

IN MEMORY

Nonna Bakun-Czubarow

November 18, 1937–April 18, 2012

Memories and personal reminiscences

Nonna Bakun-Czubarow was born on November 18th, 1937, in Brześć on Bug. In 1961 she obtained her MSc degree in mineralogy and petrography from the Faculty of Geology, Warsaw University. She started and continued her professional career with the Institute of Geological Sciences PAS (formerly Zakład Nauk Geologicznych PAN). In 1965, as the scholarship holder, she defended her PhD thesis: “Geochemical characteristics of Nowa Wieś eclogites in the area of Śnieżnik Kłodzki” (original title in Polish: “Geochemiczna charakterystyka eklogitów Nowej Wsi w regionie Śnieżnika Kłodzkiego”). She was always augmented her professional knowledge and carried out studies abroad in the former Soviet Union in the following scientific institutions: the Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry of the Academy of Sciences USSR in Moscow, the Institute of Geology and Geophysics in Novosibirsk and in the Vernadsky Institute of Geochemistry in Moscow. She also studied in the USA, in the Geophysical Laboratory, Carnegie Institute of Washington and in the Lamont-Doherty Earth Observatory of Columbia University in Palisades.

In her quest to find traces of deep burial in the Earth’s mantle, she encountered ultra-high pressure metamorphic rocks in the Sudetes in SW Poland. She also evidenced ultra-deep origin of rocks in the Góry Sowie Mountains in Poland and in the Sulu region in China. In the year 1999, she obtained the habilitation degree based on the coherent set of papers entitled: “Variscan metamorphic rocks of the eclogite facies in the Western Sudetes: mineralogy, geochemistry and palaeogeodynamic significance” (original title in Polish: “Waryscyjskie skały metamorficzne facji eklogitowej w Sudetach Zachodnich: mineralogia, geochemia i znaczenie paleogeodynamiczne”).

However, Nonna’s scientific interests went far beyond high-pressure rocks. In the last decade, she concentrated on studies of mineralogy and chemistry of meteorites, Lunar rocks and terrestrial planets in our Solar System. On the other hand, she worked on the origin and the evolution of basaltic magmas of large igneous provinces (Central-European and Volhynian). In the last years, she led an international project dedicated to Fe-Co-Cu metallogenesis and metamorphic and structural evolution of the Shilu deposit and surrounding rocks in Changjiang on the Hainan Island, China.

Nonna Bakun-Czubarow was an unquestionable expert in petrology and geochemistry of ultrabasites and high-pressure metamorphic rocks. In the years 1998–2002, she was a



At the Goldschmidt Conference.

member of the Committee of Mineralogical Sciences of the Polish Academy of Sciences. She was also an elected member in the sixteen-person International Eclogite Conference Co-ordinating Committee – IECCC, and a member of working group UDCCS (Ultra Deep Continental Crust Subduction). Since 1978, she was a national correspondent of the International Association of Volcanology and Chemistry of the Earth’s Interior (IAVCEI). She was the chairperson of the Organizing Committee of the 8th Session of the Petrology Group of the Mineralogical Society of Poland in Łądek Zdrój in 2001.

Nonna Bakun-Czubarow was an author and co-author of 170 scientific papers, among them 5 chapters in monographs (published by Elsevier, PWN and others) and 87 original papers. She was a leader in five Polish and international scientific projects, including one supported by the European Commission. Nonna was a supervisor in four PhD theses and one MSc thesis. She was a lecturer and instructor in crystallography and thermodynamics in petrology in the Department of Geology, Warsaw University and in the Faculty of Mathematics and Natural Sciences in the Branch of Warsaw University in Białystok. She also conducted a seminar for PhD students on “Petrology of the



Among staff members (in the middle) at the Institute of Geological Sciences PAS 2010 Conference, Podlesice, the Polish Jura.

Earth's mantle" in the Institute of Geological Sciences and in the Institute of Geophysics of the PAS. Since 1988, she was the scientific secretary of the editorial office of journal *Archiwum Mineralogiczne*.

