of the rich Upper Triassic materials, which later allowed him to undertake a large monograph of this system, which was the Stratigraphic Table of Poland (Carpathian and extra-Carpathian, Becker *et al.*, 2008). In the Epicontinental (extra-Carpathian) Table, he worked out the Lower Jurassic in their entirety. After the submission of this monograph (the third of this kind in Europe), he was among the team of a dozen or so main authors of the Table, recognized for this work in 2008 with an award from the Ministry of the Environment.

Over the past 20 years, he has participated in many national and international conferences and symposia, the most important being the 7th World Jurassic Congress in 2006 and the 2nd World Ichnological Congress “*Ichnia*” (2008). Both congresses were held in Cracow, and in both he played an active role as a member of the organizing committees. He also actively participated by presenting papers and leading sessions in three international symposia of the IGCP 506 project (Bristol, Hammamet, Bucharest). Publications and scientific activity in Poland and abroad made him a member of the board of directors of the Polish Jurassic System Working Group, joined by colleagues from Slovakia, the Czech Republic, Ukraine and Hungary, as well as (from 2005 to 2010) leader of IGCP Project 506 “Marine and Non-marine Jurassic: Global Correlation and Major Geological Events”. Co-authored annual reports for IUGS (International Union of Geological Science) and UNDP (UN Development Agenda). The 2010 report of the Polish IGCP National Committee (the final year of the project) lists the IGCP 506 project as the only one in which the leader was from Poland, and the substantive report of the National Committee mostly deals with the achievements of this particular project.

In 2007–2008, he co-coordinated (with Michael Schudack of Berlin) a comprehensive chapter in the monumental work *Geology of Central Europe* (Editor-in-Chief: Tom McCann) on the *Jurassic* system in eleven European countries (Pieńkowski *et al.*, 2008). This chapter is a comprehensive monograph in itself (100 pages, dozens of synthetic figures).

In his scientific activities, he attached great importance to the exchange of ideas and scientific discussion, which also repeatedly resulted in successful collaborations of a multidisciplinary nature and joint publications. He has presented dozens of scientific papers at congresses and symposia.

Since 2006, he has been a corresponding member of ISJS (International Subcommittee on Jurassic Stratigraphy), becoming a full commission member in 2013, and was vice-Chair from 2016 onwards. Through 2006–2009 he was a member

(*voting* member) of the team deciding on the Hettangian GSSP (Global Boundary Stratotype Section and Point) being a base of the Jurassic system at the same time. In addition, he prepared numerous reviews for Polish geological periodicals and reviewed articles for well-known international journals.

In 2009–2010 he played a key role in maintaining and reactivating in a new form the periodical *Volumina Jurassica*, which since 2010 has been the official scientific journal of ISJS (International Subcommission on Jurassic Stratigraphy). He was co-editor of this journal, in addition, he served on the editorial boards of *Geological Quarterly* and *Geological Review*.

In recent years, he has been involved in projects of great importance in the dimension of energy and strategic security. From April 2005 to January 2007, he was the manager of the international NATO-SPS project on the storage of hydrocarbons in salt structures and the pro-ecological use of the resulting brine. The substantive results of the project were summarized in a report submitted to NATO Headquarters in Brussels and the Ministry of National Defense in Poland, and in two publications in *Geological Review*. It was an important project for NATO allies, while addressing energy security and defense issues for Poland. Among other things, it confirmed the possibility of storing logistic fuels in salts in a safe manner, including fuel for F-16 fighter jets, and identified possible locations for such storage facilities, as well as logistic concepts for the supply and storage of strategic hydrocarbon reserves. His original contribution to the project was the concept of environmentally friendly use of large quantities of waste brine generated during cavern leaching. This concept may still be used if the large-capacity cavern construction program goes ahead. As a result of his scientific achievements and activities, in 2012 he was awarded by the President of Poland the title of professor of earth sciences, the highest title in the national science system.

Of great importance is his cooperation with the Department of Geology at Oxford University (Prof. Stephen Hesselbo). They continued joint research projects on sedimentology, chemostratigraphy, palaeoclimatology of Lower Jurassic formations in Europe, the fruit of this cooperation so far is a publication on chemostratigraphy, paleogeography and paleoclimate in the early Toarcian anoxic event (Pieńkowski *et al.*, 2016, 2020; Barth *et al.*, 2018; Ruebsam *et al.*, 2020). They have applied new methods to evaluate these changes not only in the oceanic system, but also in the atmospheric system. They also built a larger team to comprehensively study the Lower Jurassic series using high-resolution stratigraphic correlation methods, which work will be important for CCS projects in Europe.

In 2007–2008, and 2021–2022 he was a member of the Scientific Council of PGI-NRI and chairman of the Council's Team for periodic evaluation of the scientific and technical achievements of the Institute's employees employed as assistant professors, assistants and in research and technical positions. From 2008 to 2015, he took several positions as Deputy Director of PGI-PIG for International Cooperation Affairs, Scientific Director and Scientific Secretary of PGI-NRI. He has collaborated with several scientific centers abroad, currently primarily with Oxford University, BGR (German Federal Geological Survey) and the University of Bucharest.

The scale and potential of the scientific projects initiated by Prof. Pieńkowski are evidenced by their continuous publication almost to the present day. An example is the very recent publication (Qvarnström *et al.*, 2024) on the evolution of dinosaurs. The material collected over the last quarter of a century, included nearly 500 fossils, which have been studied using a variety of methods, both the more traditional methods, such as thin sections and palynomorph analysis, as well as X-ray imaging of the specimens using the synchrotron in Grenoble and 3D imaging of the contents of the objects. The vast majority of the material studied came from Poland, from the Holy Cross Mountains and Silesia. On the basis of the analysis of the content of fossilised faeces from dinosaurs and mammal-like reptiles, among others, it was determined that the opportunism of early dinosaur representatives proved to be the key to survival and their success. Professor Pieńkowski initiated research on the Lower Jurassic and dinosaurs in Poland back in the 1980s and carried it out to the very end, and his material and observations have largely contributed to the current success of Polish geology, in the form of such an important publication.

His latest discovery was directly related to the beginning of his great career: trace fossils and dinosaurs. Finding a magnificent Lower Jurassic site in Borkowice with thousands of dinosaur tracks and bones, he planned large-scale research (Pieńkowski, Niedźwiedzki, 2021). With his unparalleled ability to tell an interesting story about the dawn of dinosaurs and the need for their research, he won the support of many people and was in Borkowice with his thoughts until the very end.

During our last conversation, a few hours before his untimely passing, we planned further exploration expeditions and formal steps necessary to protect this unique site. Grzegorz, I promise not to disappoint the commitment and hopes associated with your last project.

Professor Grzegorz Pieńkowski was a key member of an international team working towards an integrated understanding of the Early Jurassic timescale and Earth system (the JET project) – work that is still ongoing. I first met Gregory when he visited the Department of Geology and Mineralogy at the University of Oxford in the early 1990's when he was first developing his integrated stratigraphy for the Lower Jurassic of Scania and Poland, eventually realized in his 2004 monograph on the Polish Lower Jurassic (Pieńkowski, 2004). As one of the reviewers of that work, I was immensely impressed by its scope and comprehensiveness, and that initial contact led to a very fruitful collaboration that spanned a couple of decades. As Piotr Szrek has written above, Gregory's scientific work was characterized by both attention to detail and also bold and imaginative interpretations, and his synthesis of the Polish Lower Jurassic was no different. This work took a range of outcrop and borehole data and proposed a synthesis based on a facies and sequence stratigraphic model that made precise and detailed predictions about the basin architecture and geological ages for the whole Lower Jurassic basin fill. At the time it was produced these hypotheses remained largely untested and many colleagues were sceptical that they were correct. Later work suggested by Gregory included the generation of carbon-isotope data from woody phytoclast debris to identify how the Early Toarcian Oceanic Anoxic Event – one the largest environmental change events in the Phanerozoic – might have been expressed in the largely non-marine Polish Basin. On the basis of his sequence stratigraphic scheme he selected a series of samples from legacy cores that he conjectured would represent the event, and on the basis of the data generated it turned out that he was exactly correct in all his sample selections, the results published in Hesselbo, Pieńkowski, 2011.

