Never lie against truth

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NEVER LIE AGAINST TRUTH

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Abstract: This is a short tribute to Aleksandr A. Borovkov on the occasion of his 80th birthday.

Keywords: probability, statistics, queuing theory, limit theorems

March 6, 2011 is the 80th birthday of Academician Aleksandr Alekseevich Borovkov.

Any jubilee for the person celebrating is a rather sad occasion, but a reason to look back, evaluate his accomplishments, recall what he went through, and ponder about the future. For the others a jubilee of a distinguished scientist is not only an opportunity to thank the colleague for what he did for each of us, but also a reason for thinking about science and the people who keep and create knowledge, bearing responsibility for it before the future generations.

Borovkov was born in Moscow. His father Alekseĭ Andreevich was an outstanding aircraft designer. He contributed to the development of retractable undercarriage for the I–16 fighter that went into mass production. Jointly with A. F. Florov he designed four modifications of the UTI training fighters and worked on the first Soviet jet fighter in the experimental design bureau of I. F. Bolkhovitinov. Aviation history notes an original project of a plane with pushing propeller and ramjet boosters, known in the West as the Borovkov–Florov D.

Since childhood, Borovkov dreamed of repeating the path of his father and going into aircraft design. The early death of his father in a plane crash in 1945 interfered with this intention. A second obstacle for the realization of the youthful dream was the assignment to a special group of the Mechanics and Mathematics Faculty at Moscow State University and the subsequent draft into a secret deciphering unit of the Soviet Army. It was there that Borovkov became involved in probability and statistics which since then have become his principal occupation.

Dismissed from the Army, Borovkov entered into graduate education in the Steklov Mathematical Institute. His scientific advisor was A. N. Kolmogorov. In 1959 Borovkov defended his thesis for the degree of a candidate of sciences, and Kolmogorov recommended him to S. L. Sobolev for heading the laboratory of probability and statistics at the Institute of Mathematics of the Siberian Branch of the USSR Academy of Sciences which had been founded near Novosibirsk those years. For half a century already the creative contribution of Borovkov has been stemming from Siberia.

Mathematics is the study of the most general forms of objective thinking, providing standards and tools for other branches of science. Mathematics became the logic of thought. We have to understand that logic can be different. The special place in modern science is occupied by stochastic reasoning.

Certainty does not belong to people. The world around us is so complicated and diverse that we cannot ignore the deficiency and randomness of our knowledge and observations. The man lives in the world of chance. To see the patterns behind our own ignorance is the task of probability and statistics. Luckily, the ignorance is versatile and homogeneous: the mankind encounters a plentitude of the independent random variables that are by and large identically distributed due to the universal gaps in our knowledge. A human weakness—ignorance—turns into the power of limit theorems and the law of large numbers.

Modern stochastics is often positioned as a branch of measure theory. This is somewhat imprecise. Measure theory goes back to geometry which grew out of the legal procedures requiring complete definiteness and unambiguity in application. Aristotle's logic followed geometry and reflected its methodology. Probability has its roots not in jurisprudence, but in the procedures of soothsaying and fortune telling, which means predicting the future from random or mystical experiments.

The probabilistic and deterministic views of the world are the two sides of human's thinking. The peculiarities of mind are distinctive of people as a population; they are eternal and will never disappear. Partially the relation between the deterministic logic and randomness was revealed by George Boole in his brilliant book entitled *An Investigation of the Laws of Thought on Which Are Founded the Mathematical Theories of Logic and Probabilities.* The new approach of A. N. Kolmogorov that revolutionized probability and mathematical rested on Boole's ideas. The measure-theoretic approach enriched the ways of thinking and scientific methods related to deterministic deduction and stochastic trial. However, complete understanding here remains far remote, and we still must work out a new outlook whose elements we encounter in modern physics, logic, and stochastics. The role of probabilistic reasoning is underestimated. The mankind is in the very beginning of a better and more complete understanding of the nature based on quantum mechanics and quantum logic, on the diversity of topos formalisms, on variable, fuzzy, and stochastic conceptions and patterns.

The main scientific achievements of Borovkov are related to the limit theorems of probability theory, including boundary problems, behavior of large deviations, and the so-called functional limit theorems. He contribute to the ergodicity and stability of random processes, stochastic queueing theory, the asymptotic methods of statistics, the analysis of multidimensional Markov chains, and many other current branches of modern stochastics. For over half a century Borovkov is one of the best sherpas on the tortuous path to the new frontiers of scientific thought.

Borovkov is a heir of the legacy of the Moscow mathematical school. He is a student of Kolmogorov's, who was a student of Luzin's. One of the best traditions of Luzin's school is the unity of research and teaching. Any scientist is both a student and teacher. Therefore, a pathetic scientist is a pathetic teacher and a pathetic student, while a great scientist is great both as a student and as a teacher. Schools and only schools turn the laborers of science into the genuine scientists, the scientists by belief.

Science serves truth, and so the scientists serve truth as well. "Truth above all," "nothing is more beautiful than truth," and "worship only truth" are the blessed mottoes of the teachers of the past.

The repugnant crime of a scientist against science is the loss of objectivity. It is hard to imagine and accomplish anything more adverse to science than to "lie against truth"—to willingly abandon facts and logic, distorting the reality by subjective reasons beyond science.

Science is not a moral regulator, but to serve truth is a moral duty of every scientist. Misdeed is alien to any scientist by belief. Unfortunately, there are much more ways to betray truth than the paths leading to it. To be a scientist by belief is a state not certified, not compulsory, and rather rare for a man of science. Everybody knows how volatile and instantaneous are his everyday dispositions, and how flexible are his moral judgements. What is human takes priority: own interests and next of kin prevail, and not unreasonably, in our judgements and actions over the strict and cold beauty of inaccessible truth. Yet more valuable and important are the moral examples of steadfastness and adherence to principle in upholding truth.

Textbooks by Borovkov are tremendous contributions to our country's and world's mathematical culture. Borovkov is the founder and recognized leader of the Siberian school of probability and statistics. Borovkov is scrupulous and uncompromising in regard to his own research and that of his students. The life of Borovkov demonstrates that protectionism in science is not a compulsory phenomenon.

Borovkov is faithful to science and has never betrayed it. Borovkov is a great scholar and an honorable man. It is impossible to overpraise a man at eighty. We can be proud of his successes, sympathize with his difficulties, and thank him for what he did for us. We wish Aleksandr Alekseevich good health, happiness at new accomplishments, and pleasure in the diversity of life. Let his students be worthy of their teacher.

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