Andrzej Wilamowski, Polish Geological Institute, Warsaw

I met Nonna in autumn 1955, when Warsaw was cleaning its streets after the Youth and Student Festival, and getting ready to receive the young people starting their new academic year. I started to live in a student hostel in Radomska street, in a four-bedded room, where I saw Nonna for the first time – a tall and swarthy girl, with beautiful brown eyes, from Białystok. Nonna, looking into my eyes, said: "Welcome". A bit surprised, I responded with the same word. She often used to disappear in the "silent learning room" which was her favourite place, and where she worked on her lectures notes. Very soon, she appeared to be a hard-working, solid and helpful person, becoming also popular among students and well recognized by academic teachers.

Nonna, from the very beginning, was interested in high-pressure phases. Eclogites became the rocks which she devoted most of her professional activities to. Both her specific scientific interests and her competence were noticed by our master, Professor Kazimierz Smulikowski. Beside eclogites, also basalts arrived in Nonna's research interests, partly with a little contribution from my side. It was when the Vice-Dean of the Faculty of Geology of the University of Warsaw was looking for somebody who could help to arrange a visit of Ukrainian geologists to Poland. Being aware that I knew the literature of the basalts of Volhynia, he asked me for help and I extended this offer of creating a basalt research team to Nonna, who willingly agreed to cooperate. Rather soon, we managed to visit Ukraine, where we concentrated on fieldwork, using a minibus and collecting

samples for future studies. Of course, there were many adventures and funny situations at border crossing where the customers were always astonished to see heavy loads of rock samples carried through the frontier. We visited Ukraine many times, as Nonna loved Volhynia, where her husband's family was rooted, and where we often experienced good will and friendliness of the local people.

We published two articles about basalts and several short communications in Mineralogical Society of Poland – Special Publications. The studies on the Volhynian basalts confirmed us that we were dealing with a large basalt province, that had not been earlier properly recognized. We were able to compare the basalts of Volhynia with those from eastern Poland and to interpret their origins. After years, Nonna became the leader of international research project of the Polish Ministry of Science and Informatisation, "Neoproterozoic igneous province of Volhynia at the western margin of the East-European Craton: genesis and evolution of magmas". The main target of this research, being held with the use of modern mineralogical and geochemical methods, was to recognize the genesis and evolution of the magmas of the flood basalts of the Volhynian Igneous Province, and to provide better knowledge about this large magmatic province and to indicate it on the global maps that show the distribution of the large plateau basalts on Earth. Based on multi-element geochemical diagrams, it was shown that nearly all the analysed basalts of the Volhynian Igneous Province (except the picrites of cycle I of the so called Slawatytcze series) are similar to the continental plateau basalts generated by hot asthenospheric mantle plumes. Geochronological dating, using the K-Ar method, confirmed a Neoproterozoic age of the Volhynian traps. I should acknowledge that all these achievements were made with major scientific contributions from Nonna.

Nonna loved young people. I often saw her offering her time to them, even when she was very busy with her own commitments. She was always ready to share her knowledge and experience with them. She gave lectures and seminars to PhD students, supervised MSc and PhD projects. Ever calm and smiling.

I was lucky to know Nonna not only on profession grounds, but also privately, visiting her at their home. She loved life and people. She was a wonderful wife, mother and grandmother. She always had time to offer to all close to her, in spite of her intense professional work that absorbed her a lot. The serious illness of her husband was a hard experience but she did all she could to ensure condign conditions of his life to the very end. A sound assistance and joy to her were their son Paweł and his Family.

Anna Białowska, the University of Warsaw

I met Nonna Bakun-Czubarow in 1956, when I was a student of the first year of Geology at the University of Warszawa. We both attended lectures and practicals for students of geochemistry and petrography at the Faculty of Chemistry of that University. She was the best student in our group, and we were always amazed at her making preparation for the classes, and the resulted best credits.