Gregory attended a workshop in Oxford in March 2013 funded by the International Continental Scientific Drilling Program (ICDP), aimed at developing a large-scale programme to improve our knowledge and understanding of Early Jurassic global change (impressively forgiving when we left him stranded at an out-of-town bus stop prior to the pre-workshop field excursion). The principal focus of the workshop was on redrilling a long continuous marine record originally cored in the late 1960's at Mochras in NW Wales. Gregory's insightful contributions to that workshop were crucial to the eventual success of the proposal, and as part of the overall programme he suggested further parallel work on a remarkable >700 m thick core of the Lower Jurassic from of the Kaszewy borehole in the Polish Trough, the results from which were published in Pieńkowski *et al.* (2020). Yet again, Gregory pushed some bold claims in this paper, suggesting a semi-quantitative relationship between the carbon-isotope composition of woody phytoclasts and palaeotemperature, building on previous work which indicated a correlation between total organic matter content and phytoclast carbon-isotope values due to fungally mediated palaeoclimatic effects in the Polish Basin non-marine and marginal marine settings during the Toarcian event (Pieńkowski *et al.*, 2016). These interpretations were so unconventional, that one of our esteemed colleagues declared that Gregory was either a genius or a madman, possibly both!

For logistical and financial reasons the JET borehole location had to be changed from Mochras to Prees in NW England. In the meantime, Gregory together with Alfred Uchman were successful in obtaining a grant to carry out work on the original Mochras core materials. Analyses comprised detailed core descriptions of the sedimentology and ichnology of core slabs from the two upper stages of the Lower Jurassic (Pieńkowski *et al.*, 2021, 2024; Ninard *et al.*, this volume) as well as work on detrital zircon ages. Insights provided by their work have been quite transformative, and include the realization that unlike much of the NW European Lower Jurassic mudstone succession, the Mochras strata were deposited below storm wave base and show characteristics typically associated with contourite deposits. Furthermore, the cyclic organization of the trace fossils and facies can be interpreted in terms of Milankovitch cycles in a manner that challenges results from other more statistical methodologies. Results of this work are still feeding through into formulation of a robust timescale for this interval of the geological column.

Due to the Covid pandemic and travel restrictions, Gregory was unable to spend time at the Prees drillsite when drilling of the ICDP borehole was completed in 2021. Nevertheless, he and Alfred were able later to undertake a similar detailed study on the new core as they had done at Mochras, and results from this work will be realized in the future. In this way and many others Gregory's monumental scientific legacy lives on.

Stephen P. Hesselbo

Acknowledgments. We thank the professor's family, Sylwia, Aleksandra and Maurycy for sharing photos from their private archive.

REFERENCES

SCIENTIFIC, PEER-REVIEWED ARTICLES:

- RONIEWICZ P., PIENKOWSKI G., 1977 – Trace fossils of the Podhale Flysch Basin (Eds. T.P. Crimes, J.C. Harper). Seel House Press, Liverpool. *Geological Journal*, Special Issue 9: 273–288.
- KASIŃSKI J.R., PIENKOWSKI G., PISERA A. 1981 – Lithological and microfacial characteristics of the Braniska and Czorsztyn units along the Krosnica – Kały road in the Pieniny Mountains. Charakterystyka litologiczno-mikrofacjalna jednostek braniskiej i czorsztynskiej wzdłuż drogi Krośnica – Kały w Pieninach. *Studia Geologica Polonica*, 70: 73–94 [in Polish].
- PIENKOWSKI G., 1983 – Sedimentary environments of the Lower Lias of the northern margin of the Holy Cross Mountains. Środowiska sedymentacyjne dolnego liasu północnego obrzeżenia Gór Świętokrzyskich. *Przegląd Geologiczny*, 4: 223–230 [in Polish].
- PIENKOWSKI G., 1984 – Facies and event correlations in the Polish Lower Jurassic – some contributions to the stratigraphy of marine-margin and non-marine deposits. Symposium Volume I, First International Symposium on Jurassic Stratigraphy, Erlangen, 1984: 267–278. Copenhagen.
- PIENKOWSKI G., 1985 – Early Liassic Trace Fossils Assemblages from the Holy Cross Mountains, Poland: Their Distribution in Continental and Marginal Marine Environments. *Society of Economic Paleontologists and Mineralogists, Special Publication* (Ed. H. Allen Curran), 35: 37–52. Tulsa (special issue of the *Journal of Sedimentary Petrology*).
- PIENKOWSKI G., WESTWAŁEWICZ-MOGILSKA E., 1986 – Trace fossils from the Podhale Flysch Basin, Poland – an example of ecologically-based lithocorrelation. *Lethaia*, 19, 1: 53–65.
- PIENKOWSKI G., GIERLIŃSKI G., 1987 – New finds of dinosaur footprints in Liassic of the Holy Cross Mountains and its palaeoenvironmental background. *Przegląd Geologiczny*, 4: 199–205.
- PIENKOWSKI G., 1988a – Sedimentation characteristics of the uppermost Zechstein and the lowermost Pstry sandstone sediments). Charakterystyka sedymentacji osadów najwyższego cechsztynu i najniższego pstręgo piaskowca. Profile Głębokich Otworów Wiertniczych IG, Zeszyt 65, otwory Mszczonów IG 1, Mszczonów IG 2, Nadarzyn IG 1 (Eds. J. Dembowska, S. Marek) [in Polish].
- PIENKOWSKI G., 1988b – Facies analysis of the uppermost Triassic and Liassic of the Kraków–Wielun Upland and prospects for the occurrence of clay raw materials. Analiza facjalna najwyższego triasu i liasu Wyżyny Krakowsko-Wieluńskiej oraz perspektywy występowania surowców ilastych. *Przegląd Geologiczny*, 8: 449–456 [in Polish].
- PIENKOWSKI G., 1989 – Facies criteria for delimitating Zechstein/Buntsandstein and Permian/Triassic boundaries in Poland. Sedymentologiczne kryteria wyróżniania granicy cechsztyń/pstry piaskowiec oraz perm/trias w Polsce. *Przegląd Geologiczny*, 5: 237–247 [in Polish].
- PIENKOWSKI G., 1991a – Eustatically-controlled sedimentation in the Hettangian–Sinemurian (Early Jurassic) of Poland and Sweden. *Sedimentology*, 38: 503–518.
- PIENKOWSKI G., 1991b – Liassic Sedimentation in Scania, Southern Sweden: Hettangian–Sinemurian of the Helsingborg Area. *Facies*, 24: 39–86.
- PIENKOWSKI G., 1991c – Facies criteria for delimitating Zechstein/Buntsandstein and Permian/Triassic boundaries in Poland. *Zentralblatt für Geologie Palaontologie*, Teil I, 4: 892–912.
- PIENKOWSKI G., 1997 – Lower Jurassic: Sedimentology and sequence stratigraphy based on selected profiles. Jura dolna: Sedymentologia i stratygrafia sekwencji na podstawie wybranych profilów. W: Epikontynentalny perm i mezozoik w Polsce (Eds. S. Marek, M. Pajchłowa). *Prace Państwowego Instytutu Geologicznego*, 153: 217–235 [in Polish with English summary].
- PIENKOWSKI G., 1998 – Dinosaur nesting ground from the Early Jurassic fluvial deposits, Holy Cross Mountains, Poland. *Geological Quarterly*, 42, 4: 461–476.
- GIERLIŃSKI G., PIENKOWSKI G., 1999 – Dinosaur track assemblages from the Hettangian of Poland. *Geological Quarterly*, 43, 3: 329–341.
- PIENKOWSKI G., 1999 – Dinosaur nesting ground from the Early Jurassic fluvial deposits, Holy Cross Mountains (Poland) – reply and new evidence. *Geological Quarterly*, 43, 3: 379–381.
- GIERLIŃSKI G., NIEDŹWIEDZKI G., PIENKOWSKI G., 2001a – Gigantic footprint of a theropod dinosaur in the Early Jurassic of Poland. *Acta Palaeontologica Polonica*, 46, 3: 441–446.
- GIERLIŃSKI G., GAŹDZICKA E., NIEDŹWIEDZKI G., PIENKOWSKI G., 2001b – New ornithischian dinosaur footprints in the Jurassic of Poland. *Geological Quarterly*, 45, 2: 205–210.
- PIENKOWSKI G., 2002 – Lithofacies and palaeoenvironmental interpretation of the Early Jurassic Höör Sandstone, Southern Sweden. *Geological Quarterly*, 46, 3: 307–320.
- GIERLIŃSKI G., PIENKOWSKI G., NIEDŹWIEDZKI G., 2004 – Tetrapod track assemblage in the Hettangian of Sołtyków, Poland, and its paleoenvironmental background. *Ichnos*, 11, 34: 195–213.
- NIEDŹWIEDZKI G., PIENKOWSKI G., 2004 – A dinosaur track association from the Early Jurassic deltaic deposits of Podole near Opatów, Poland. *Geological Quarterly*, 48, 4: 333–338.
- PIENKOWSKI G., 2004a – Sołtyków – a unique paleoecological record of Early Jurassic continental sediments. Sołtyków – unikalny zapis paleoekologiczny wczesnojurajskich utworów kontynentalnych. *Tomy Jurajskie (Volumina Jurassica)*, 2: 137–152 [in Polish with English summary].

