LETTERS TO PROGRESS IN PHYSICS

In Memoriam of Simon Shnoll (1930–2021)

Dmitri Rabounski
Puschino, Moscow Region, Russia. E-mail: rabounski@yahoo.com

Simon Shnoll passed away on September 11, 2021 being 91 years old. He was born on the vernal equinox, March 21, 1930, and was one of the few greatest biophysicists of the 20th century, as well as a very good open hearth person. I have known him closely for many years. Here I want to pay tribute to his memory and his outstanding achievements in science.

Simon Shnoll was born on March 21, 1930, the day of vernal equinox, in Moscow, the USSR. His father Eli Shnoll was a religious philosopher belonging to the Russian Orthodox Church (as well as a polyglot who was fluent in more than twenty languages). In 1933 his father was imprisoned for his faith, together with many hierarchs of the Orthodox Church, to the prisoner camp on the Solovki Islands, but after three years of jail, in 1936, he was released as hopeless ill then died shortly before World War II. His mother Faina was a school teacher. His parents were religious; they had four sons. On the contrary, Simon Shnoll grew up an atheist; he told me many times: "My father was a religious philosopher and was fluent in twenty languages, while I know only one language and do not believe in God, but I believe in the Saints who lived in the past and those who live among us."

Simon Shnoll spent his childhood in Kaluga, a city on the Oka River, 160 km south-west of Moscow, where his family lived in exile. Due to job restrictions, his mother was largely unemployed: his family survived on odd jobs. Simon started to work commencing his 6 years as a herdsman in the summer season. His family experienced hunger; his youngest brother died in baby age of hunger in Autumn, 1941, because his mother lost milk due to hunger. Simon Shnoll always told me that only a person who has survived many years of hunger and watched how people have no power to bury the bodies of their relatives can understand the divine aroma of a freshly cooked loaf of bread.

Simon Shnoll first visited the Puschino area being an 11-year-old boy, in the summer of 1941 in search of casual work in the fields on the northern (low) bank of the Oka River opposite Puschino (located on the southern bank, at an altitude of 190 meters). There was a rest house for the officers' school cadets and a beach. Simon decided to freshen up in the river with the cadets who were sunbathing on the beach, but got into a whirlpool that sucked him weakened by hunger, and he began to drown, screaming for help. The cadets, these athletic young men, pulled him out of the river by the hair and, looking at his very skinny body, fed him as best they could. All these cadets were killed in action three months later, in October, 1941, on the fields near Moscow, when, armed only with rifles and grenades, they tried to stop the German tank columns moving towards Moscow (but they did it). The bridge near Puschino across the Oka River connecting Moscow and Tula is named after them.

Simon Shnoll. Puschino, about 2005.

The battleline very quickly approached Moscow, and at the end of August 1941, when 11-year-old Simon was grazing cattle in the fields on the northern (low) bank of the Oka River, he suddenly saw a chain of small fountains of dust rising from the ground and quickly approaching him, and then he heard pops shots from above: it was a German fighter pilot who decided to "hunt" a boy among a herd of cows... Simon first ran in a zigzag among the cows, then stumbled, fell and waited for death, but the German pilot used up all his ammunition and flew away.

When Simon returned back to Kaluga, there was chaos due to approaching the battleline. In the early morning of October 12, 1941, a military commissar knocked the door of Shnoll's room. The commissar went around all the civilian residents in their borough and told them: "Go away, today the Germans will come and kill you all." He was kind enough to help Shnoll's mom and all her four children get to the train station and then put them on the last train heading towards Moscow. His prediction was prophetic: within 2.5 months from October 12 to December 30, 1941, when Kaluga (50,000 inhabitants) was under occupation, the Germans killed more than 20,000 people in the ghetto and POW camp, including the captured soldiers and officers of the Kaluga garrison. A few years later, Shnoll's former neighbour, who moved to Moscow after the liberation, told him and his mother that, on their street, German soldiers often shot pedestrians just for fun, using them as targets for shooting training. Those were grey-dressed soldiers of Wehrmacht, and not SS. It was a bloody bacchanalia of war. . .