MSc theses in geology at our Faculty were mostly performed at that time in the Sudetes. My MSc project was in the Tatra Mountains, thus our close links weakened for a couple of years. Afterwards, getting a position in the Geological Institute, I started to work on Fe-Ti and V ores. I kept seeing Nonna, regularly, at meetings of the Mineralogical Society of Poland. We also co-operated preparing a number of expert-opinions concerning various mineralogical-geochemical issues. One of the research projects, performed in co-operation with the Ukrainian Academy of Sciences, dealt with the Volhynia basalts, the rocks with famous native copper mineralization. I willingly joined that project, keeping in mind my early school years at Stara Ochota district in Warsaw, when Żwirki i Wigury street there was paved with black cubes of basalt from Janowa Dolina in Volhynia.

We undertook also several other joint projects, which not always ended with fully satisfactory results. This was the case of ordering in minerals in the Sudetic eclogites, or attempts in determination of chemical composition of tiny ilmenite inclusions parallel to cleavage in olivines in serpentinites (deep borehole samples) of the Ślęża ophiolite in Lower Silesia. The latest joint studies and presentations at meetings of the Mineralogical Society of Poland and of the Polish Meteoritics Society were devoted to the mineralogy of the Baszkówka meteorite, in particular to the extra-terrestrial troilite.

I keep in my memory many vivid discussions we had with Nonna during many years at the Faculty of Geology of the University of Warsaw in Żwirki i Wigury street and, afterwards, in the Geological Institute of the Polish Academy of Sciences in Twarda street in Warsaw. They covered the unusually wide spectrum of scientific interests of Nonna, including her favourite topics of the extreme physical and chemical conditions of mineral formation on Earth and in the Solar System.

Jacek Siemiątkowski, Polish Geological Institute, Wrocław

I devote this message to a great colleague of mine, a dedicated scientist-geologist, and my dear friend Professor Nonna Bakun-Czubarow. It is always difficult to speak about a friend who is not anymore around you. So, where should I begin? More than three decades ago I have met Nonna during an International field trip to study Mesozoic ophiolites in Caucasus mountains, where Nonna was a representative of geologists from Polish Academy of Sciences, and I was a Ph. D. student from the Institute of Geology and Geochronology in Saint Petersburg, Russia. After short conversations and discussion of the gabbro-peridotites and ophiolitic mélange, I felt that we became friends. There is no mistake if I say that all other colleagues in that field trip felt the same about Nonna.

For years, Nonna Bakun-Czubarow has been a valuable member of Ultra-High-Pressure Metamorphism international scientific community, an outstanding petrologist and an educator. The unrepeatable privilege to be a geologist-scientist is that we are always in travel to see minerals, rocks, mountains, traces of the plate tectonic activities and

that gives us a chance to put geological puzzles together before we return back to our laboratories and universities. Nonna loved geological trips and conferences, she was full of curiosity, energy and activity in collecting samples from the most critical and disputable geological terrains. Her scientific interests were supported by her strong and detailed laboratory researches, her numerous publications were and continue to be cited by many colleagues around the world. Nonna always appreciated her privilege to be in touch with the natural beauty of the geological regions and was always ready to share her academic and field study experience with her colleagues and friends. She was a great mentor for young scientists and students always supporting and encouraging them for independent thinking and innovative researches and ideas.

Much has been known about Nonna's exceptional professionalism, numerous articles, researches, prizes and awards, but what distinguished her from the majority of people with similar qualities – this is her limitless humanism and kindness. Nonna had a lot of compassion and empathy because she was taking care of her disabled husband for many years, sometimes forgetting to think about herself. She was tremendously strong in these circumstances of her life, and her example reminds us whatever problems we might have, there is always someone who is less fortunate and needs our help, and we have to be sensitive to that. Her sensitivity and heroic every-day cares that she offered to her very ill husband reflect their deep love and faith to each other that they maintained and carried through all their life. Nonna was a decent person, full of energy, dignity, integrity and love, caring and enjoyed her life no matter what kind of circumstances.

