Some Memories of Evgenii Feinberg

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1 Bangalore in 1983

The first time I met Evgenii Feiberg was at the 18th International Cosmic Ray Conference in Bangalore, India, during October-September 1983. I had become little interested in cosmic rays through contacts with Bjorken a few years earlier.

Evgenii was hard not to notice at the meeting. He was tall and had a kindly expression on his face. I learned much later that his friends thought he looked like Ronald Reagan, and Evgenii was proud of this. He also spoke carefully with good diction – like an English gentleman with a Russian accent. I only heard Evgenii speaking, though, when he was speaking with groups. These were the days when Russian delegations to meetings were tightly controlled by nachalniks and back then the KGB instructed Russian scientists what they were and were not to do if in the some unfortunate circumstance, they were compelled to speak with a foreigner.

During this meeting, the Korean airliner – Flight 007 – was shot down over Kamchatka. At the time, like many non-Russians at the conference, I felt a certain self-righteous indignation I felt as Russian delegates were defending what had happened as a proper handling of an ambiguous situation. Now, I remember Evgenii suggesting quietly that we should consider how the pilot forced to make the decision must feel. If I remember correctly, the pilot of the plane that shot down the Korean airliner eventually killed himself. In recent years, with more experience in many arenas with deliberate terrorism

as well as institutionally sponsored accidents and political decisions that lead to results very different from those foreseen, moral outrage becomes less easy than it was then.

2 Bad Honnef

The next time I saw Evgenii was in September, 1984, at the 1st International Workshop on Local Equilibrium in Strong Interaction Physics, held at Bad Honnef. This meeting was organized by Prof. Richard Weiner of Marburg University. Richard has always had a fascination with hydrodynamical descriptions of hadronic collisions. This interest goes back to the Landau hydrodynamical model, which with a few judicious adjustments can phenomenologically describe a variety of aspects of hadronic collisions. I was brought up on the parton model, and from a QCD perspective, the Landau model defies attempts at rational understanding. It demands the stopping of very fast moving particles, and all we know about high energy collisions contradicts this.

I did not know it at the time, but almost all of the people there represented the Landau school of thought. Evgenii had done much work in this area. Peter Caruthers was at the meeting, and he too was a strong advocate of such thinking. Eduard Shuryak came together with Evgenii, and Eduard had at that time authored a number of papers about the hydrodynamical interpretation of pp data. In these papers, he had coined the word Quark Gluon Plasma.

For a variety of reasons, I became friends with both Evgenii and Eduard.

With Eduard it was easy since I had read his papers and admired his creative insight. This meeting offered me my first chance to talk with him. We also shared a mutual friend in St. Petersburg, Mitya Diakonov, who had highly recommended Eduard. Both he and Eduard were doing work on instanton description of hadronic physics, work which they both continued throughout their careers.

Eduard is an easy person with whom to form a friendship. First and last, he loves physics; He is also an honest and decent human being. Let me add as an aside of all my friends who left Russia, he was the only one who applied to legally immigrate. Even during the Gorbachov year this was not easy to do, and the risk was a major one. If you applied and were denied

you could expect to lose your job, yet be forced to remain within Russia. In other words, you could lose everything. In the time before Gorbachev, such refuseniks formed communities of intellectuals in Moscow and St. Petersburg, isolated from the rest of society. I was able to help Eduard by talking with Gerry Brown at Stony Brook and Sid Kahana at BNL, who arranged for him to have a job if he successfully left the country. All of this occurred much later, of course, and I had no premonition that this would happen when we first met in Bad Honnef.

Making friends with Evgenii was also easy: he was absolutely charming and seemed to me the most rational of those of the Landau hydrodynamical school. He argued that Landau hydrodynamics could describe the late time in a collision, but at early times was doomed to failure. His argument was that entropy production became huge if one extrapolated the hydrodynamical equations to the time of collision. Landau hydrodynamics assumes zero entropy production. His is a correct argument, and has the essence of the QCD approach, which requires that hydrodynamical equations can only be used at a late enough time so that the expansion time is long compared to the scattering time.

I remember talking with Evgenii one evening in the cafeteria about Extra-Sensory Perception. I had been reading that the CIA was doing experiments to see if one could show that such phenomena were true, and I knew that there was no reputable account of a positive result of any such experiments. I was intrigued nevertheless that the US should have devised such a secret research program, and I asked Evgenii if there was a similar program in Russia. He answered simply that there was in fact such a program and it had independently verified all the results of the American program. In other words, the idea was all nonsense.

I also had been working on a problem closely related to a seminal work of Feinberg. Together with Tuomo Toimela, I had been trying to find a general method for computing photon and dilepton emission rates at finite temperature and density. Much to my surprise, I discovered that Evgenii had already done most of what we had done in his classic work "Direct Production of Photons and Dilpetons in Thermodynamical Models of Multiple Hadron Production."[1] This is a very beautiful paper where he relates the total rate of photon and dilepton production to the imaginary part of the vacuum polarization tensor at finite temperature.

