

# THE BLESSING OF THE SUPERSTAR

I met Stephan Prokofievich Timoshenko in Moscow in the early Fall of 1963. It was unforgettable! At that time, this Father of the US engineering mechanics was a real legend in the Soviet Union. His classic books became the usual manuals on my desk as well as on the desks of millions Soviet students and engineers. Timoshenko was a real superstar of engineering mechanics of the 20th century.



Stephan Prokofievich Timoshenko

The meeting happened in the office of Vadim Vasilievich Sokolovsky who was a Corresponding Member of the USSR Academy of Sciences and the Head of the Department of plasticity in the former Institute of Mechanics of this Academy. The Institute located on the Leningradsky Avenue was later reformed and resettled on the Vernadsky Avenue where it is now. Besides, Sokolovsky was the Head of the Plasticity Chair in the Moscow Institute of Physics and Technology which I graduated from in

1960 with a MS degree in the aerospace engineering, with Grigory Isaacovich Barenblatt being the supervisor of my diploma thesis. My scientific activity started on in 1957 when as a student of Sokolovsky I solved one difficult problem of heat conductivity suggested by his deputy---and Vadim as we students called him recommended to publish it in the journal of Applied Mathematics and Mechanics.

In 1962, on the Faculty of Mathematics and Mechanics of the Moscow State University I defended a dissertation, similar to the PhD thesis in USA, on elastic-plastic problems. Later, in 1964, at the Institute of Mechanics of the USSR Academy of Sciences I defended also a dissertation on mathematical problems with unknown boundaries for the degree of Doctor of Physics and Mathematics which was the highest rank degree in USSR, not available in USA. At that time, I was the youngest of this rank in the Soviet Union.

I should recognize that in spite, and maybe because, of my age I was very ambitious and on all conferences and meetings sat always in the first line, together with famous old academicians. This was caused by a simple reason: by that time I solved many hard problems in physics and math very famous scientists tried to solve but could not. These are some non-linear Riemann and Hilbert problems of math and some physical problems including: hydrodynamics (on cavitation, underwater wings, bi-and-tri-plan wings etc), elastic-plastic problems (for slits, holes etc), diffusive combustion, fluidization of particulate beds in chemical technology, local buckling of plates, optimal design of structures, fracture mechanics, and others. (See, Genady P. Cherepanov, "Invariant Integrals in Physics", Springer, 2019, 260pp for the current developments of some ideas of those years.)

Many of these problems were earlier under siege of L.A.Galin, V.V.Sokolovsky, L.I.Sedov, Y.B.Zeldovich, L. Prandtl, D.I.Sherman, E.Trefftz, M.V.Keldysh, F.A. McClintock, F.D.Gakhov, G.R.Irwin, J.D.Eshelby, N.I.Muskhelishvili, and others. Most of these men were generous to bear my success but Zeldovich who became mad when I solved his equations of diffusive combustion ( as my friend Yura Riasantsev told to me). Zeldovich said:

"This Cherepanov pokes his nose everywhere!"

And he ordered to my then-friend and mentor Barenblatt:

"Stop writing papers joint with Cherepanov! You have already done six or seven papers joint with him!"

I tell all this to emphasize that I was not a first-timer in science at the time I met Timoshenko. It was his extraordinary fame and authority that caused my excitement and admiration.

And so, when I returned to the work after my summer holidays in Crimea, I dropped in the study of Sokolovsky and saw an old man sitting there before the desk of Vadim.

Vadim said:

"Hey, Cherepanov, come in!"

Then, he applied to the old man:

"This is Cherepanov who solved the two-dimensional elastic-plastic problem for the plate having a circular hole. It is the analog of the problem Galin solved earlier for the plane strain."

And Sokolovsky added applying to me:

"This is Stephan Prokofievich Timoshenko."

I remembered that several years ago when I was a student of Vadim's Chair in the Institute of Physics and Technology Vadim was on leave in the United States where he worked as a visiting professor at the Timoshenko's Department---and an associated professor who was a Vadim's former student delivered his course of lectures on the

theory of plasticity. Sokolovsky met and worked with Timoshenko in America, at least, twice. And I guessed they were good friends.

It was the great man who in the 1920th brought engineering mechanics to America like Chaikovsky who brought symphonic music to the USA in the 1890th.

The old man stretched his hand to me. It was strong and hard as a wood. I don't know why but it seems to me I feel this handshake up to now. It is because my senior friends, Galin, Sokolovsky and others, never shook my hand despite our warm relations.

Probably, because of a very large age difference.

I stood at attention as a soldier before a general and listened to his complimentary words:

"Congratulations, young man! This was the problem many people tried to solve but without a success. I know that Trefftz, Prager and Hill tried to solve it. And me, also. However, it appeared too hard for my teeth to bite. Maybe, you Vadim could solve it?" Timoshenko spoke the perfect Russian, without any Ukrainian accent.

{ Later, I asked Sokolovsky how perfect was Timoshenko in mastering various languages and he said:

" Timoshenko speaks English, and a little bit Ukrainian and Serbian, with a strong Russian accent. He calls himself a Russian because he was grown and educated in Russia at the time when most people called Ukraine Malorussia, i.e. Little Russia,--- Ukraine was then a province of Russia. Timoshenko like the famous writer Gogol is accepted by all as a Russian." }

Vadim answered vehemently:

"No! He used complex variables. Very intricate. I asked him to write his solution in real variables. And I will include it in the next edition of my book "Plasticity"."

The second and third editions of his classic treatise included this solution of mine written in real variables.

We spoke a while, then. More accurately to say, they spoke between themselves, and I only said yes sometimes when they applied to me.

This meeting is imprinted forever in my memory. It produced an indelible influence of this great teacher upon me. By paraphrasing poet Pushkin, I would say:

"The old man Timoshenko paid heed to me quite rare  
And gave me his blessing while going to the grave."

He was then 85.

This happened about 57 years ago---but seemingly, only yesterday.

G. P. Cherepanov  
January 18, 2020

Literature used in this memoir:

Genady P. Cherepanov, "The Battle of Science: Moscow, the 1960th ", Vestnik of the Samara State University, a Series for Natural Sciences, No. 2(68), 2009, pp198-220.  
Genady P. Cherepanov," The Discussions and the Scientists", Man's World (Mir Cheloveka), the History of Science and Engineering, Vol. 8, No.4, 2008, pp 150-185.