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REMINISCENCES

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The veteran research worker of the A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, described his meetings with N.A. Smolyaninov, P.P. Pilipenko, and Yu.A. Bilibin, prominent mineralogists and geologists.

About the author. Moisei Davidovich Dorfman (born 6 February 1908) is the veteran research worker of the A.E. Fersman Mineralogical Museum, Doctor of Geology and Mineralogy, honorary member of the All-Russia Mineralogical Society, author of 135 scientific works including three monographs.
At the start of the Moissei Davidovich's creative development, his scientific work was concentrated on mineralogical study of tungsten deposits in Transbaikalia (Belukha, Bukuka) and Kazakhstan (Akchatau), but his scientific interests were mostly in alkaline rocks and minerals of the Khibiny Massif. His study of mineralogy and pegmatites of the Khibiny Massif led to the discovery of a number of new mineral species and varieties as well as minerals not known there before. The study of so-called ruined zones brought out the development of products of preglacial weathering in Khibiny (including more than 30 minerals not known there before) and let to discover a zirconium (zirfesite) area weathering crust. As a member of the Soviet–Mongolian geological Expedition, M.D. Dorfman studied alkaline rocks of Mongolia for several years and prepared materials for the monograph «The Minerals of Mongolia».
Since 1957, Moisei Davidovich works at the Mineralogical Museum. He has made up several exhibits that show the results of his multiyear works. In the context of great exhibit «Types of Mineral Associations in the Earth's Crust», he created expositions to mineralogy of alkaline pegmatites and weathering crust minerals as well as showcases with minerals of chlorine, fluorine, phosphorus, sulfur, and selenium in the exhibit «Mineralogy of Chemical Elements».
For the two-volume monograph «The Mineralogy of Khibiny Massif», M.D. Dorfman with his co-authors were rewarded with A.E. Fersman Prize established by the Presidium of Academy of Sciences. On the occasion of fiftieth anniversary of the Kola Filial of Russian Academy of Sciences, M.D. Dorfman was awarded with « Transpolar Scientist Veteran» diploma.
In honor of M.D. Dorfman, the mineral *dorfmanite* was named.

When you are more than ninety and continue to work, you are more and more often tempted by the thought to impress your long life experience on paper: to begin writing memoirs. So I decided, too, to undertake my memoirs, by my friends and colleagues advice.

My geological long activities were various and proceeded in the regions with thousands of kilometers one from another: from Middle Asia to Kola Transpolar area. My memory saved interesting and even funny events associated with everyday life of geologists and expedition works, and also with meetings with some leading geologists and mineralogists, brilliant and original persons who knew their job excellently. However, when I took up the pen, it turned to be not so simple to recount all this. Therefore I decided to follow my memory, not too much worrying of chronology and significance of events depicted, but invariably dwelling on my impressions of those remarkable personalities whom the fate brought me together.

Pavel Prokofyevich Pilipenko

Born 23 October 1877, died 3 February 1940.

Mineralogist and geochemist, Doctor of Geology and Mineralogy, Professor of Saratov, Tomsk, and Moscow universities, Head of the chair of mineralogy and geology in the Tomsk university, Head of the chair of mineralogy and crystallography in Moscow Institute of geological survey, vice-rector (for educational and scientific work) of the Moscow Institute of geological survey, director of mineralogical and petrographic

scientific department of Moscow university; creator and curator of Mineralogical museums in the Tomsk and Saratov universities. Awarded with the Akhmatov Great academic Prize.

The first bright recollections of my geological activities are associated with my entering the post-graduate study of the Moscow Institute of geological survey in 1939. By this time, I have already worked in some geological institutions and participated in expeditions. One of latest was the Akchatau wolframite deposit in Kazakhstan.

There were a lot of persons who wished to enter the post-graduate study of the Moscow Institute of geological survey that year. Professor P.P. Pilipenko, a disciple of Academician V.I. Vernadskii, was taking the entering examinations. I was examined in mineralogy, then the questions on crystallography, geochemistry, geology, petrography, and other parts of geological science followed. Each my answer was followed with Professor's remark: «What's the matter with you, really?» Abandoning the Institute after this prolonged and exhausting examination, I was fully confident of my complete illiteracy. It was clear to me that I could not be accepted to the post-graduate study. However, I had to pass another examination, on philosophy this time. My friends advised me to go for this examination despite my report of Prof. Pilipenko's reaction upon my answers when examined in profession.