- PIEŃKOWSKI G., 2004b – Depositional architecture of parasequences in marginal marine sediments. Architektura depozycyjna parasekwencji w utworach marginalno-morskich. *Tomy Jurajskie (Volumina Jurassica)*, **2**: 161 [in Polish with English summary].
- PIEŃKOWSKI G., GUTOWSKI J., 2004 – Genesis of the Upper Oxfordian flints in the Krzemionki Opatowskie. Geneza krzemieni górnego oksfordu w Krzemionkach Opatowskich. *Tomy Jurajskie (Volumina Jurassica)*, **2**: 101–108 [in Polish with English summary].
- PIEŃKOWSKI G., 2005 – Magazynowanie ropy i produktów naftowych w strukturach solnych, projekt NATO-CCMS. Subsurface storage of petroleum in salt structures NATO-CCMS Project. *Technika Poszukiwań Geologicznych*, **45**: 77–79.
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2005 – Pterosaur tracks from the early Kimmeridgian intertidal deposits of Wierzbica, Poland. *Geological Quarterly*, **49**, 3: 339–346.
- SHA J., MORTON N., WANG Y., OLSEN P., PIEŃKOWSKI G., WIMBLETON W.A.P., RICCARDI A.C., 2006 – Marine and Non-marine Jurassic: Boundary Events and Correlation. *Progress in Natural Science*, **16** (Special Issue): 1–6.
- JASKOWIAK-SCHOENEICHOVA M., JAWOROWSKI K., KRYSKIEWICZ E., LENDZION K., LESZCZYŃSKI K., MODLIŃSKI Z., PACZEŚNA J., PIEŃKOWSKI G., POKORSKI J., SZYPERKO-TELLER A., WAGNER R., 2007 – Triassic: Lithological and stratigraphic profile. Trias: Profil litologiczno-stratygraficzny. *Profil Głębokich Otworów Wiertniczych PIG*, **116** Słupsk IG 1: 11–36 [in Polish].
- PIEŃKOWSKI G., 2007a – Results of stratigraphic and lithological studies. Triassic. Wyniki badań stratygraficznych i litologicznych. Trias. *Profil Głębokich Otworów Wiertniczych PIG*, **116** Słupsk IG 1: 62–63 [in Polish].
- PIEŃKOWSKI G., 2007b – Results of lithological-stratigraphic and sedimentological studies. Perm. Sedimentological profile of the Permian/Triassic boundary interval. Wyniki badań litologiczno-stratygraficznych i sedimentologicznych. Perm. Profil sedimentologiczny interwału granicznego perm/trias. *Profil Głębokich Otworów Wiertniczych PIG*, **121** Piotrków Trybunalski IG 1: 36–39 [in Polish].
- PIEŃKOWSKI G., 2009 – Podziemne magazynowanie węglowodorów w kavernach solnych w Polsce – wymiar strategiczny i możliwości poprawy stanu środowiska naturalnego. Storage of hydrocarbons in salt caverns – strategic significance and the use of salt brine as a medium for improvement of environment. *Przegląd Geologiczny*, **57**, 9: 791–797.
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2009 – Invertebrate trace fossil assemblages from the Lower Hettangian of Sołtyków, Holy Cross Mountains, Poland. *Volumina Jurassica*, **6**: 109–131 [Proceedings of the 7th International Congress on the Jurassic System. Kraków, Poland, September 6–18, 2006].
- PIEŃKOWSKI G., UCHMAN A., 2009 – *Ptychoplasma conica* isp. nov. – a new bivalve locomotion trace fossil from the Lower Jurassic (Hettangian) alluvial sediments of Sołtyków, Holy Cross Mountains, Poland. *Geological Quarterly*, **53**, 4: 397–406.
- PIEŃKOWSKI G., WAKSMUNDZKA M., 2009 – Palynofacies in Lower Jurassic epicontinental deposits of Poland: Tool to interpret sedimentary environments. *Episodes*, **32**, 1: 21–32.
- PIEŃKOWSKI G., POPA M.E., KĘDZIOR A., 2009 – Early Jurassic sauropod footprints of the Southern Carpathians, Romania: Palaeobiological and palaeogeographical significance. *Geological Quarterly*, **53**, 4: 461–470.
- ZATOŃ M., NIEDŹWIEDZKI G., PIEŃKOWSKI G., 2009 – Gastropod egg capsules preserved on bivalve shells from the Lower Jurassic (Hettangian) of Poland. *Palaios*, **24**, 9/10: 568–577.
- KĘDZIOR A., POPA M.E., PIEŃKOWSKI G., 2010 – Evidences of Vertebrate Activity Recorded in the Lower Jurassic Continental Deposits of the Steierdorf Formation, SW Romania. *Earth Science Frontiers*, **17** (Special Issue): 258–259.
- HESELBO S.P., PIEŃKOWSKI G., 2011 – Stepwise atmospheric Carbon Isotope excursion during the Early Jurassic oceanic anoxic event. *Earth and Planetary Science Letters*, **301**, 1/2: 365–372.
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., WAKSMUNDZKA M., 2012 – Sedimentological, palynological and geochemical studies of the terrestrial Triassic-Jurassic boundary in northwestern Poland. *Geological Magazine*, **149**: 308–332.
- MARCINKIEWICZ T., FIJAŁKOWSKA-MADER A., PIEŃKOWSKI G., 2014 – Megaspore zones of the epicontinental Triassic and Jurassic deposits in Poland 0 Overview. Poziomy megasporowe epikontynentalnych utworów triasu i jury w Polsce – podsumowanie. *Biuletyn Państwowego Instytutu Geologicznego*, **457**: 15–42. doi: 10.5604/08676143.1113255.
- PIEŃKOWSKI G., 2014 – Sedimentological profile of the pre-Callovia (Jurassic) siliciclastic deposits in the Cianowice 2 borehole (near Kraków, Poland). Profil sedimentologiczny przedkelowejskich (jurajskich) utworów silikoklastycznych w otworze badawczym Cianowice 2 (okolice Krakowa). *Biuletyn Państwowego Instytutu Geologicznego*, **459**: 147–156. doi: 10.5604/08676143.1113174.
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., BRAŃSKI P., 2014 – Climatic reversals related to the Central Atlantic magmatic province caused the end-Triassic biotic crisis–Evidence from continental strata in Poland. *Volcanism, Impacts, and Mass Extinctions: Causes and Effects*, **505**: 263–286, doi: 10.1130/2014.2505(13).
- PIEŃKOWSKI G., BRAŃSKI P., PANDEY D.K., SCHLOGL J., ALBERTI M., FURSICH F.T., 2015 – Dinosaur footprints from the Thaiat ridge and their palaeoenvironmental background, Jaisalmer Basin, Rajasthan, India. *Volumina Jurassica*, **13**, 1: 17–26.
- BARBACKA M., PACYNA G., PIEŃKOWSKI G., ZIAJA J., 2016 – New data about *Matonia braunii* (Göppert) Harris from the Early Jurassic of Poland and its ecology. *Geological Quarterly*, **60**, 4: 857–868, doi: 10.7306/gq.1322.
- CSIKI-SAVA Z., KĘDZIOR A., PIEŃKOWSKI G., POPA M.E., 2016 – Hettangian tetrapod burrows from the continental Steierdorf Formation at Anina, western Romania. *Geological Quarterly*, **60**, 2: 395–406, doi: 10.7306/gq.1278.
- NIEDŹWIEDZKI G., PIEŃKOWSKI G., 2016 – A dinosaur track assemblage from the Upper Hettangian (Lower Jurassic) marginal-marine deposits of Zapniów, Holy Cross Mountains, Poland. *Geological Quarterly*, **60**, 4: 840–856.
- PIEŃKOWSKI G., HODBOD M., ULLMANN C.V., 2016 – Fungal decomposition of terrestrial organic matter accelerated Early Jurassic climate warming. *Scientific Reports*, **6**, 31930; doi: 10.1038/srep31930.