The refugees, including Shnoll's family were dropped off a train in a rural area far from Moscow, then Shnoll's mother and four her sons wandered around the villages of the Moscow region for a month in the cold autumn, begging for alms from the peasants. His younger brother, a baby, starved to death during this time. When Shnoll's mother with her three surviving children reached Moscow, they were allowed to stay there, because her husband, an "enemy of the people", had already died, so the restrictions on his family were lifted. Only 2.5 years later, in 1944, she found a permanent job as a teacher in an orphanage, where she and her sons could live and dine with orphans — "children of war".

The wartime in Moscow was accompanied by a surf of street crime. Even the immediate executions at the crime scene by police patrols could not stop the street robberies and murder. Once criminal teenagers who were older than Simon beat him to a pulp; they knocked out all of his front teeth. After this incident, Simon decided to take his fate into his own hands: he took a basic self-defence course from one of sports teachers. This saved his life many years later, in 1956, when the security officer who controlled Shnoll's work at that time, being completely drunk, tried to shoot him due to personal animosity. This happened in the forest on a river bank, during one of the trips of the laboratory employees to wild nature, near the campfire, where they all drank medical alcohol diluted half-to-half with water (they had much medical alcohol in the laboratory for biological purposes, while the laboratory rabbits were a good addition to the dinner table in the conditions of a total deficit of food products in the stores of the USSR). When the others were legless from the alcohol they drank, Simon Shnoll refused to continue drinking with the security officer, which sparked an outburst of his aggression. He told Shnoll: "I will kill you, and then all the Jews". Then he pulled his pistol out of the holster, sent a bullet into the pistol chamber and tried to shoot Simon. However, Simon turned him over with a judo technique, turned his hand with the pistol under his chin and. . . did not fire. Simon explained to me that this self-defence technique against an armed person necessarily ends with a shot to head: the fighter does not think, but automatically performs all these sequential movements, including the final headshot, which is achieved by long term training. But — said Simon — something stopped him at the last moment and he did not take the mortal sin of murder upon his soul. Simon stunned the security officer with a blow and then, having unloaded his pistol, threw all the bullets into the river. The security officer had a lot of respect for Simon after this incident.

Prior 1944, Simon Shnoll had never visited school. In Moscow, in 1942–1944 he worked as an electrician's assistant boy. In the meantime, he was educated at home by his mother, who was a very educated person. As a result, in 1944, being a 14-year-old boy, Simon Shnoll passed the 9th grade exam and graduated from school in 2 seasons in 1946.

In the summer of 1946, being 16 years old, Simon Shnoll entered the Department of Biology of Moscow University. It was the first peaceful summer after World War II, when hundreds of thousands of demobilized young soldiers tried to enter in universities. The number of applications per one student seat reached several hundreds. To enter, you had to pass all the entrance exams fine. At one of the entrance exams, 16-year-old Simon Shnoll met the love of his life, Maria Kondrashova, who was then 18 years old. She told me how this happened. She and Simon got up from their desks in the exam room at the same time and gave their exam papers to the examiner. The examiner began to check their papers at the same time, while they stood next to his desk. She watched at Simon. He looked like a small, skinny chick. She told me that she immediately felt a strong desire to warm and feed Simon like a child. . . After checking their exam papers, the examiner looked at them and said: "Both of your exam papers are good enough, but his paper is much better!" She immediately said a reply, looking towards Simon: "What a buster!" Very soon after that day, they realized that they could not live without each other and remained together for 74 years until she passed away on June 11, 2020. They had a son and daughter, as well as many grandchildren.

Maria Kondrashova was a biochemist. She and Simon were graduated from the same Department of Biology, where they had the same teacher, Prof. Sergey Severin, who introduced them into science. Maria and Simon lived in a small room in a shared apartment with neighbours in Moscow until 1963, when they were invited to live and work in Puschino, to a new research institute called the Institute of Theoretical and Experimental Biophysics (a.k.a. the Institute of Biophysics), where each of them headed his own research laboratory. Like Simon Shnoll, she first got a degree of Candidate of Sciences (which is analogous to the PhD degree), then — a degree of Doctor of Sciences. She was also a Professor of Moscow University. In addition to many of her other scientific works, her last major work, which she conducted since the 1990s, was a method of total diagnosis of the whole body using the analysis of just one drop of blood. Her outstanding scientific discoveries and ideas are scattered across many of her scientific articles in Russian, often in a very succinct concise form and, therefore, little known to the scientific community. These results and the technologies she developed are still awaiting rediscovery.