A week later, Prof. Pilipenko uttered at the senate session: «After competitive examinations, Dorfman is accepted to the Chair of mineralogy...», which was a great and, should be said, very pleasing surprise for me.

My future dissertation related to the genesis of the Akchatau wolframite deposit in Kazakhstan. Having worked there for three seasons and made a careful study of local geology and mineralogy, I reported of my results at the Chair session. I accounted the deposit genesis not for the zoning of hydrothermal process that proceeds in a closed space but for repeated actions of high- to low-temperature solutions. The five types of various age mineralization were found. My conclusions I based persuasively, as I believed, on the paragenesis of each stage of the process. Prof. Pilipenko, the Chair head, turned out to be my opponent. Each my thesis and argument was defeated by him utterly. His critical remarks were so persuasive that it was very difficult to disprove them in the course of discussion... Naturally, I was terribly downcast: it turned out that all my genetic conclusions were incorrect.

But after the session, having analyzed professor's remarks calmly and carefully, I felt I could disprove them easily. Two weeks later, I came to my opponent to share my considerations. Pavel Prokofyevich listened to me attentively and then said, smiling, «Unless you have not come to me with all this, you will have nothing to do at the post-graduate study!»

It should be said that the Professor's original manner manifested in many other things. A year later, having become the Chair instructor, I had to train the students in using blowpipe. To check my lessons, Pavel Prokofyevich edged into the laboratory and, pretending to seeking for something, watched my working...

P.P. Pilipenko was a brilliant and original person who possessed thorough knowledge. A non-standard approach to geological problems was in his nature: it was not in vain that he was a disciple of V.I. Vernadskii, one of the most profound minds of the twentieth century.

Nikolai Alekseevich Smol'yaninov

Born 21 May 1885, died 6 April 1957.

Honored Science Worker of R.S.F.S.R, USSR State Prize winner, Doctor of geology and mineralogy, Professor, Head of the mineralogy chairs in Moscow State university and Moscow Institute of geological survey, head of mineralogical section of Lomonosov Institute of Academy of Sciences of the USSR, curator of mineralogical museums in Moscow university and Moscow Mining academy, establisher (together with V.I. Vernadskii and A.E. Fersman) of mineralogical museum in the Moscow Institute of geological survey (on the base of collections of Moscow university and Moscow Mining academy; now the V.I. Vernadskii State Geological museum of Russian Academy of Sciences). Decorated with Order of Lenin and the Badge of Honor.

In his honor mineral *smolianinovite* was named.

A friend, a teacher, a comrade, — so I remember N.A. Smol'yaninov. I knew him for many years, but got in with him when I became a postgraduate in the Chair of mineralogy in Moscow Institute of geological survey (MGRI). When a postgraduate, I was invited in 1941 to participate in studying the new-discovered fluorite deposit in the Zeravshan Range, Tajikistan. The journey we had to undertake would have been a hard one since the deposit was at 6000 meters above sea level.

It was also decided to visit the Kulikolon well-known deposit of optical fluorite as it was at the route of our expedition. To familiarize with this deposit was of great interest as it