- BARTH G., PIENKOWSKI G., ZIMMERMANN J., FRANZ M., KUHLMANN G., 2018 – Palaeogeographical evolution of the Lower Jurassic: High-resolution biostratigraphy and sequence stratigraphy in the Central European Basin. *Geological Society Special Publication*, **469**, 1: 341–369, doi: 10.1144/SP469.8.
- ELGH E., PIENKOWSKI G., NIEDŹWIEDZKI G., 2019 – Pterosaur track assemblages from the Upper Jurassic (lower Kimmeridgian) intertidal deposits of Poland: Linking ichnites to potential trackmakers. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **530**: 32–48.
- PIENKOWSKI G., MARTINI M., ZEPEDA-MARTÍNEZ. M., 2019 – Bajocian transgressive-regressive sequences of the Tecocoyunca Group, southern Mexico, with maximum flooding surfaces marked by *Thalassinoides*. *Geological Quarterly*, **63**, 3: 449–459, doi: 10.7306/gq.1480.
- PIENKOWSKI G., HESSELBO S.P., BARBACKA M., LENG M.J., 2020 – Non-marine carbon-isotope stratigraphy of the Triassic-Jurassic transition in the Polish Basin and its relationships to organic carbon preservation, pCO₂ and palaeotemperature. *Earth-Science Reviews*, **210**: 103383.
- RUEBSAM W., PIENKOWSKI G., SCHWARK L., 2020 – Toarcian climate and carbon cycle perturbations – its impact on sea-level changes, enhanced mobilization and oxidation of fossil organic matter. *Earth and Planetary Science Letters*, **546**: 116417, doi: 10.1016/j.epsl.2020.116417.
- PIENKOWSKI G., UCHMAN A., NINARD K., HESSELBO S.P., 2021 – Ichnology, sedimentology, and orbital cycles in the hemipelagic Early Jurassic Laurasian Seaway (Pliensbachian, Cardigan Bay Basin, UK). *Global and Planetary Change*, **207**, doi: 10.1016/j.gloplacha.2021.103648.
- BARBACKA M., GÓRECKI A., PACYNA G., PIENKOWSKI G., PHILIPPE M., BÓKA K., ZIAJA J., JARZYŃKA A., QVARNSTRÖM M., NIEDŹWIEDZKI G., 2022 – Early Jurassic coprolites: insights into palaeobotany and the feeding behaviour of dinosaurs. *Papers in Palaeontology*, **8**, 2: e1425, doi: 10.1002/spp2.1425.
- MENNING M., PIENKOWSKI G., KÄDING K.C., MALETZ J., KEMNITZ H., KRAMER W., BITTMANN F., HOSELMANN C., JANSSEN R., HEGGEMANN H., HISS M., NITSCH E. 2022 – Corrections and supplements on the Stratigraphic Table of Germany 2016 (STG 2016). *Zeitschrift der Deutschen Gesellschaft für Geowissenschaften*, **173**, 1: 161–166, doi: 10.1127/zdgg/2020/0228.
- MIKULSKI S., BRAŃSKI P., PIENKOWSKI G., MALEK R., ZGLINICKI K., CHMIELEWSKI A., 2022 – REE enrichment of Mesozoic sedimentary formations (regoliths, paleosols and phosphorites) in southern Poland. 16th SGA Biennial Meeting, 2022, 1.
- PACYNA G., ZIAJA J., BARBACKA M., PIENKOWSKI G., JARZYŃKA A., NIEDŹWIEDZKI G., 2022 – Early Jurassic dinosaur-dominated track assemblages, floristic and environmental changes in the Holy Cross Mountains region, Poland. *Geological Quarterly*, **66**: 29, doi: 10.7306/gq.1660.
- HESSELBO S.P. *et al.*, 2023 – Initial results of coring at Prees, Cheshire Basin, UK (ICDP JET project): Towards an integrated stratigraphy, timescale, and Earth system understanding for the Early Jurassic. *Scientific Drilling*, **32**: 1–25, doi: 10.5194/sd-32-1-2023.
- PIENKOWSKI G., UCHMAN A., NINARD K., PAGE K.N., HESSELBO S.P., 2024 – Early Jurassic extrinsic solar system dynamics versus intrinsic Earth processes: Toarcian sedimentation and benthic life in deep-sea contourite drift facies, Cardigan Bay Basin, UK. *Progress in Earth and Planetary Science*, **11**, 1, doi: 10.1186/s40645-024-00612-3.
- QVARNSTRÖM M., VIKBERG WERNSTRÖM J., WAWRZYŃIAK Z., BARBACKA M., PACYNA G., GÓRECKI A., ZIAJA J., JARZYŃKA A., OWOCKI K., SULEJ T., MARYNOWSKI L., PIENKOWSKI G., AHLBERG P., NIEDŹWIEDZKI G., 2024 – Digestive contents and food webs record the advent of dinosaur supremacy. *Nature*, **636**: 397–403. doi: 10.1038/s41586-024-08265-4.

MONOGRAPHS

- PIENKOWSKI G., 2004 – The epicontinental Lower Jurassic of Poland. *Polish Geological Institute Special Papers*, **12**.
- WIERZBOWSKI A., AUBRECHT A., GOŁONKA J., GUTOWSKI J., KROBICKI M., MATYJA B.A., PIENKOWSKI G., UCHMAN A., 2006 – Jurassic of Poland and adjacent Slovakian Carpathians. Field trip guidebook of 7th International Congress on the Jurassic System. Poland, Kraków, September 6–18, 2006.
- BECKER A., BER A., BUŁA Z., CYMERMAN Z., DADLEZ R., FELDMAN-OLSZEWSKA A., GÓRECKA-NOWAK A., HAYDUKIEWICZ J., JACHOWICZ M., JAWOROWSKI K., JURECZKA J., KARNKOWSKI P., KASIŃSKI J. R., KIERSNOWSKI H., KOPIK J., KOWALCZEWSKI Z., KRZEMIŃSKA E., KULETA M., LINDNER L., MARCINOWSKI R., MAREK S., MARKS L., MATYJA B.A., MATYJA H., MIŁACZEWSKI L., MODLIŃSKI Z., NARKIEWICZ K., NARKIEWICZ M., NAWROCKI J., NOWAK J. G., OSZCZYPKO N., PIENKOWSKI G., PIWOCKI M., POKORSKI J., RACKI G., SKOMPSKI S., SZCZEPANIK Z., SZULC J., SZULCZEWSKI M., SZYMAŃSKI B., TELLER L., TRELA W., WAGNER R., WAKSMUNDZKA M.I., WALASZCZYK I., WISZNIEWSKA J., ZDANOWSKI A., ŻYLIŃSKA A., 2008 – Stratigraphic Chart of Poland – Extra-Carpathian Poland. Tabela stratygraficzna Polski – Polska pozakarpaska. Ministerstwo Środowiska.
- PIENKOWSKI G., UCHMAN A., 2008 – Ichnological sites of Poland: The Holy Cross Mountains and the Carpathian Flysch: the Pre-Congress and Post-Congress Field Trip Guidebook The Second International Congress on Ichnology. Cracow, Poland, August 29 – September 8, 2008.
- PIENKOWSKI G., SCHUDACK M.I. (coordinators), LEINFELDER R.E., BOSÁK P., ENAY R., FELDMAN-OLSZEWSKA A., GOŁONKA J., GUTOWSKI J., HERNGREEN G.F.W., JORDAN P., KROBICKI M., LATHUILIÈRE B., MICHALÍK J.,

MÖNNIG E., NOE-NYGAARD N., PÁLFY J., PINT A., RASSER M.W., REISDORF A.G., SURLYK F., WETZEL A., WONG T.E., 2008 – Jurassic. *In: The Geology of Central Europe. Vol. 2: Mesozoic and Cenozoic* (Ed. T. McCann). The Geological Society, London: Special Publication: 823–922.