As for her personality, I would call her a "commander" in spite of the fact that she was a very nice and intelligent woman in everyday communication, in particular with me. She quickly recognized the identity of people and then behaved with them according to their personality. I discussed this issue with her. She explained to me that in science there is always only one leader who created an idea and developed it, and all the others are only assistants. Otherwise, without a "strong hand" any business, even a very good scientific development, would quickly collapse. Therefore, she always considered those who helped her in her laboratory to be mercenaries. In particular, therefore, she did not have followers in science. Science is moving forward by the forces of bright individuals, of whom there are very few, and not by scientific teams, as many mistakenly think, — she explained. Any scientific team shines with the reflected light emitted by its leader, and as soon as this leader ceases to exist, his or her team "goes out", ceasing to do something new, because only an individual, due to the strength of his of her will, is able to generate ideas and do scientific developments.

As for Simon, her husband, she told me that he is not really the "nice grey-haired old man" I have known for the past three decades. In fact, he is a very determined and risk-taking person, capable of, for example, surviving alone in a wild forest or repelling a gang of armed robbers. His psychology — she said — is rather similar to the psychology of a 14-year-old teenager, since only teenagers are not afraid of death and do everything without thinking about the consequences. The advantage of such a psychology is that Simon Shnoll had his own, completely independent point of view on many familiar things both in everyday life and in science.

Let us go back to Simon Shnoll and his story. After graduating from the Department of Biology in 1951, Simon Shnoll was under risk to be sent as a private for 5 years of military service (like his elder brother, a mathematician, who served 5 years in Red Army after the graduation). It was possible to be free from military service if he was hired by an institution where positions were equated to military service. After two months of nervous searches, Simon Shnoll took a job in a research laboratory of the Department of Radiology of the Institute for the Professional Development of Physicians. The laboratory was directly subordinated to the Soviet atomic project and included both military and civilian doctors; they studied how high doses of radiation exposure affect animals.

Despite the high level of secrecy in the laboratory, there was a complete mess and irresponsibility with safety measures for the staff during the radiation exposure of test animals. As a result, one day Simon Shnoll got a lethal dose of radiation. The female doctor who examined him said he would definitely die from radiation sickness within one month and all she could do for him is to give him as much pain reliever as needed. It was a very sad month in his life. He was ready to die, but his body had overcame the sickness in some incredible way. Moreover, he told me that his body had fully recovered without any repercussions, including the reproductive function. He explained that radiation exposure may not always be fatal, while radiation poisoning is always fatal due to the small radioactive particles penetrated into the body and permanently exposing it with their radiation.

Following this incident, Simon Shnoll became unfit for military service, but he continued to work in the Department of Radiology of the Institute for the Professional Development of Physicians. Then, since 1959, he began to lecture on biochemistry at the Physics Department of Moscow University, where he began as an associate professor, and then a professor until his death.

In 1963, Prof. Gleb Frank, a biophysicist, a member of the USSR Academy of Sciences, as well as a very influential organizer of science in the USSR, invited Simon and Maria to continue their scientific research in Puschino, a new "academic" town just erected 100 km south of Moscow on the southern (high) bank of the Oka River near the radio astronomical observatory of the Academy of Sciences. There were no "outsiders" in the new "academic" town: the peasants of the small village, Puschino, which had been located on the site for the past 600 or 800 years, were deported (except only a few persons who escaped the deportation) just before the construction of the town began in 1959. The absence of "outsiders" in the town created a unique social environment consisting only of scientists (and a small number of builders). Gleb Frank provided Simon and Maria with personal laboratories at a new research institute called the Institute of Biophysics, where he was Director. He also conversated with the town administration about providing them with a 4-bedroom apartment on the 9th (upper) floor of a just erected residential tower, which was luxurious living conditions compared to the small room in the shared apartment, where they huddled in Moscow. These were the first two "settlers" that Frank invited to live and work in Puschino. Simon always told me that Maria was the "settler number 1", and he was "number 2". On the contrary, Maria told me that he was the "settler number 1", and she was only "number 2".

