

**From *Mente et malleo* to *Mente et instrumentis*:
the history of the Institute of Geological Sciences, Polish Academy of Sciences, as seen
through the eyes of its oldest employee**

Ladies and Gentlemen,

I feel among you like a living fossil - a witness to bygone eras - since I have been taking part in the evolution of our institution for 54 years now, that is, since 1972. The older I get, the more I appreciate the value of anniversaries such as today's, which remind us that we are only a link in the chain of generations, something so easily forgotten in today's egocentric times. An anniversary is a procedure belonging to the field that Bruno Schulz called chronotherapy: giving meaning to the present by immersing it in the past.

I shall therefore try to administer some chronotherapy to you, that is, to briefly recount our shared history. It has been written about on the occasion of previous anniversaries by Stefan Alexandrowicz, Elżbieta Turnau, Barbara Kietlińska-Michalik, Stanisław Czarniecki, Teresa Madeyska, and Andrzej Żelaźniewicz. I drew on these sources while preparing today's address.

As we all know, history consists, on the one hand, of facts and, on the other, of their interpretation - in other words, historical policy. I shall begin by listing the facts:

On 4 April 1865, the Kraków Scientific Society (TNK), on the initiative of its chairman, Professor Józef Majer, established the Physiographic Commission, whose purpose was to 'describe the Polish lands in terms of all their natural properties, such as: location, topography, climate, meteorological conditions, geology, flora, and fauna.' This was a response to our country's lag in this field, as analogous institutions were already operating in many European countries.

One year later, the Orographic and Geological Section of the Physiographic Commission was constituted; from 1884 it was called the Geological Section, because the topographic surveys of Galicia had already been completed.

Seven years later, in 1873, the Physiographic Commission was taken over by the Academy of Learning and, after Poland regained independence, from 1919 it became part of the Polish Academy of Learning (PAU).

In 1952 the Polish Academy of Sciences (PAN) was established and took over the assets of the PAU.

On 1 March 1954, the Presidium of PAN, on the initiative of Professor Jan Samsonowicz from Warsaw and Marian Książkiewicz and Walery Goetel from Kraków, established in Kraków, 'on the basis of the geological department of the former Physiographic Museum of the PAU,' the Geological and Stratigraphic Laboratory of PAN, which took over the premises, geological collections, library, and staff of the PAU institution.

On 3 January 1956, the Presidium of PAN established the Department of Geological Sciences of PAN, with its seat in Warsaw, incorporating the Kraków laboratory into the new structure. Professor Jan Samsonowicz became its first director.

In June 1979, the Presidium of PAN transformed the Department into the Institute of Geological Sciences of PAN, and we have functioned in this structure to this day.

So much for the bare facts. But how do we interpret them? Formally, the Institute of Geological Sciences of PAN is only 47 years old, but in Warsaw, 1956 - the establishment of the Department - is traditionally accepted as the Institute's founding date, while in Kraków it is 1954 - the establishment of the Laboratory. To reconcile these views somehow, by way of the proverbial 'Kraków compromise,' we are celebrating our anniversary in 2026, but in Kraków. In my opinion, which I shall try to justify more fully, the institutional continuity between the Physiographic Commission of the Kraków Scientific Society and the Institute of Geological Sciences of PAN is so obvious that today we should be celebrating the 160th anniversary of the establishment of the Orographic and Geological Section of the TNK - the first Polish geological research institution, of which we are the modern version. I think that Professor Jan Samsonowicz's son, Professor Henryk Samsonowicz, the well-known Warsaw historian and once our minister, would agree with me on this point. I shall therefore begin my chronotherapy with the Geological Section of the Physiographic Commission.

From the early history of the Geological Section, two names are most worth remembering: its first long-serving chairman, Alojzy Alth, and Stanisław Zaręczny. The Section's activities included geological research, the preparation of geological maps, the gathering of geological collections, and, in the initial period, also hypsometric measurements. The greatest achievement of the Geological Section, and at the same time of the entire Physiographic Commission - unique on the scale of Austria-Hungary - was the study of the whole territory of Galicia and the publication, in 1887-1913, of 25 fascicles of the Geological Atlas of Galicia, comprising 99 map sheets at a scale of 1:75,000 with extensive explanatory notes, prepared by 14 authors. The best-known and most highly valued is the map of the Grand Duchy of Kraków prepared by Stanisław Zaręczny in both covered and uncovered versions, which was a novelty at the time. The oil portrait of Stanisław Zaręczny hangs in our premises on Senacka Street next to the portrait of Feliks Kreutz, Alth's student, a mineralogist and crystallographer, chairman of the Geological Section during the publication of the Atlas, and earlier a professor at Jan Kazimierz University in Lwów. The missing Wadowice sheet was prepared in the interwar period by Marian Książkiewicz, assistant to Władysław Szajnocha, and after the war one of the initiators and then scientific head of the Kraków laboratory of PAN and the third director of the Department of Geological Sciences of PAN. His sheet of the Geological Atlas of Galicia was printed in 1951, the same year in which the General Assembly of the PAU, under pressure from the political authorities, adopted a resolution transferring its institutions and assets to PAN, three years before the establishment of our Kraków institution.