BOCHEN A., PIENKOWSKI G., 2009 – Polish gas industry: An album prepared under the auspices of the Chamber of Commerce of Gas Industry. *Gazownictwo polskie: album przygotowany pod patronatem Izby Gospodarczej Gazownictwa*. Polish Gas Industry [in Polish].

INTERNATIONAL CONGRESS MATERIALS AND GUIDES, NON-REVIEWED NEWS/POLEMICAL ARTICLES, CONFERENCE PAPERS

- PIENKOWSKI G., 1979 – (Route B12 – Podhale). Trasa B12 – Podhale. Przewodnik wycieczkowy 51. Zjazdu Naukowego Polskiego Towarzystwa Geologicznego, Zakopane.
- PIENKOWSKI G., 1987 – Facies criteria in delimitating Zechstein/Buntsandstein and Permian/Triassic boundaries in Poland. *International Symposium Zechstein, 1987, Kassel-Hannover, Proceedings*.
- KRZYWIEC P., NAWROCKI J., KIERSNOWSKI H., SZULC J., PIENKOWSKI G., WYSOCKA A., FELDMAN-OLSZEWSKA A., IWANOW A., DADLEZ R., SZEWCZYK J., 2000 – Evolution of the Polish Triassic basin – Integrated approach. 31. *International Geological Congress, Rio de Janeiro, 6–17 August 2000. Abstract Volume*.
- PIENKOWSKI G., 2001a – Lower Jurassic depositional sequences in extra-Carpathian Poland. *Dolnojurajskie sekwencje depozycyjne w Polsce pozakarpackiej. JURASSICA. Polska Grupa Robocza Systemu Jurajskiego. II Spotkanie. Starachowice, 27–29.09.2001. PIG-PIB: 22–25 [in Polish]*.
- PIENKOWSKI G., 2001b – Concept for the Exposition of the Polish Mesozoic (Triassic and Jurassic) Park at the Blast Furnace Complex in Starachowice. *Traditions and Perspectives of the Blast Furnace Complex in Starachowice, Materials of the Scientific Conference. Koncepcja ekspozycji polskiego parku mezozoicznego (triasowego i jurajskiego) w Zespole Wielkopiecowym w Starachowicach. Tradycje i Perspektywy Zespołu Wielkopiecowego w Starachowicach. Materiały Konferencji Naukowej* (Eds. I. Suliga, M. Karbowniczek). Starachowice: 97–98 [in Polish].
- PIENKOWSKI G., 2001c – Marketing in research and development units on the example of the National Geological Institute. *Marketing w jednostkach badawczo-rozwojowych na przykładzie Państwowego Instytutu Geologicznego. Posiedzenia Naukowe Państwowego Instytutu Geologicznego, 57: 24 [in Polish]*.
- PIENKOWSKI G., GIERLIŃSKI G., 2001 – Traces of dinosaurs and other monuments of inanimate nature an opportunity for tourism development in the Holy Cross Mountains region. *Ślady dinozaurów i inne zabytki przyrody nieożywionej szansą dla rozwoju turystyki w regionie świętokrzyskim. Tradycje i Perspektywy Zespołu Wielkopiecowego w Starachowicach. Materiały Konferencji Naukowej* (Eds. I. Suliga, M. Karbowniczek). Starachowice: 99–101 [in Polish].
- KRZYWIEC P., DADLEZ R., IWANOW A., KIERSNOWSKI H., KRÓLIKOWSKI C., FELDMAN-OLSZEWSKA A., NARKIEWICZ K., NAWROCKI J., PETECKI Z., PIENKOWSKI G., ROMAN A., SZEWCZYK J., SZULC J., WYSOCKA A. 2002 – Integrated geophysical-geological analysis of the Triassic basin of the Polish lowlands session summarizing the results of the grant. *Zintegrowana analiza geofizyczno-geologiczna basenu triasowego niżu polskiego sesja podsumowująca wyniki grantu KBN nr 9T12B02415. Posiedzenia Naukowe Państwowego Instytutu Geologicznego, 58: 28–29 [in Polish]*.
- PIENKOWSKI G., 2002 – Jurassica II. *Konferencja Polskiej Grupy Roboczej Systemu Jurajskiego Polskiego Towarzystwa Geologicznego. Starachowice, 27–29.09.2001. Jurassica II Conference of the Polish Working Group, Jurassic System, Polish Geological Society Starachowice, September 27–29, 2001. Przegląd Geologiczny, 2: 103–104 [in Polish]*.
- WIERZBOWSKI A., PIENKOWSKI G., 2002 – Problematyka jurajska w Polsce a wiercenia ICDP. *The Jurassic in Poland versus ICDP drillings. Przegląd Geologiczny, 2: 176–177 [in Polish with English summary]*.
- PIENKOWSKI G., 2003a – Zespół skamieniałości a biocoenoza – reprezentatywność zapisu paleontologicznego – dyskusja. *Fossil assemblage versus biocoenosis – representativeness of the fossil record – a discussion. Przegląd Geologiczny, 3: 214–215 [in Polish with English summary]*.
- PIENKOWSKI G., 2003b – Sequence stratigraphy of Lower and Middle Jurassic formations of the Częstochowa region. *Stratygrafia sekwencyjna utworów dolnej i środkowej jury rejonu Częstochowy. Tomy Jurajskie (Volumina Jurassica), 1: 125–126 [in Polish with English summary]*.
- PIENKOWSKI G., WAKSMUNDZKA M., 2003 – Palynofacies of the epicontinental Lower Jurassic in Poland. *Palinofacje epikontynentalnej dolnej jury w Polsce. Tomy Jurajskie (Volumina Jurassica), 1: 126–127 [in Polish with English summary]*.
- WIERZBOWSKI A., PIENKOWSKI G., 2003 – 7. Międzynarodowe Sympozjum Jurajskie w Polsce w 2006 r. *Przegląd Geologiczny, 3: 190–191 [in Polish]*.
- PIENKOWSKI G., 2004a – Władysław Karaszewski (1911–2003). *Przegląd Geologiczny, 2: 101–103 [in Polish]*.
- PIENKOWSKI G., 2004b – Jubileusz 80-lecia mgr.inż. Eugeniusza Cieśli. *Eighty year anniversary of Eugeniusz Cieśla Msc. Przegląd Geologiczny, 5: 366 [in Polish]*.
- NAWROCKI J., PIENKOWSKI G., BECKER A., 2005 – Conchostraca (muszloraczki) z najniższego pstręgo piaskowca Zachełmia, Góry Świętokrzyskie – dyskusja. *Conchostraca (clam shrimps) from the lowermost Buntsandstein at Zachełmie, Holy Cross Mts, central Poland – discussion. Przegląd Geologiczny, 3: 222–225 [in Polish with English summary]*.

- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2005 – First traces of pterosaurs in Poland from kimmerid tidal flat formations from Wierzbi-
ca near Radom. Pierwsze ślady pterozaurów w Polsce z utworów kimerydzkiej równi pływowej z Wierzbi-
cy koło Radomia. *Tomy Jurajskie*, 3: 141–142 [in Polish with English summary].
- GUTOWSKI J., PIEŃKOWSKI G., ZŁONKIEWICZ Z., 2006a – Stop B2.5 – Krzemionki, archeological museum in Neolithic under-
ground flint mine, micritic limestones, oolites and laminites (Upper Oxfordian). Jurassic of Poland and adjacent Slovakian Carpath-
ians. Field trip guidebook of 7th International Congress on the Jurassic System. Poland, Kraków, September 6–18, 2006 (Ed. A. Wierzbowski *et al.*): 180–181.
- GUTOWSKI J., PIEŃKOWSKI G., ZŁONKIEWICZ Z., 2006b – Stop B2.7 – Bukowa, large limestone quarry (Upper Oxfordian –
lowermost Kimmeridgian). Jurassic of Poland and adjacent Slovakian Carpathians. Field trip guidebook of 7th International Congress
on the Jurassic System. Poland, Kraków, September 6–18, 2006 (Ed. A. Wierzbowski *et al.*): 188–190.
- NIEDŹWIEDZKI G., PIEŃKOWSKI G., DALMAN S., 2006 – Gigantic theropod dinosaur tracks in the Lower Jurassic. *Volumina Jur-
assica*, 4: 123–124. In: 7th International Congress on the Jurassic System, September 6–18, 2006, Kraków, Poland. Sesjon 3: Palaeo-
ecology, palaeobiogeography.
- PIEŃKOWSKI G., 2006a – Magazynowanie węglowodorów w strukturach solnych w Polsce w świetle założeń projektu NATO-CCMS
982185. Hydrocarbons storage in salt structures in Poland according to principles of the NATO-CCMS 982185 Project. *Przegląd Geo-
logiczny*, 54, 4: 312–313 [in Polish with English summary].
- PIEŃKOWSKI G., 2006b – The epicontinental Lower Jurassic of Poland. *Volumina Jurassica*, 4: 268. In: 7th International Congress on
the Jurassic System, September 6–18, 2006, Kraków, Poland. Sesjon 8: IGCP 506: Marine and non-marine Jurassic – global correla-
tion and major geological events.
- PIEŃKOWSKI G., 2006c – Jurassic of Poland and adjacent Slovakian Carpathians. Field trip guidebook of 7th International Congress on
the Jurassic System. Poland, Kraków, September 6–18, 2006 (Ed. A. Wierzbowski *et al.*): 127–129.
- PIEŃKOWSKI G., 2006d – Field trip B4 – Lower Jurassic marginal-marine and continental deposits – sedimentation, sequences and
ecosystems. Jurassic of Poland and adjacent Slovakian Carpathians. Field trip guidebook of 7th International Congress on the Jurassic
System. Poland, Kraków, September 6–18, 2006 (Ed. A. Wierzbowski *et al.*): 207–235.
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2006a – Pterosaur tracks from the Early Kimmeridgian intertidal deposits of Wierzbi-
ca, Poland. *Volumina Jurassica*, 4: 126–127 (7th International Congress on the Jurassic System, September 6–18, 2006, Kraków, Poland.
Sesjon 3: Palaeoecology, palaeobiogeography).
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2006b – Invertebrate trace fossil assemblage from the Lower Hettangian of Sołtyków, Holy
Cross Mountains, Poland. *Volumina Jurassica*, 4: 127 (7th International Congress on the Jurassic System, September 6–18, 2006,
Kraków, Poland. Sesjon 3: Palaeoecology, palaeobiogeography).
- PIEŃKOWSKI G., WAKSMUNDZKA M., 2006a – Palynofacies of the epicontinental Lower Jurassic deposits of Poland: Their distri-
bution in different sedimentary environments. *Volumina Jurassica*, 4: 102–103 (7th International Congress on the Jurassic System,
September 6–18, 2006, Kraków, Poland. Sesjon 2: Facies analysis and reconstruction of palaeoenvironments).
- PIEŃKOWSKI G., WAKSMUNDZKA M., 2006b – Rhaetian/Hettangian boundary in Pomerania, Poland. *Volumina Jurassica*, 4: 295
(7th International Congress on the Jurassic System, September 6–18, 2006, Kraków, Poland. Sesjon 9: IGCP 458 events).
- PIEŃKOWSKI G., HESSELBO S., 2007 – Marginal marine sedimentation in the early Toarcian in Poland – an effect of global climate
change? Marginalno-morska sedymentacja we wczesnym toarku w Polsce – efekt globalnych zmian klimatycznych? *Tomy Jurajskie*,
4: 129. In: Konferencja Jurassica VI. Ojców, 20–22 września 2007 [in Polish].
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2007 – Trace fossils of invertebrates of the alluvial plain in Sołtyków, early Hettangian, Holy
Cross Mountains. Skamieniałości śladowe bezkręgowców równi aluwialnej w Sołtykowie, wczesny hettang, Góry Świętokrzyskie.
Tomy Jurajskie, 4: 126–127. In: Konferencja Jurassica VI. Ojców, 20–22 września 2007 [in Polish with English summary].
- BROCHWICZ-LEWIŃSKI W., PIEŃKOWSKI G., 2008 – Advances in the Geological Storage of Carbon Dioxide: International Ap-
proaches to Reduce Anthropogenic Greenhouse Gas Emission. Dordrecht. Springer, 2006 (Eds. S. Lombardi *et al.*). *Przegląd Geolo-
giczny*, 56, 2: 112–113.
- BUJOK A., SADŁOK G., PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2008 – Pre-Congress Field Trip A – the Holy Cross Mountains.
Stop 4 – Baranów, Lower Triassic, Upper Spathian. Ichnological sites of Poland: the Holy Cross Mountains and the Carpathian Flysch:
the Pre-Congress and Post-Congress Field Trip Guidebook. The Second International Congress on Ichnology. Cracow, Poland, August
29 – September 8, 2008 (Eds. G. Pieńkowski, A. Uchman): 45–59. Polish Geological Institute, Warszawa.
- GŁOWNIAK E., GRABOWSKI J., PIEŃKOWSKI G., 2008 – 5. Międzynarodowe Sympozjum Projektu IGCP 506. Marine and non-
marine Jurassic: Global correlation and major geological events – Hammamet, Tunezja, 28–31.03.2008. *Przegląd Geologiczny*, 56,
11: 967–972 [in Polish].
- PIEŃKOWSKI G., 2008a – The Kamienna Valley Geopark – more than dinosaurs. *Przegląd Geologiczny*, 56, 8/1: 629–638.
- PIEŃKOWSKI G., 2008b – Jurassic of the Holy Cross Mountains. Types of invertebrate trace fossils from Poland: An illustrated cata-
logue (Ed. A. Uchman): 20–23. Polish Geological Institute, Warszawa.
- PIEŃKOWSKI G., 2008c – The Oligocene flysch of the Podhale Basin. Types of invertebrate trace fossils from Poland: An illustrated
catalogue (Ed. A. Uchman): 66–67. Polish Geological Institute, Warszawa.
- PIEŃKOWSKI G., 2008d – Pre-Congress Field Trip A – the Holy Cross Mountains. Mesozoic cover of the Holy Cross Mountains. Ich-
nological sites of Poland: the Holy Cross Mountains and the Carpathian Flysch: the Pre-Congress and Post-Congress Field Trip Guide-