All of our colleagues that I have spoken about Nonna in regards of this event told me that they have their own treasured memories of Nonna, and I know how much they valued her friendship. Professor Nonna Bakun-Czubarow was such a special person that no words are really adequate. Her scientific and personal life enriched and illuminated her colleagues and friends, and without any exaggeration it was a great pleasure for everyone that knew her.

Larissa Dobrzhinetskaya, University of California, Riverside

On April 18th, 2012, died at the age of 74 Professor Nonna Bakun-Czubarow – a geologist, a longtime researcher and a member of the Scientific Council of the Institute of Geological Sciences of the Polish Academy of Sciences, a meritorious specialist and expert in the field of geochemistry and mineralogy, author of pioneering works on the evolution of high-pressure metamorphic rocks of the eclogite facies, petrology of the Earth's mantle, extraterrestrial objects – meteorites, Lunar rocks and of the Earth Group planets. She was a member of many Polish and international scientific organizations, participating in a number of international programs, and a wonderful and patient academic teacher. We have lost a person of a huge heart, life wisdom and goodness.

The above text is from the obituary posted in *Gazeta Wyborcza newspaper* a few days after Nonna's death. It has

been almost two years since she passed away and I still cannot get used to the loss. When I was asked to write a few words about Nonna, I began to wonder how to describe her attitude towards work and to other people. The most important to her was always the person, regardless of his or her status, education or religion.

My entire professional life was bound to Nonna. It was she who taught me how to work in the lab, showed me how to prepare samples of rocks and minerals, and taught me how important the very first step is in further studies. During our years of working together, I watched how honest and conscientious Nonna was when dealing with problems. Working with Nonna was very creative and interesting. When we were starting a new project, she was always introducing me to the new subject, giving me a short lecture. Her speeches were interesting and full of passion. We were developing results together. We both worked on tables, data and charts, wrote new articles, drew posters and made presentations. For more than 30 years we always were a harmonious team. There were no misunderstandings between us. We understood one another perfectly. She surprised me only once – when she left forever. And every day when I go to work I think I shall meet her there.

Danuta Kusy, Institute of Geological Sciences, PAS, Warsaw

There are no proper words to describe the loss I personally feel after Nonna's pass away. She was my PhD supervisor, my true mentor and the highest scientific authority. But not only this, she was the person of the huge heart, wisdom and kindness. She was one of these people with passion and absolutely dedicated to work. I received from her not only the knowledge of the metamorphic rocks, but as well the lore of dedication at work.

I could often hear from my colleagues that I got really tough supervisor and it will be difficult to finalize. Nothing could be further from the truth! Well, yes, she was tough, but it was something what motivated me more to work. She demanded very much and I learned how to work hard, quick and on the highest possible level. We got along very well.

During the time of writing my thesis, I was travelling a lot between Cracow and Warsaw and I remember her bringing me fruits and yogurts. Once I ate healthy food, I got cookies and chocolate. She always walked me to the train station when I was coming back home and checked if I am in a proper train, if my jacket is buttoned and my bunny on my head. Before my exam, she used to send me the brand new literature, helped to search the libraries for manuals and handbooks. Constant discussion and talks with her were often finished with her reading aloud some paragraphs! Later on I got to know that she was called "grandma".

Few years ago we went together to China. We were visiting the Institute of Geochemistry of the Chinese Academy of Sciences in Guanzhou and then we were taking part in the field trip to the Fe-Co-Cu ore Shilu District on the Hainan Island in South China. Before the trip many people told me to take a good care of "Nonia" because of her age. Well... we both took a good care of each other, but I remember her physical condition was so good that it was impressed for our Chinese collaborators. But they were impressed not only by this, I remember when we visited the Institute, she was treated nearly like a god. The professors and students consulted her, discussed and asked for her advice, and I was surprised how well they were prepared for this scientific visit. She was a true international expert.

I remember as well that Chinese colleagues thought I am her daughter. We made lots of jokes that most probably it is due to our "striking physical resemblance".

I cannot describe how much I miss her...

Monika Kusiak, Institute of Geological Sciences, PAS, Warsaw