For Simon Shnoll, it was a return to the areas of his childhood on the Oka riverbanks. Simon and Maria moved to Puschino with Maria's mother, who volunteered to took care of their son and daughter, while Simon and Maria spent all their time in their laboratories at the Institute. These were the times of the USSR, when workers received salary regardless of the results of their labour. Therefore, the quality of building work was low. The very first rain revealed many cracks in the waterproofing layer of the roof above the apartment, where Simon and Maria lived. Since there was nowhere to wait for help, Simon made a fire in front of the house, on which he melted down more than a dozen buckets of bitumen, and then going upstairs to the roof with the buckets of molten bitumen (the elevator in their house had not yet worked), filled all the cracks in the waterproofing layer. Also, the common heating system in the town sometimes malfunctioned during the winter seasons so that their slippers and tights of their little children froze to the floor. Nevertheless, life improved year after year. Fresh air (as opposed to the air in Moscow), a view of the endless Russian expanses and of a natural reserve on the opposite northern (low) bank of the Oka River (the bison natural reserve), as well as weekly picnics in the near forest neutralized all troubles of their first years in Puschino. A few years later, Simon and Maria hired workers who built a house for them in a cottage village of biophysicists near Puschino. Simon got carried away with the cultivation of an orchard and growing potatoes, but soon abandoned this "agricultural hobby", when realized that it takes away almost all of his time and is incompatible with his scientific research.

Simon travelled to Moscow twice a week, where he lectured at the Physics Department of Moscow University. Then there was no rapid express bus connecting Moscow and Puschino and private cab services (as now), and, therefore, such a trip took many hours. Also, in Puschino, as almost elsewhere in the USSR, there was a shortage of food products in stores; even with enough money, people could not freely buy what they wanted. In Puschino, this situation was solved by the fact that each Institute had its own restaurant, where employees had breakfasts and dinners with all their family members. However, the supply in the Moscow stores was good. Therefore, Simon usually travelled to Moscow on the eve of his lecture day. Arriving in Moscow in the evening, he usually purchased two full carry bags and a full backpack of food, then spent the night at the Facility of Biophysics of the Physics Department. Then, in the morning and in the daytime, he gave lectures, after which, already in the evening, he returned by bus to Puschino.

The life and all scientific achievements of Simon Shnoll and Maria Kondrashova after 1963 and until the last years of their lives were associated with Puschino and the Institute of Biophysics, which they considered their home. Shnoll's laboratory was one of the largest at the Institute: he told me that at the years of rise, he had 67 employees who did what he said. Since 1963, the staff of his laboratory were bestowed 26 Doctor of Sciences degrees and more than 120 Candidate of Sciences (PhD) degrees. In addition, many other laboratories of the Institute were founded by his employees, who decided to start their own research in another field of biophysics.

However, the years often change people or, most likely, as Jack London noticed, we often do not see the hidden character traits of some persons, which then become apparent over the years. In the beginning, Shnoll's laboratory staff and their families usually went out on a joint picnic at a weekend in the nearby forest. Then this picnic "decayed" into several smaller picnics, the participants of which tried to ignore others. Then, 10 years after the founding of the Institute, some of his former employees stopped greeting him, meeting him in the town or in the Institute... Maria told him that these were not true scientists, but those who simply wanted to "get well" in life; they got everything they wanted from him — scientific degrees and individual laboratories — and now they no longer need him. Simon Shnoll told me that this poor fact deeply hurt his heart, as he considered all his former employees to be his friends. During the mass "exodus" of scientists from Puschino in 1989–1991, just after the Iron Curtain that separated the USSR from the rest of the world has rushed down, many scientists left Puschino for the USA and Germany. According to Maria, after those two years some Institutes had become 75% empty. Their daughter had already lived in Moscow. Their son left for the USA with his wife and their children (they lived with Simon and Maria in the same 4-bedroom apartment): Simon and Maria were left alone in their apartment... Their circle of close friends narrowed even more; among them were remaining Eugeny Maevski and Heindrich Ivanitski, who held heading positions at their Institute and always supported Simon and Maria.