- book. The Second International Congress on Ichnology. Cracow, Poland, August 29 – September 8, 2008 (Eds. G. Pieńkowski, A. Uchman): 10–17. Polish Geological Institute, Warszawa.
- PIEŃKOWSKI G., 2008e – Pre-Congress Field Trip A – the Holy Cross Mountains. Stop 8 – Krzemionki Opatowskie Neolithic flint mine, Upper Jurassic, Upper Oxfordian. Ichnological sites of Poland: the Holy Cross Mountains and the Carpathian Flysch: the Pre-Congress and Post-Congress Field Trip Guidebook. The Second International Congress on Ichnology. Cracow, Poland, August 29 – September 8, 2008 (Eds. G. Pieńkowski, A. Uchman): 79–82. Polish Geological Institute, Warszawa.
- PIEŃKOWSKI G., GŁOWNIAK E., UCHMAN A., 2008 – Pre-Congress Field Trip A – the Holy Cross Mountains. Stop 3 – Gniezdziska, Callovian-Oxfordian. Ichnological sites of Poland: the Holy Cross Mountains and the Carpathian Flysch: the Pre-Congress and Post-Congress Field Trip Guidebook. The Second International Congress on Ichnology. Cracow, Poland, August 29 – September 8, 2008 (Eds. G. Pieńkowski, A. Uchman): 47–53. Polish Geological Institute, Warszawa.
- FELDMAN-OLSZEWSKA A., GAŹDZICKI A., KOPIK J., MATYJA B.A., PIEŃKOWSKI G., 2009 – Jurassic. Supplement to the Stratigraphic Chart of Poland: Extra-Carpathian Poland, Carpathians. Jurassic. Supplement do Tabeli Stratygraficznej Polski: Polska pozakarpaska, Karpaty (Ed. R. Wagner). Państwowy Instytut Geologiczny – PIB, Warszawa [in Polish].
- PIEŃKOWSKI G., 2009a – From lithostratigraphy to cyclostratigraphy – innovative directions in the research of Professor Ryszard Dadlez. Od litostratygrafii do cyklostratygrafii – nowatorskie kierunki w badaniach Profesora Ryszarda Dadleza (1931–2008). *Przegląd Geologiczny*, **57**, 5: 387–392 [in Polish].
- PIEŃKOWSKI G., 2009b – Geopark “Valley of the Kamienna River”. Prospects for the development of geoparks in the light of landscape and regional studies. VIII Polish jubilee scientific conference of the series Nature protection and tourism. Geopark „Dolina Kamiennej”. Perspektywy rozwoju geoparków w świetle badań krajobrazowych i regionalnych. VIII ogólnopolska, jubileuszowa konferencja naukowa z cyklu Ochrona przyrody a turystyka. Kielce, 24–26 września 2009. Streszczenia referatów i posterów. Polskie Towarzystwo Geograficzne – Oddział Kielecki, Kielce [in Polish].
- PIEŃKOWSKI G., 2009c – 8th IGCP 506 Symposium on Marine and Non-marine Jurassic: Global Correlation and Major Geological Events. 28 August – 3 September 2009, Bucharest, Romania. *Episodes*, **32**, 4: 281–283.
- PIEŃKOWSKI G., 2009d – Triassic. Supplement to the Stratigraphic Chart of Poland: extra-Carpathian Poland, Carpathians. Triassic. Trias. Polska pozakarpaska. Supplement do Tabeli Stratygraficznej Polski: Polska pozakarpaska, Karpaty (Ed. R. Wagne). Państwowy Instytut Geologiczny – PIB, Warszawa [in Polish].
- PIEŃKOWSKI G., 2009e – Geopark “Kamienna Valley”. Prospects for the development of geoparks in the Holy Cross Mountains region. Geopark „Dolina Kamiennej”. Perspektywy rozwoju geoparków w regionie świętokrzyskim. Kieleckie Towarzystwo Naukowe: 31–46 [in Polish].
- PIEŃKOWSKI G., 2009f – Krzemionki Opatowskie and Bałtów – a trip into the Jurassic past. Prospects for the development of geoparks in the Holy Cross Mountains region). Krzemionki Opatowskie i Bałtów – wycieczka w jurajską przeszłość. Perspektywy rozwoju geoparków w regionie świętokrzyskim. Kieleckie Towarzystwo Naukowe [in Polish].
- PIEŃKOWSKI G., FELDMAN-OLSZEWSKA A., 2009 – EU GeoCapacity – Towards a Europe-wide GIS of CO₂ emittants and storage sites (Willischer *et al.*, 2008) – discussion. Das EU-Projekt GeoCapacity – ein europawites GIS mit CO₂-Emittenden und Speichermöglichkeiten (Willischer *et al.*, 2008) – Discussion. *Zentralblatt für Geologische Wissenschaften*, **37**, 1/2: 121–122.
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2009 – Pre-Congress Field Trip A – the Holy Cross Mountains. Stop 6 – Sołtyków natural reserve, Lower Hettangian. Ichnological sites of Poland: the Holy Cross Mountains and the Carpathian Flysch: the Pre-Congress and Post-Congress Field Trip Guidebook. The Second International Congress on Ichnology. Cracow, Poland, August 29 – September 8, 2008 (Eds. G. Pieńkowski, A. Uchman): 65–77., Polish Geological Institute, Warszawa.
- PIEŃKOWSKI G., WIERZBOWSKI A., 2009 – 8. Sympozjum IGCP 506 Marine and non-marine Jurassic: global correlation and major geological events. Bukareszt i Południowe Karpaty, 28.08–03.09.2009 (8th Symposium of IGCP 506). *Przegląd Geologiczny*, **57**, 11: 940–943 [in Polish].
- PIEŃKOWSKI G., MARTIN A.J., MEYER C.A., 2009 – Special Issue: Second International Congress on Ichnology (Ichnia 2008) Kraków, Poland: August 29 – September 8, 2008: Preface. *Geological Quarterly*, **53**, 4.
- HESELBO S.P., PIEŃKOWSKI G., 2010 – Stepwise atmospheric Carbon isotope excursion during the Early Jurassic oceanic anoxic event. *Earth Science Frontiers*, **17**, Special Issue: 343–344.
- PIEŃKOWSKI G., MADER A., 2010 – The Kamienna Valley Geopark (Holy Cross Mts., Poland) – an unique geoeeducational area. 9th European Geoparks Conference 2010: Geoparks: Learning from the Past – Building a Sustainable Future. Celebrating 10 years of Innovation. Lesvos Island, Greece, 1–5 October 2010. Natural History Museum of the Lesvos Petrified Forest, Lesvos. Abstracts, 127.
- PIEŃKOWSKI G., STEMPIEŃ-SALEK M., 2010 – Stop 13. Krzemionki – Archeological Museum and Reserve. CIMP Poland 2010 General Meeting. Guidebook of the Holy Cross Mountains field trip, September 16th–19th: 60–62. Institute of Geological Sciences, Polish Academy of Sciences, Warsaw.
- KUHLMANN G., BECKER A., FELDMAN-OLSZEWSKA A., GEISSLER E., HÖDING T., MÜLLER C., OBST K., TOMASZCZYK M., PIEŃKOWSKI G., GERLING J.P., 2010 Harmonised trans-national geology – a necessity for near border subsurface CO₂-storage. SDGG GeoDarmstadt 2010, Heft 68.
- PIEŃKOWSKI G., WIERZBOWSKI A., ZIÓŁKOWSKI P., 2010 – 8. Międzynarodowy Kongres Jurajski – Syczuan, Chiny, 9–13.08.2010. 8th International Congress on the Jurassic System – Sichuan, China, 9–13.08.2010. *Przegląd Geologiczny*, **58**, 12: 1120–1124 [in Polish].

- PIEŃKOWSKI G., POPA M.E., KĘDZIOR A., 2010 – Early Jurassic Sauropod footprints of the Southern Carpathians, Romania: Palaeobiological and palaeogeographical significance. *Earth Science Frontiers*, **17**, Special Issue: 193–196.
- PIEŃKOWSKI G., HESSELBO S., 2011 – Application of carbon isotope studies for paleoclimate reconstruction and high-resolution chemostratigraphy in Early Toarcian (Jurassic) formations in the Polish Basin). Zastosowanie badań izotopów węgla do rekonstrukcji paleoklimatu i wysokorozdzielczej chemostratygrafii w utworach wczesnego toarku (jura) w basenie polskim. XI Konferencja Analityka w służbie hydrogeologii, geologii i ochrony środowiska, Warszawa, 25–26.05.2011 r. Materiały konferencyjne. Państwowy Instytut Geologiczny – PIB. Komisja Spektrometrii Atomowej i Cząsteczkowej KChA PAN: 1-2 [in Polish].
- PIEŃKOWSKI G., WÓJCICKI A., 2011 – CO₂ Storage – Projects in Poland and the role of R&D organizations. Energy Region – NRW, Network Power Plant Technology Dusseldorf: 2011: 2nd International Workshop ‘CO₂: CCS and CCU’ in Germany, Norway, The Netherlands, Poland, and Scotland – Challenges and Chances, 9–11 November 2011, Dusseldorf, Germany Power Plant Technology Network, www.ccs-ccu-workshop-2011.de.
- PIEŃKOWSKI G., 2012 – Future energy structure and the role of CCS in Poland – conclusions from recent conferences in Germany and Poland. Przyszła struktura energetyczna oraz rola CCS w Polsce – wnioski z ostatnich konferencji w Niemczech i w Polsce. *Przegląd Geologiczny*, **60**, 1: 4 [in Polish with English summary].
- PIEŃKOWSKI G., TRELA W, MARYNOWSKI L., 2012 – Stop 9. Sołtyków – Lower Jurassic (Hettangian). *GeoShale 2012 – Recent Advances in Geology of Fine-Grained Sediments*: 186–191.
- BRĄŃSKI P., HESSELBO S., HODBOD M., KRZEMIŃSKA M., LENG M., NIEDŹWIEDZKI G., PIEŃKOWSKI G., 2015 – Lisowice – a moric or a retic? Silesian Dinosaurs (not only) from Krasiejów. V Popular Science Session. Lisowice – noryk czy retyk? Śląskie Dinozaury (nie tylko) z Krasiejowa. V Sesja Popularnonaukowa. Instytut Palaeobiologii PAN [in Polish].
- CHANGBO C., PIEŃKOWSKI G., 2015 – Shale gas in China – How much and when? Gaz z łupków w Chinach – ile i kiedy? *Przegląd Geologiczny*, **63**, 10: 1206–1214.
- PIEŃKOWSKI G., HESSELBO S.P., 2018 – The 10th International Congress on the Jurassic System, San Luis Potosí, Mexico, 4th-10th of February 2018. *Volumina Jurassica*, **16**: 199–202.
- MIKULSKI S., WISZNIEWSKA J., MARKOWIAK M., PAŃCZYK M., CZAPOWSKI G., MAŁEK R., CHMIELEWSKI A., SADŁOWSKA K., PIEŃKOWSKI G., OSZCZEPALSKI S., DAMRAT M., KAULBARSZ D., KOZDROJ W., 2019 – Verification of the state of knowledge of rare earth elements (REE) mineralization in selected metallogenic formations in Poland with a pilot assessment of their deposit prospects. Weryfikacja stanu wiedzy o mineralizacji metalami ziem rzadkich (REE) w wybranych formacjach metalogenicznych w Polsce wraz z pilotażową oceną ich perspektyw złożowych. XXIX Konferencja Aktualia i Perspektywy Gospodarki Surowcami Mineralnymi, Ryto 6–8 listopada 2019: 79–80 [in Polish].
- PIEŃKOWSKI G., NIEDŹWIEDZKI G., 2021 – Borkowice – a world-class paleontological site with footprints and bones of Early Jurassic dinosaurs. *Przegląd Geologiczny*, **69**: 716–720, doi: 10.7306/2021.39.