opened the possibility of comparative studying the known and new-discovered deposits.
At the height of field season, we suddenly got to know by radio of Hitler's treacherous aggression against our country. The party was decided to stop working. The students engaged in practical works left immediately for Moscow; as to us, the Institute workers, we were ordered to go to Semipalatinsk where the Institute was evacuated by that time.
In Semipalatinsk, the building for the Institute did not do for educational process. The chair of mineralogy needed a training collection of specimens, a laboratory, textbooks, handbooks to identify minerals, but there was nearly nothing of this available. In these complicated circumstances, administrative ability of Nikolai Alekseevich Smol'yaninov proved out. The local geologists' resources were mobilized, blowpipes were made of glass or copper pipes, and a room for practical training was prepared... All the possible had been done in short time to begin a normal academic year. The lessons proceeded at three faculties, the teaching load was maximum, but there were only two persons in the chair staff: N.A. Smol'yaninov and an assistant lecturer, i.e. me. However, Nikolai Alekseevich held chair meetings as if the entire educational Moscow staff was present. And he used to summarize resolutions with the words, «The Chair supposes...» or «By the Chair's decision...», though, I repeat, there were two of us only.
Shortly, I got to know that during evacuation of the Institute, when the Germans were near Moscow, many documents have been burnt down including the text of my dissertation, «The Mineralogy of Akchatau Wolframite Deposit, Kazakhstan», that was prepared to be defended. One can easily imagine what a hard blow turned to be this news for me. Nikolai Alekseevich showed maximal attention, called me to be courageous, and suggested to restore the manuscript since the analytical data as well as the short report were passed in Alma-Ata, to the funds of Kazakhstan geological service. Though being fully busy, Nikolai Alekseevich watched tirelessly over my work, and, as soon as it was completed and reported at the regular chair meeting, the chair resolution of the work readiness to be defended was entered in the minutes. Later, I defended it successfully in the Tashkent Middle Asia University.
In 1943, MGRI returned to Moscow. The N.A. Smol'yaninov's administrative remarkable ability manifested here again. For the first time in our country, Nikolai Alekseevich began his course of mineralogy in accordance with the new crystallochemical systematics that was brought forward by Prof. Strunz in Germany. As a brilliant connoisseur of minerals, Nikolai Alekseevich was in the habit to give in his lectures a spacious material, which could not be found in any textbook. The mineral collection of MGRI that was headed by him for more than 20 years served an excellent illustration for his lectures.
An extraordinary event in N.A. Smol'yaninov's work was his discovery of scheelite, a valuable tungsten-containing mineral, amidst specimens of an old and non-ordered collection from Chorukh-Dairon, Tajikistan. One should clear up whether this was a casual find or scheelite is widespread in this deposit. With this aim, the Chair equipped a special party that confirmed the fact that there are industrial reserves of scheelite in the Chorukh-Dairon deposit. Just so a new deposit was discovered of this valuable mineral.

Yurii Aleksandrovich Bilibin

Born 19 May 1901, died 4 May 1952.

Geologist, specialized in placers, petrologist, initiator of home school of metallogeny, corresponding member of the Academy of Sciences of the USSR, professor, head of the Chair of ore minerals of the Leningrad State university, head of the sector of metallogeny of VSEGEI, head of the East-Siberian expedition of Academy of Sciences, one of initiators and head of the First Kolyma Expedition of 1928—1929. State Prize winner.
In his honor were named: mineral *bilibinskite*, range in the Cherskii Mountain system, Bilibino township in Magadan oblast', streets in Magadan and Aldan, and mine in Magadan oblast'.

The acquaintance with Yurii Aleksandrovich Bilibin took place in the autumn of 1942 in Tashkent, soon after my candidate dissertation defense at the Middle-Asia University. Earlier, I only knew Bilibin by his very interesting works on geology of the North of our country.
We got acquainted at the «Glavzoloto» office. Yurii Aleksandrovich turned to be an amiable, big, and tall person. I had got to know soon that he was offered to work as chief geologist at the Koitash rare-earth deposit of scheelite near the Samarkand City. As there was no geological service at this mine, Yurii Aleksandrovich offered me to work as a mining geologist. It would have been of great interest to work with this prominent scientist, and I gave my consent.
When I arrived at the mine, Bilibin already lived there with his family: Tat'yana Vasil'evna, his wife, and Sasha, their newborn son. Yurii

Aleksandrovich familiarized me promptly with the deposit geological features. I was amazed with his shrewd observation. For instance, once he saw an inappreciable stripe of bare earth in the grass cover; it was, by his opinion, a surface trace of a fracture zone. Later, this fracture zone was actually established during the deposit mining.

The disposition towards humor was Yurii Aleksandrovich's characteristic feature. There was no forest in the deposit vicinities, only sparse odd bushes. Kizyak, pressed dung, served the only fuel. Bilibin once reported: he found a large «deposit» of kizyak; however, someone had already been successful in taking off the «cream» of it.

As it was wartime, the wages were very low at the mine, so the administration permitted the workers to mine scheelite in off-duty time and to change it for foods, in particular, wheat grain. Yurii Aleksandrovich and me seized this opportunity. We carried bags with ore from the mountain and then washed it in a butara, a sort of washing drum. The grain exchanged for scheelite I drove to Samarkand where my wife and two-year-old son lived then with my parents.

Yurii Aleksandrovich was a remarkable narrator. His narrations of placer geology, gold deposits, some geological objects were interesting and amusing every time.

In 1945, Yu.A. Bilibin was elected corresponding member of Academy of Sciences of the USSR. Soon after the war finished, he returned to Leningrad. One day, answering to my new-year congratulation, he wrote me in a letter: «I only regret that, according to our tradition, as soon as the merits of a scientific worker are recognized officially, he is loaded with so many duties that becomes unable to engage in his scientific work...»