Simon Shnoll at the dinner table in his laboratory.
Puschino, 2005.

However, it was in the early 1990s that Simon Shnoll's research got the most rise (from the use of personal computers). To understand this, it is necessary to go back to 1951, when he first drew attention to a phenomenon that much later, in 2005, I called the *Shnoll effect*.

In 1951, Simon Shnoll, who had just graduated from university, began working in a research radiological laboratory subordinated to the Soviet atomic project (see above). Among other things, he conducted experiments to study the interaction of radioactive amino acids with muscle proteins (this was the topic of his PhD thesis). He discovered that the rate of this (very stable) chemical reaction, measured in hundreds of consecutive very accurate measurements taken during one working day through the same short time intervals, has systematic deviations from the average numerical value, which are not dependent of the experimental conditions, but only on the local time of measurement. It looked as if some very fine noise, with its repeated minima and maxima, was superimposed on the measurements of the very stable rate of this chemical reaction. The study of this systematic noise, its fine structure and origin became the main scientific task of Simon Shnoll throughout his life.

Continuing these studies in the 1950s in Moscow and then in the 1960–1970s in Puschino, Shnoll found that this specific noise is present not only in measurements of the rate of chemical reactions in muscle proteins, but also in any proteins in general. Moreover, in the 1970s, he found this noise in any biochemical reactions that he tested. Even more, in 1970–1980s, he found this noise, with its specific minima and maxima, in any consecutive physical measurement that he tested or analysed, unnecessary biochemical reactions. For example, he found it by measuring the rate of alpha-decay and beta-decay of atomic nuclei. In general, he found the following: the more stable the signal was, the better this noise manifested itself.

When I first met Simon Shnoll in 1991, I asked him: "What should be measured to detect this noise and its fine structure?" He adjusted his glasses with his hand and answered me: "It does not matter what!"

It should be noted that registering the systematic noise in an experiment is only a small percentage of the whole problem. The main trouble is the processing of the measurement results, which allows you to "see" this noise and its fine structure. In the pre-computer era, when performing these experiments based on a sequence of measurements of a signal for one day, month, or year, you had to do the following. First, you had to manually create on paper a histogram of the measured numerical values of the signal for each measurement interval, say, for each interval of 15 or 30 seconds. This would result in about 2,880 hand-drawn histograms per day, about 86,400 hand-drawn histograms per month, and over 1 million hand-drawn histograms per year for 30-second measurement intervals (double the number of histograms for 15-second intervals). Then you had to visually compare all these histograms with each other to find the ones that match each other in their shape. And finally, you had to create a graph that shows when the found similar histograms appear according on the local time. In the pre-computer era, Shnoll was forced to limit himself to only analysing the results of measurements obtained within one or two days. Even so, he had to create over 3,000 hand-drawn histograms for each experiment and then visually compare all those hand-drawn histograms to each other. This is clearly an overwhelming task for one person. Dozens of his employees, mostly young women who graduated from Moscow University, drew these thousands of histograms by hand every day and then compared them with each other. It was a titanic work!

Things got much easier in 1997, when Edwin Pozharski, a young man from Poland, who, just graduated from Physical Technical Institute that is to north of Moscow (he was engaged in X-ray analysis of proteins), created a computer program allowing to create and analyse dozens and hundreds of thousands of histograms. In particular, the use of his program allowed to create and analyse histograms for measurements performed over a week, month and even a year. He created this program not for fame or money (he did it on a volunteer basis), but simply out of great respect for Shnoll and his research. His program has gone through many updates and is still the main working tool in the study of the Shnoll effect. Thanks to him!