The Geological and Stratigraphic Laboratory of PAN inherited from the Physiographic Museum and Geological Section the ground-floor premises in the PAU building on Sławkowska Street, where it was later housed for its first 12 years, together with the library, paleontological and mineralogical collections, and the meteorite collection initiated by Ignacy Domeyko, thus took on both roles: research and museum operations. Personal continuity was ensured by Wilhelm Krach, an employee of PAU from 1945 and later twice head of the Laboratory. During the two years of the Laboratory's independent existence, four new research staff members were employed - students of the Laboratory's scientific supervisor, Marian Książkiewicz: Dr. Stanisław Dżułyński

as head, and the master's degree holders Stanisław Czarniecki, Krzysztof Birkenmajer, and Stanisław Gąsiorowski, as well as the laboratory assistant Wojciech Gąsiorek. The supervisor's scientific interests - sedimentology, paleontology and stratigraphy, and regional geology - defined the Laboratory's research profile.

When the Department of Geological Sciences of PAN was established in 1956, the Kraków Geological and Stratigraphic Laboratory was incorporated into it, and five new laboratories were organized: in Warsaw, the Laboratory of Geochemistry, Mineralogy and Petrography (head: Kazimierz Smulikowski), the Paleozoic Laboratory (Jan Samsonowicz), the Mesozoic and Cenozoic Laboratory (Stefan Zbigniew Różycki), and the Laboratory of Hydrogeology and Engineering Geology (Kazimierz Guzik), with a section located in Gdańsk (Zdzisław Pazdro); and in Wrocław, the Laboratory of Sudetes Geology (Henryk Teisseyre). Of these first seven heads, only Jan Samsonowicz was born within today's Poland; the others were born in today's Ukraine. Samsonowicz, Smulikowski, Pazdro, and Teisseyre worked before the war at universities in Lwów.

The Department was organized extraordinarily quickly: by the end of 1956, it employed 55 research staff. Initially, the new Department laboratories in Wrocław and Warsaw were housed in university buildings, also using access to university equipment. The authority to confer doctoral degrees has been granted in 1960. The Kraków institution obtained its own premises in 1966, the Wrocław one in 1975, and the Warsaw one in 1996 - that is, only at the institute stage. The successive directors of the Department were Professors Samsonowicz, Smulikowski, Książkiewicz, and Znosko.

The division into laboratories reflected well the research profile of the first two decades, similar to the tasks of the Geological Section of the PAU Physiographic Museum, dominated by the recognition of Poland's geological structure and resources - that is, by regional problems. Similar research was also conducted abroad, most extensively in polar regions and in Cuba. The results were published mostly in Polish publishing outlets, including the institution's own series: *Studia Geologica Polonica* (from 1958) and *Geologia Sudetica* (from 1964), and presented in the form of maps, in particular of the Tatra and Pieniny Mountains. Thanks to digitization, some of these results are now available in international circulation. In my view, the works of Książkiewicz and Dżułyński on sedimentary structures in flysch, the mineralogical works of Smulikowski and Wiewióra, and Burchart's fission-track studies had the greatest supra-regional significance. I know the final years of the Department from personal experience, since Professor Książkiewicz hired me in 1972, with the task of studying clay minerals in the Carpathians. Those were the days of geology under the sign of 'Mente et malleo,' because in that era the purchase of heavier equipment was out of the question. It is true that a French X-ray diffractometer was operating in Warsaw, but on Senacka Street I found a laboratory for separating fossils, several optical microscopes and binocular magnifiers - and, of course, those hammers. Thanks to the support of Professor Maria Borkowska, then director for scientific affairs, I managed to organize a clay laboratory and, in 1975, to obtain a Soviet DRON X-ray diffractometer.

The transformation of the Department into the Institute in 1979 preceded the Solidarity revolution by one year. On that wave, Maria Borkowska became director in 1980 and guided the Institute with a steady hand through that difficult period, undoubtedly exceptional in our history. As early

as 1976, many employees took part in the activities of the pre-August opposition, and from August 1980 in the activity of the Independent Self-Governing Trade Union Solidarity, first openly and then underground. On 13 December 1981, Dr. Krzysztof Görlich, a Solidarity activist at the regional level, was interned and released after two weeks thanks to the intervention of PAN. In 1982 Professor Elżbieta Turnau spent 48 hours under arrest, and Jan Środoń six weeks. After the Round Table Agreements in 1989, Professor Jan Dowgiałło became chairman of the reactivated nationwide Solidarity commission in PAN, and Jan Środoń became his deputy. The following year, Krzysztof Görlich became deputy mayor of Kraków, and Jan Dowgiałło became the first ambassador of the Third Republic of Poland to Israel, and later the initiator and lecturer of the Chair of Polish History and Culture at the Hebrew University of Jerusalem. We have a specific testimony to the activity of the Kraków center during that period, namely a 1983 Security Service report published by the Institute of National Remembrance, which lists our center as the PAN institution in Kraków most 'at risk,' in which three people were under individual surveillance (half of all individual surveillance cases in Kraków's PAN), and admits that this was the only PAN institution in which, up to that point, no one had been recruited for collaboration.

