D.I. DIAKONOV. SOME PERSONAL NOTES

Michael Semenov-Tian-Shansky

Institut Mathématique de Bourgogne, Université Bourgogne Europe
Dijon, France

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In this short note I recall my friendship with Mitya Diakonov against the background of the historical and political events of that time.

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It is very difficult for me to write about Mitya. He was my very close friend for about 40 years, since the time we were both studying at the Leningrad University. We got acquainted at the end of our first university year. As a matter of fact, we have both heard of each other from our adolescence, our families both belonging to that thin and fragile layer which is called old intelligentsia, but we somehow did not manage to meet before. And then finally, Mitya stopped me in the university corridor and said that he had heard of me and wanted me to become his friend.

One year later, in September 1968, I returned from a geological expedition in the northeast of Russia. On the same day, he quite unexpectedly invited me to attend his wedding. This was a terrible time for many of us, just weeks after the invasion of Czechoslovakia which had put a brutal end to our hopes for liberalization. At that time, we still believed in the possibility of building socialism with a human face, which now proved to be totally vain.

Our life in these years was a mixture of happy youth and bitter disillusions, on the background of what was later called the stagnation period of the Soviet history. After 50 years, I still remember the fascinating tea parties in the Diakonov apartment with their brilliant table talk dominated by the laconic remarks of the old Professor Diakonov, Mitya's father, a great historian and philologist, of the kind one would think about for the rest of the week. But above all, there were, of course, our studies of fundamental science. Mitya's early interest in quantum physics was triggered by a popular book written by a non-specialist, Daniel Danin «This Strange and Inevitable World». It was a rather successful attempt to explain to

non-experts the complexity of modern science and the dramatic search for the truth by the founders of new physics. Einstein, Bohr, Heisenberg were among Mitya's favourite heroes from his adolescence. Much later, already as a renowned scientist, Mitya had got a rare distinction to be invited, as a foreign resident, to the Carlsberg villa in Copenhagen, once occupied by Niels Bohr. He felt really stricken by this honour and decided to write a letter to Danin, then still alive in his 80s, telling him the story of his early choice of profession under the influence of Danin's book and the unexpected turn of his career. Danin, in turn, felt fairly happy and even wrote a newspaper article on this story.

In the late 1960s, when we were starting our studies, there were two main seminars in Leningrad which dealt with fundamental physics. The main one was, of course, the famous Theoretical Seminar at the Nuclear Physics Department of the Physico-Technical Institute (which was transformed into the Nuclear Physics Institute shortly afterwards). The Theoretical Seminar was presided over by V.N. Gribov (who also gave us an exciting course in Quantum Field Theory, with the emphasize on the analytical properties of scattering amplitudes, Regge behaviour, *etc.*). It was famous for its highest level, but also for its rather tough tradition (that of putting the speaker on trial), going back to Landau and perhaps to Pauli. Giving a talk in this seminar was a great challenge and required a good deal of self-confidence, which many of us were of course lacking. Another one was the newly created Faddeev seminar, which had started as a modest student seminar and gradually transformed into a full-scale research seminar. Affiliation to one or the other of these seminars was an important choice for the beginners which eventually determined our future scientific life, and in fact our entire fate.

It is probably not a proper place here to expose the complicated story of both seminars and the associated scientific schools. They were quite different both in style and scope, and may be probably best described by a kind of complementarity relations. One important controversy was connected with the not-so-easy acknowledgment by the theorists of the Landau school of the new ideas pioneered by Faddeev, which also required a good deal of mathematics that was still unknown to old-style theorists. An attempt made by Faddeev himself to explain the possible role of solitons in Quantum Field Theory (on the example of the sine-Gordon equation) in the Gribov seminar ended up in a fiasco, and it took several years before his discovery had been finally acknowledged. Technically, Faddeev was dealing only with 2-dimensional toy models, but his enthusiastic vision had an important impact on young Moscow theorists, which resulted in the discovery of the monopole and the instanton solutions shortly afterwards. A few years later, the role of solitons in QFT became a common wisdom. On the other hand, the strong

point of the Gribov school was the deep (though not always faultless) intuition based on a profound knowledge of physics and a brilliant technique allowing to carry out tremendous calculations. In the late 1960s and early 70s, the Gribov school was still under the impression of Landau's concept with its deep mistrust of QFT based on the Zero Charge paradox. Early observations which pointed to the possibility of the opposite behaviour (like the Gross–Neveu model explored by Mitia's teacher A. Anselm *avant l'heure*, already in 1959) were largely discarded. The situation changed dramatically with the discovery of asymptotic freedom in 1972; this finally brought about rehabilitation of QFT and the construction of a reliable perturbation theory of strong interactions. By that time Mitya was already among the front runners. In 1974, he prepared (together with M. Strikman) a translation of the famous book of Feynman on «Photon–hadron Interactions» in which the parton model was introduced; by the time of its publication in 1975, it became already clear that Feynmann's partons were identical to the QCD quarks. At that moment, the key problems of QCD, the quark confinement in the first line, were believed to be within quick reach. Mitya addressed all these problems with true passion. Among his numerous contributions to the field, I would like to mention the chiral theory of nucleons. Mitya's talk on this work in Faddeev's seminar (in the late 1980s) was absolutely brilliant.

In his later years, Faddeev used to say that he was feeling Mitya was probably most close to him among all the members of the Gribov school. In 2009, when the Nuclear Physics Institute was suddenly, and in a rather humiliating way, withdrawn from the Academy of Sciences and put under the rule of Kurchatov's Institute and its infamous director, Mitya seriously considered the idea of transfering his theory group to the Steklov Institute. At that time, the Academy of Sciences was still believed to be sort of a solid rock in turbulent times which were already at the doors, a belief which proved to be totally vain, as we know it now. Faddeev gave full support to this idea in his capacity of the Secretary of the Mathematics Division of the Academy of Sciences. But finally, Mitya decided to abandon the idea, which, as he felt, would be a kind of treason to his own institute.

Back in the 1980s, we had no real hope that the desperate situation in our country would ever change for something more decent in our lifetime. All of a sudden, this pessimistic vision proved to be false. Mitya said later that in his life there were two moments when he felt really proud of his country. One was in 1961 during the Gagarin space flight and another one in August 1991 when the anti-democratic putsch in Moscow had been defeated. At that time it seemed to many of us that the democratic forces had attained the "critical mass" and the happy future is already at the door. Ten years later, when we happened to discuss these historic events, Mitya was already much less optimistic, it became clear that the critical mass had not been

attained after all. In the 2000s, Mitya observed the situation in the country with growing anxiety. He still had a hope that a kind of joint action of the scientific community might allow to resist the onslaught of reaction which was becoming more and more evident. His idea was, in particular, to create an independent Union of scientific workers which would be able to raise voice in defence of science in the country. But already in 2010, he stated with some dismay that the current situation in Russia was unprecedented: the authorities manifestly did not want to listen to independent scientific experts and showed it quite openly. He was spared of seeing the sequel.

9 years after Mitya passed away we have entered a new period of our history. This story probably does not fit into the context of this note; we are effectively learning a rather unpleasant mathematical operation, multiplication by zero. Personally, I feel I am already not young enough to manage to see once again some light at the end of the tunnel.