The next 10 years of Shnoll's research after 1997 were the most fruitful. Using the computer program to create histograms and analyse them, he found that the discovered fine structure is manifested in any random noise, and not only in the random noises registered in biological and physical processes. In particular, he found the same fine structure in the random noise generated by a random number generator on a computer.

To summarize briefly the Schnoll effect, it is best to give a quote from my 2014 article*, where I already did it:

> "The principal error in understanding the Shnoll effect is that some people think it is a periodical fluctuation of the magnitude of the signal that is measured. This is incorrect, since the magnitude of the signal and the average noise remain the same during the long-term measurements done by Shnoll and his workgroup. Further, such processes are specifically chosen for the study that are very stable in time. Simply put, nothing allegedly changes in the experiments which continue during days, months, and even years. The subject of the measurement is the *fine structure of the noise* registered in stable processes.
>
> Every process contains noise. The noise originates due to the influence of random factors and satisfies the Gaussian distribution (i.e., the Gauss continuous distribution function of the probability of the measured value between any two moments of time). Gaussian distribution is attributed to any random process, such as noise, and is based on the averaging and smoothing of the noise fluctuation measured during a long enough interval of time. Nevertheless, if considering very small intervals of time, the real noise has a bizarre structure of the probability distribution function, which differs for each interval of time. Each of these real functions being considered "per se" cannot be averaged to a Gaussian curve. This is what Shnoll called the fine structure of noise and is the object of research studies originally conducted by Simon Shnoll, commencing in 1951–1954 to this day.
>
> So, the magnitude of noise is measured in a very stable process during a long enough duration of time (days, months, and even years). Then the full row of the measured data is taken under study. The full duration of time is split into small intervals. A histogram of the probability distribution function is then created for each of the small intervals. Each interval of time has

*Rabounski D. and Borissova L. General relativity theory explains the Shnoll effect and makes possible forecasting earthquakes and weather cataclysms. *Progress in Physics*, 2014, v. 10, issue 2, p. 63–70.

its own bizarre distribution function (form of the histogram) that differs from Gaussian function. Nevertheless, Shnoll found that "paired histograms," which have a very similar (almost identical) form, exist along the row of the measured data. That is, the histogram created for each interval of time has its own "twin" which has a similar form. The similar form was found in the histograms which were registered with the following periods of repetition connected with stars, the Sun, and the Moon:

- 24 hours = 1440 min (solar day);
- 23 hours, 56 min = 1436 min (stellar day);
- 24 hours, 50 min = 1490 min (lunar day);
- 27 days, 7 hours, 43 min = 39 343 min (lunar month);
- 31 days, 19 hours, 29 min = 45 809 min (period of the lunar evection);
- 365 days = 525 600 min (calendar year);
- 365 days, 6 hours, 9 min = 525 969 min (stellar year).

Also, aside as the similar forms of histograms, appearance the mirrored forms of histograms was registered by Shnoll with periods of:

- 720 min (half of the calendar/solar day);
- 182 days, 12 hours = 262 800 min (half of the calendar/solar year).

Shnoll called this phenomenon the "palindrome effect". It is one of Shnoll's newest findings: despite his having started the research studies in 1951, the possibility of the appearance of the mirrored forms of histograms only came to his attention in 2004. The "palindrome effect" was first registered in December 2007. Aside from these two periods of the "palindromes", a number of other palindrome cycles were found. However, certain circumstances have not allowed a continuation of these studies in full force yet.

As was shown by Shnoll after many experiments done synchronously at different locations from South Pole to North Pole, an appearance of the similar form (or the mirrored form) of the histograms does not depend on the geographical latitude, but depends only on the geographical longitude, i.e., the same *local time* at the point of observation. In other words, the Shnoll effect is manifested equally at any location on the Earth's surface, according to the local time, meaning the same locations of the celestial objects in the sky with respect to the visible horizon.

It is significant that the process producing the noise that we measure can be absolutely anything. Initially, in 1951, Shnoll started his research studies from measurements of the speed of chemical reactions in the aqueous solutions of proteins. Then many other biochemical processes attracted his attention. After decades of successful findings, he focused on such purely physical processes as alpha-decay and beta-decay of the atomic nuclei. It was shown that not only all the random natural processes of different origins, but even artificial processes as random-number generation by computer software manifest the Shnoll effect. In other words, this is a fundamental effect."