The 1990s marked the beginning of the way of doing science that we know today. In 1985 the first personal computer appeared in the Institute, in 1991 the fax machine, and a few years later e-mail and an automatic photocopier. It is hard to imagine from today's perspective. Laboratories were built and equipped: the stable isotope laboratory (Paweł Leśniak, 1980s), the alpha spectrometry laboratory for dating cave speleothems (Helena Hercman, 1998), the heavy isotope and geochronology laboratories (Jan Burchart in Warsaw, 1990, and Robert Anczkiewicz in Kraków, 2007), the laboratory for culturing and studying foraminifera (Jarosław Tyszka, 2012), as well as the K-Ar laboratory and the surface area and porosity measurement facilities within the clay laboratory (Michał Banaś, Arkadiusz Derkowski, Marek Szczerba). An important role in equipping laboratories, but also in intensifying international contacts, was played by the European ATLAB program, obtained on the initiative of the director, Professor Marek Lewandowski. Moreover, thanks to ATLAB funds, we brought from abroad the current director, Stanisław Mazur, and the current head of the clay laboratory, Arkadiusz Derkowski. Under the influence of these new possibilities, the Institute's research profile gradually evolved in a direction that may be symbolically called 'Mente et instrumentis.'

In the early 1990s, during the term of director Andrzej Pszczółkowski, the Institute's mode of operation also changed. Periodic evaluations of research staff were introduced before they were required by an amendment to the PAN Act; somewhat later, annual reporting and program conferences were introduced; research funds from the subsidy ceased to be allocated at the director's discretion and were linked to evaluation results; and, after long battles with the older generation, the opinion prevailed that we should publish in international periodicals. The effects of these modernization measures can be clearly captured statistically, for example on the basis of publications in journals - the most important product of a scientific institution: the number of peer-reviewed publications has increased three- to fourfold since then, the share of publications in international journals has risen from 30% to almost 100%, and the number of peer-reviewed publications per researcher has grown from 0.5 to 2.0 per year. In my opinion, such a calculation makes sense, since the efficiency of scientists is the limiting factor here, although publications are the joint work of scientists and technicians. The efficiency of our administration and support

staff has also increased, as a result of which the proportion of research staff has risen from 35% to 60%. The rapid improvement in our indicators began around 2017, that is, at the start of Professor Ewa Słaby's first term.

We are pleased by this evolution, but the question remains of the Institute's position in world science. I was unable to find such synthetic comparative data, but an interesting picture can be obtained by examining the positions of our professors in world science on the ScholarGPS platform, calculated on the basis of their productivity and the quality and impact of their research. In the generation of our retirees, I found 10 professors with full ScholarGPS evaluations who rank in the top 10% of scientists across all disciplines, including one in the top 2%, and three in the top 2% in their specialty. In the next generation, which is currently leading the Institute, there are 13 professors in the top 10%, including two in the top 2% and seven in the top 2% in their specialty. One of our doctors has also already reached the top 10%. In my opinion, these are very good results, meaning that we make a significant contribution to world science. The data on specialties show how the Institute's scientific themes have evolved from regional to more universal ones. This is a natural trend, reflecting the development of our discipline: without recognizing regional geology, it is difficult to pursue universal disciplines.

In closing, I will mention the Institute's contribution to teaching and the popularization of geology, which continues this aspect of the Physiographic Commission's activity from the years 1888-1954: the permanent exhibition (since 1994) 'The Geological Structure of the Kraków Area' by Professor Ryszard Gradziński; temporary exhibitions, including those of meteorites and lunar rock from the Apollo 11 mission (1972); Museum Nights; Researchers' Nights; lessons for schools; popular-science articles and films; and our pro publico bono contribution: the successful two-year battle (2013-2014), in cooperation with the president of the PAU, Professor Andrzej Białas, to change the Public Procurement Law.

I hereby conclude my chronotherapy and wish you that in 10 years, when you celebrate the next anniversary, our Institute will be in even better condition than it is now - while being, of course, aware that this does not depend entirely on us, since decisions on the amount of the statutory subsidy are made above our heads and are not a simple function of our scientific activity.

Thank you

to the ladies: Anna Środoń, Marta Godzwon, and Jolanta Kotowicz, and to the gentlemen: Przemysław Gedl, Adam Jaracz, and Jarosław Tyszka, for their help in preparing this address.