It was said that Yurii Aleksandrovich's lectures were so interesting that they were attended not only by his students but also by the lecturers.

The MEMORY (instead of epilogue)

The memory! Like a time machine, it carries you instantly in the past, and you begin to live again in that remote time that fell into oblivion long ago. And if you hold in your hands an object retained from those times, this sensation becomes especially realistic...

As a mineralogist, I always wished to retain for memory a small specimen of a mineral or rock from those distant lands where my life brought me. So a dozen of specimens was accumulated, the witnesses of remote times. Each one is connected with some kind of event, and that is why every one is dear to me.

For example, here is a scepter quartz crystal. It was brought from post-war Kazakhstan where I came across it at unusual circumstances.

The year 1949... The time of restoration after the post-war devastation, of putting deposits into operation and reconstruction of old, disabled ones. I was offered to be at the head of Kazakhstan inspection party and to conduct, at the same time, searches for new deposits.

We were threading on our truck by the Betpak-Dala desert to the site of forthcoming work. It was terribly hot, and to find a place for a camp was not easy. However, we suddenly saw on the horizon a small oasis of abundant greenery. Of course, we hurried there.

A geophysical party settled shortly earlier under the fresh shade of trees; they led systematic large-scale survey of the region. Having had pitched, side by side, our tents and also a big canvas canopy, under which, later, collected materials were being treated and food cooked, we outlined the plan of the works to be fulfilled. Thereafter I decided to go immediately in my own reconnaissance rout.

It should be said that our camp was situated aside of the former granite massif that had turned into an almost even granite field under the influence of constant winds, heat, sandstorms, and wild frosts in winter times for millions of years. I went just to this massif taking with me my knapsack, geologist's peak, and compass. In some three kilometers from the camp, in a pile-up of granite blocks, I found a large enough pocket — a vug with its sides covered with crystals of scepter quartz. The best, well faceted and transparent, crystals were unapproachable, and I felt the natural desire to obtain them. But the crystals prevented me from penetrating into the pocket by the usual way, i.e. feet-first. So I decided to creep into the vug with my head first. My attempt had been successful, and the pocket turned to be more capacious than I expected. In my excitement, I began to break off the best, most spectacular specimens. But after my mineralogical appetite had been satisfied, it became clear that it was not so easy to get out from the rock bag: those fine crystals that I liked so prevented me now from getting out. They stuck into my body like thorns and inflicted acute pain. Only after many attempts, I managed to scramble out of the trap having had compacted my body to the full breathing out. Covered with bleeding scratches, chivied, but with the happy

phiz and the knapsack filled with trophies, I reached at last the camp.

Having rested and put myself in order, I started to examine the specimens obtained so hardly. Scrutinizing the quartz crystals and granite pieces, I noted diminutive transparent bladed crystals that resembled very much bertrandite, a beryllium-containing mineral. Their composition was confirmed by spectral analysis. So the massif should be explored, and this work promised to be interesting.

Further studies confirmed unordinary beryllium mineralization of this massif. They had led initially to the discovery of a system of thin veins with bertrandite and helvite. As a result of prospecting in the shale, the five quartz-hematite-helvite lenses were stripped about 10 meters in size containing more than 30 per cent of helvite. That was a new, not known earlier, type of hydrothermal genesis. But the most surprising were the lens edgings up to 10 cm thick. The constituting mineral resembled fine-grained amazonite feldspar, but being studied in detail, turned to be beryl!

Do you know what means «uzunkulak»? In uzbek, it is «long ear», something alike wireless telegraph. You depart somewhere from the camp, and, virtually, nobody knows your way; but when you reach your destination, the whole kishlak is already aware of your arrival. We got to know uzunkulak operation from our own experience. Soon after we made our interesting finds, the automobile drove up to our camp with a group of geologists from the Kazakhstan Geological service headed by academician F.V. Chukhrov. And then... We were being literally assailed by the planes of geological service. They used to land nearly our tents, a pile of probes was being thrown out upon the ground, then appeal to consult the accompanying geologist followed. They were the most extraordinary consultation in my life.

In autumn, we sent to Moscow 40 boxes of the valuable load. Alas, the specimens did not reach their destination. Evidently, the stones were not, to railroaders' opinion, of great value, and were simply thrown away. The searches were of no result... And only the quartz small specimen, which I hold in my hands, enables me to pass mentally into the hard-to-reach region of our works, and I feel myself again in that period of my life that is impossible to restore otherwise than in the memory.