3 Evgenii in Moscow

One of the first times I visited Moscow, I went on a DOE sponsored group of scientists who were touring Russian labs. The group was led by a scientist who had little understanding of Russian culture or customs. I remember when we went to Novosibirsk, we arrived late and hungry. My wife Alice and I went down to the restaurant, and had already ordered when the others from our delegation arrived. They spoke no Russian, could not figure out to order, and asked me to help. I spoke minimal Russian, but enough to understand most of the menu. The problem was the menu was that of a typical Russian restaurant of those years. They had everything possible listed on the menu, but only a few items were actually available. (There is still a restaurant like this near Profsoyuvnaya in Moscow, which I still go to for old times sake.) The rest of the party ordered, but were incensed when the waiter returned to report that what they ordered could not be supplied. In the style that gives some American travelers a bad name abroad, the leader of our party first blamed the waiter for "refusing" to get what the the others wanted, then groused at me for not speaking Russian well enough.

That trip was an intense and memorable one. I would spend my days working with the delegation, and in the evenings Alice and I would visit friends in whatever city we were in. I would often get to bed at 4 in the morning and be up by 7. While in Novosibirsk, I got to know Eduard better and we met and his wife. We also made another lifelong friend, Iulik Khriplovich.

While in Moscow, we stayed at the Intourist Hotel. I remember once we were getting ready to go to some function associated with the delegation. Alice, who at the time was negotiating with the publisher that the following year issued one of her children's books in Russian, had been trying without success to dial a phone number of one of her own contacts. "Let me try," offered the helpful Russian guide accompanying our delegation, someone never overtly identified as a KGB man. Without asking Alice the phone number, he simply dialed and connected with the number Alice wanted. He had noted and memorized the phone number as she was dialing it – from across the room where he had been standing!

When we visited the Lebedev Institute, I saw Evgenii and we arranged to have dinner together. We tried several restaurants in our hotel, but they were all booked for other things. The only one we could get into was one

with a noisy band playing rock music, and we could barely hear one another. When we ordered dinner, we discovered they only had two items on the menu: Champagne and Black Caviar. I ordered those, and they brought us huge buckets filled with caviar and a couple bottles of champagne. It cost almost nothing.

The next time I was in Moscow, I visited Evgenii at his home. This was in the time before Gorabachev had ruined the Russian currency, and scientists lived relatively well. At his home, I met his wife, who was a scholar of American jazz. She spoke excellent English, and asked me all sorts of questions about what life was like in the US. I discovered that she had grown up in the US, and that the age of 18, immigrated to Russia. Her father was an Aremenian immigrant and leftist, who at some time during the Stalin era had returned to the Worker's Paradise. Not too late afterwards, he was murdered in the camps.

His wife seemed to me lucky to have survived and built the interesting life she enjoyed in Moscow with Evgenii. In Finland, I had heard many stories of American families who immigrated to Russia during the Stalin era. The parents would be taken to the camps where they were killed, and the children isolated. Some of the children were of use for their language skills and were recruited into the intelligence services.

In any case, I found his wife absolutely charming, a woman – like my own wife – of boundless energy and enthusiasm, full of love for life and optimistic in any situation.

4 Later Visits with Evegenii

I visited Moscow and met Evgenii several times during later years. As time passed Evgenii aged. During the later part of the Gorbachev years, due to the devaluation of the ruble, he lost his life savings. This was a tragedy for his family, since his daughter was handicapped and needed care. But Evgenii persevered. I never heard him complain. He like his wife was an optimist about society, science and human nature. He eventually lost his beloved wife as well.

He kept working, as the good scientists everywhere do. Fortunately, in Russia long as you are a member of the Russian Academy of Sciences and active, you can survive. Evgenii's life could continue in the association not

only within the scientific community but also – because his cultural interests were such broad ones – in other circles of the Russian intelligentsia.

His work during these years was in trying to understand the phase transition between hadronic matter and the Quark Gluon Plasma. He proposed an intermediate phase with unbroken chiral symmetry and constituent quarks with masses.[2]

I was glad to continue to see Evgenii at several international meetings. My wife and I visited him at his home after the first meeting in honor of the memory of Sakharov. Alice remembers his telling us about the day of his friend's funeral. All Russians mourned Sakharov's loss, he said: on that day "even the policemen were kind."

The last time I saw Evgenii was at another of the Sakharov meetings held at the Lebedev Institute. His 90th birthday was celebrated at that meeting.

5 General Impressions

Evgenii is one of those rare people who have broad interests in science and culture. By his very nature, he was incapable of lying, or hiding his true feelings. Even as a man in his late 80's, and early 90's, he was full of energy and vitality.

Evgenii was also a man of honor and strong principle. During the Sakharov dentention Evgenii supported Sakharov, and found ways of taking care of his friend. These were not easy times. Nevertheless, Evgenii always most valued honor, truth, and science. He was someone whom I admired greatly.

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References

[1] E. Feinberg, **Nuovo Cimento A34**, 391 (1976).

[2] O. Chernavskaya, E. Feinberg and I. Royzen, **Phys. Atom. Nucl. 65**, 161 (2002).