Shnoll told me that neither signal level nor noise level is actually measured in his experiments: their numerical values remain very stable during measurement. Only standard time intervals between adjacent measurements change with the periods that he registered. That is, signal level and noise level remain unchanged, while the "unit time interval" between adjacent measurements is not "unit" but changes according to the fine inhomogeneous structure of space-time, through which the observer, together with his laboratory and the Earth itself, travels in the cosmos. The observer's laboratory is located somewhere on the surface of the Earth, while the Earth's body revolves around its axis, the Earth revolves around the Sun, the planets revolve around the Sun, and the entire Solar System travels along its specific trajectory in the Galaxy… As a result, the observer together with his laboratory travels in the cosmos through the fine structured grid of the standard "unit time intervals", which is caused by the fields of the aforementioned rotating cosmic bodies. This motion of the observer leads to the fact that his measurements of everything are affected by the corresponding periodic changes in the duration of the standard "unit time interval" between consecutive measurements. The more stable the quantity that he measures, the more obvious the fine structure of the grid of time intervals through which he moves in the cosmos.

In other words, Shnoll believed that the fine structure of random noise discovered by him (a.k.a. the Shnoll effect) manifests the fine inhomogeneous structure of time itself*.

In 2007–2008, I was honoured to be the editor of Shnoll's book, in which he explained the entire story of his discovery, starting in 1951, as well as all the details of his experiments and experimental results obtained up to those years. Prior that time, his experimental results were scattered over many dozens of his fragmentary papers. He asked me to help him with the structure of the book: he drafted many chapters on different topics that needed to be somehow connected with each other and combined into a whole book. We spent many hours together discussing every detail of the book. The book was published in Russian in 2009, and its English translation in 2012.† To be honest, I was should translate his book myself, because I knew the subject of the book like no one else. But then I was so physically exhausted that Maria Kondrashova took pity on me and invited two women for translation. Now, I have a great regret about this missed opportunity.

*Shnoll S.E. Changes in the fine structure of stochastic distributions as a consequence of space-time fluctuations. *Progress in Physics*, 2006, v. 2, issue 2, p. 39–45.

†Shnoll S. E. Cosmophysical Factors in Stochastic Processes. American Research Press, Rehoboth (NM), 2012, 388 pages.

This obituary turned out to be very personal, far from officialdom. . .

I, like most residents of Puschino, often walk along the Green Zone, the main street of the town, which is a 1,700-meter forested boulevard that runs through the town and separates the Institutes from the residential area. This boulevard is framed by the Avenue of Science from the side of the residential buildings and by the Institute Avenue from the side of the Institutes. At the entrance of each of the Institutes, I see memorial plaques on the wall dedicated to the influential scientists of the Soviet period, members of the USSR Academy of Sciences, who worked in Puschino. In addition, several streets of the town are named after some of them. These influential people of the Soviet period were successful organizers of science, rather than outstanding researchers. Their scientific achievements were particular and had not changed biophysics or biochemistry as a whole, while the technologies they have developed (like any technologies in general) are rather the subject of industrial corporations than science: the task of scientists is to discover fundamental laws, which industrial corporations, if they deem necessary, can then use then to develop some technologies.

On the contrary, the Shnoll effect is a fundamental discovery. Understanding this fine structure of the pattern of time through which we, together with the planet Earth, travel in the cosmos, will undoubtedly change not only biophysics as a science and physics in general, but our entire understanding of the world. In this sense, Simon Shnoll is similar to Copernicus, who also once changed the entire understanding of the world. I therefore have no doubt that once the scientific community has evolved enough to understand the significance of the Shnoll effect, then the Green Zone, the main boulevard that runs through the entire town, will be renamed Shnoll Boulevard. This will be not only fair, because Simon Shnol will forever remain the most outstanding research scientist who lived and worked in Puschino, but also symbolic — Shnoll Boulevard, running as a narrow through the entire town of scientists.

Let his memory live for ever!

Received on September 28, 2021