ARCHIVAL ITEMS

- PIEŃKOWSKI G., 1976 – Trace fossils of the Podhale flysch. Master’s thesis. Library of the Faculty of Geology, University of Warsaw. Skamieniałości śladowe fliszu podhalańskiego. Praca magisterska. Biblioteka Wydziału Geologii Uniwersytetu Warszawskiego [in Polish].
- PIEŃKOWSKI G., 1981 – Sedimentology of the Lower Liassic of the northern margin of the Holy Cross Mountains. Doctoral dissertation. Library of the Faculty of Geology, University of Warsaw. Sedymentologia dolnego liasu północnego obrzeżenia Gór Świętokrzyskich. Praca doktorska. Biblioteka Wydziału Geologii Uniwersytetu Warszawskiego [in Polish].
- PIEŃKOWSKI G., 1982a – Sedimentology of clastic formations of Rhaetian and Lias in the profile of borehole Przystajń 2/81. Central Geological Archives, Polish Geological Institute. Sedymentologia utworów klastycznych retyku i liasu w profilu otworu wiertniczego Przystajń 2/81. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- PIEŃKOWSKI G., 1982b – Bathymetric-environmental analysis of the Zhdanov strata in the Sudetes (Silurian) based on trace fossil finds. Expert opinion. Central Geological Archives, Polish Geological Institute. Analiza batymetryczno-środowiskowa warstw zdanowskich w Sudetach (sylur) na podstawie znalezisk skamieniałości śladowych. Ekspertyza. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- BRĄŃSKI P., PIEŃKOWSKI G., 1986 – Outline of sedimentation and paleogeography of the Triassic and Liassic in the Świętokrzyskie region. Central Geological Archives, Polish Geological Institute. Zarys sedymentacji i paleogeografii triasu i liasu w regionie świętokrzyskim. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- PIEŃKOWSKI G., KIERSNOWSKI H., 1990 – Determination of directions for further exploration of natural gas deposits in the Red deposits on the basis of sedimentological studies – region of the Paproć – Silent Mountain deposits. Central Geological Archives, National Geological Institute; PGNiG Archives. Wyznaczanie kierunków dalszego rozpoznania złóż gazu ziemnego w czerwonym spągowcu na podstawie badań sedymentologicznych – rejon złóż Paproć – Cicha Góra. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny; Archiwum PGNiG [in Polish].
- KRZYWIEC P., CZAPOWSKI G., FELDMAN-OLSZEWSKA A., IWANOW A., KIERSNOWSKI H., NARKIEWICZ K., PIEŃKOWSKI G., WYSOCKA A., SZULC J., SZEWCZYK J., 2001 – Integrated geophysical-geological analysis of the Triassic

- Basin of the Polish Lowlands, KBN topic 9T12B02415. Central Geological Archives, Polish Geological Institute. Zintegrowana analiza geofizyczno-geologiczna basenu triasowego Niżu Polskiego, temat KBN 9T12B02415. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- PIEŃKOWSKI G., WAKSMUNDZKA M., 2002 – Palynological spectra of Lower Jurassic sedimentary environments in Poland. Central Geological Archives, Polish Geological Institute. Spektra palinologiczne środowisk sedymentacyjnych dolnej jury w Polsce. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- BRAŃSKI P., PIEŃKOWSKI G., 2005 – Upper Triassic and Lower Jurassic kaolinitic clays-Study of genesis and directions of exploration. Central Geological Archives, Polish Geological Institute. Górnotriasowe i dolnojurańskie iły kaolinitowe- studium genezy i kierunku poszukiwań. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- PIEŃKOWSKI G., HAMILTON M., ERTURK O., 2006 – Storage of petroleum in salt caverns and the use of salt brine as a medium for improvement of environment. NATO-CCMS Short-Term Project EAP.CMS-PS 982185. Kwatery Główna NATO, Bruksela; Kancelaria Premiera R.P.; Ministerstwo Obrony Narodowej.
- PIEŃKOWSKI G., WAGNER R., CZAPOWSKI G., TOMASSI-MORAWIEC H., PRUSSAK W., LIDZBARSKI M., CHEŁMIŃSKI J., TOMASZCZYK M., 2007 – Dokumentacja geologiczno-inżynierska (część geologiczna), podziemny magazyn paliw płynnych „Dębogórze”. Dokumentacja wykonana dla Operatora Logistycznego Paliw Płynnych (OLPP). Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny.
- BRAŃSKI P., PIEŃKOWSKI G., POPRAWA P., IWASIŃSKA-BUDZYK I., JASKÓLSKA M., NARKIEWICZ W., GIRO L., 2008 – Upper Triassic and Lower Jurassic kaolinitic clays – study of genesis and directions of exploration, stage II. Central Geological Archives, Polish Geological Institute. Górnotriasowe i dolnojurańskie iły kaolinitowe – studium genezy i kierunku poszukiwań, etap II. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- BRAŃSKI P., PIEŃKOWSKI G., IWASIŃSKA-BUDZYK I., JASKÓLSKA M., NARKIEWICZ W., GIRO L., 2010 – Studies of the record of global greenhouse effects in clay sediments of the Lower Jurassic of the Polish Basin. Central Geological Archives, Polish Geological Institute. Badania zapisu globalnych efektów cieplarnianych w osadach ilastych jury dolnej basenu polskiego. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny [in Polish].
- SZYNKARUK E., PIEŃKOWSKI G., FELDMAN-OLSZEWSKA A., KOZŁOWSKA A., JAROSIŃSKI M., WRÓBEL G., 2011 – Execution of research works, works necessary to organize, execute and interpret geological surveys for the purpose of selecting the optimal geological structure for the location of an underground carbon dioxide storage facility. Expertise – documentation performed to the order of PGE Bełchatów, subject number 40-2200-0946-38-0. Wykonanie prac badawczych, prac niezbędnych do zorganizowania, wykonania i interpretacji badań geologicznych służących do wytypowania optymalnej struktury geologicznej dla lokalizacji podziemnego składowiska dwutlenku węgla. Ekspertyza – dokumentacja wykonana na zamówienie PGE Bełchatów, nr tematu 40-2200-0946-38-0 9 [in Polish]. Centralne Archiwum Geologiczne, Państwowy Instytut Geologiczny.

