



## Water is Money

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Science and Technologies: Inventions



A scientist from Izhevsk Valentin Shironosov together with a group of engineers invented multifunctional devices, which activate given properties of liquids. No invention in the world is analogous to this one. Being flooded with offers from foreign investors, the scientists from Izhevsk make futile efforts to find domestic ones.

By the estimate of the World Health Organization, practically all human diseases are caused by environmental deterioration due to the consequences of anthropogenic impact. Scientists all over the world are struggling with the problem of survival and life quality improvement. Technologies for this are created to meet two requirements: to reduce the impact of environmental crisis and restore the wellbeing of the environment.

In 1989 physicists Norman Ramsey, Wolfgang Paul and Hans Demelt won the Nobel Prize for the empirical evidence of the possibility to work with a separate cell, molecule, atom and electron: this resulted in the birth of molecular electronics and a breakthrough in the field of fundamental science and biophysics. They invented the so-called electrodynamic traps, which made possible to hold fixed and sort atoms and molecules. Humanity got an access to construction on the molecular level.

As far back as 1983 the graduate of the Ural Polytechnic Institute Valentin Shironosov defended a thesis in the magnetism subdepartment of the Physics Department at Moscow State University. The thesis proved that with help of resonance it is possible to manipulate cells, molecules and atoms a thousand times more precisely. He was given the instruments for selective work on the molecular level. Valentin Shironosov's discovery gave a powerful incentive to the development of resonance technologies with a coefficient of efficiency approaching 100%: they are virtually waste-free, cheap and ecological.

Shironosov's research and developments drew attention of the USSR defense establishment management. In 1991 according to the decree of the State Committee on Science and Technology money from the state budget was assigned to create resonance technologies for defense establishment enterprises. A group of engineers from Izhevsk and Valentin Shironosov organized a small-scale state-operated enterprise "IKAR". Keldysh Institute for Applied Mathematics, a government enterprise "Electromechanical Plant" (Izhevsk) and individual persons - Valentin Shironosov, Galina Shironosova and Victor Minakov - became its founders. Among the 17 largest research institutes of the USSR "IKAR" was involved in innovative activity for the defense establishment enterprises. After dissolution of the USSR and discontinuation of budgetary financing, only enthusiasts carried on their work in "IKAR". They confronted the dilemma: whether to give up the enterprise or continue the scientific research. Fortunately, their developments were multipurpose: they fit not only the defense industry, but also nondefense branches - agriculture, petrochemistry, medicine etc. Staff of the "IKAR" made a decision to adapt the technologies to "peaceful life" and earn enough money to continue the fundamental research.

## Shironosov, Valentin Georgievich

Born in 1953 in Kamensk-Uralskiy, Sverdlovsk region. In 1976 graduated from the Applied-Physics Department of the Ural Polytechnic Institute (UPI) with theoretical physics as a special subject. In 1983 defended a Candidate's dissertation on the topic "Pondermotive influence of electromagnetic field on ferromagnetics in a non-linear magnetic resonance environment" at Moscow State University. Worked at the Theoretical Physics Department of UPI, at biophysics subdepartment of the Izhevsk State Medical Institute, at the Physicotechnical Institute of the Ural branch of the Academy of Science, in the closed corporation SRC "IKAR", was the head of biomedphysics subdepartment of the Udmurt State University.

At present - Director of the Research and Education Center "Resonance Technologies" of the Udmurt State University, the head of students' design office "Resonance", deputy director for science of the closed corporation SRC "IKAR".



In 1994 "IKAR" won a silver medal at the international exhibition of innovations "Eureka" in Brussels for the development and production of therapeutic complex on the basis of resonance influence on a human body. The complex included equipment for aeronotherapy, hydrotherapy, ion therapy and EHF-therapy. More than 100 of such complexes are delivered to hospitals and clinics of Russia and the near foreign countries, physicians studied and underwent practical training in the "IKAR".

Their next step involved development and production (together with "LET", Co Ltd) of product line of unmatched multipurpose installation "Izumrud-SI". The installation purifies highly polluted water and brings it to normal drinking water requirements, freeing it from microorganisms and suspended matters. "Izumrud-SI" can make water of specified mineral composition and properties. Drinking water, detergents, disinfectant solutions and sterilizing fluids can be obtained on the basis of this water.

One more development on non-contact activation of liquids, which is also second to none in the world, has proved both theoretically and empirically, that with the help of resonance influence it is possible to activate beneficial properties of any liquid (water, milk, petrol, medicinal agents etc.). In 2003 this development won a silver medal at the international exhibition "Eureka" in Brussels, and in March 2004 - a gold medal at the international show "New technologies" in Geneva.

### **A Glass of Pure Water**

***- Valentin Georgievich, the problem of pure water is one of the pressing ones practically in all the regions of this country. Do you offer its prompt and low-cost solution?***

- The water in our country is chlorinated and treated with aluminum sulfate. The more water is polluted, the more chloride of lime is added to it. But it is not safe, as harmful substances arise in this case. Bacteria stay alive, metals and toxic salts remain. Shall we drink spring water? Who can guarantee, that it is safe? In Izhevsk, for instance, practically in all the springs not only microorganisms, but also heavy metal salts were found, which remain even after the water is boiled. Sanitarians find microorganisms even in artesian wells at the depth of up to 100 meters underground. Artesian boring is also not a solution due to the fact that in this case a sanitary zone of 100 - 300 square meters will be required with no dogs, cars and pedestrians allowed. Such strict rules are not adequate for a big city. Shall we sell water in plastic bottles? This does no harm, but no good as well. Bottled water abroad is better than in Russia because of tough sanitary service requirements, but sometimes it costs there more than vodka.

Practically in all developed countries chlorination of drinking water is prohibited by law: dioxins, which suppress the immunity, arise when such a liquid is boiled. Water is purified by means of ozonization, ultrasound and silvering. These methods are better than chlorination, but such technologies are expensive, and, above all, ineffective. They just have gone out of date. In some cities of Europe and UAE the installations, which purify water, are placed right in the streets for public use: people can pour themselves a glass of pure cool water anytime. But Russian installations are far better than these. We are able to produce such installations; they will be both cheap and effective. We can state with all the responsibility that

obtaining of pure drinking water is not a problem of technologies. This problem can be solved within a year in Izhevsk, within two - in the region and within five years - in the whole of Russia. Goodwill of officials is necessary for that, and the investors will not take long to appear.

***- What happens to water during electrochemical activation?***

- It becomes not just pure - it becomes beneficial. When positively charged tap water (the one we have now) gets into body, it steals electrons from cells and tissues, which are 90% water. Biologic structures of an organism - cell membranes, organs etc. - are exposed to oxidizing destruction. Apparatuses wear out and age rapidly; organs lose their functions. But this process can be inhibited, if water with properties of internal environment of an organism is supplied with food and drink. We can obtain such water using the method of electrochemical activation. It gives the organism more energy that is used by cells as protection from unfavourable conditions of the outdoor environment.

**Capital as innovations' enemy**

***- At the joint sitting of the Association "Bolshoi Ural", Russian Academy of Science and the staff of Security Counsel of Russian Federation in Izhevsk in February it was stressed that Russia is driving to the periphery of the world scientific and technical research. And Professor Doug Wynyard from Las Vegas admitted at the first International Congress, dedicated to water purification (Moscow, 1997): "We came to Russia to study hard, hoping to get at least in the last coach of the Russian train of modern technologies." So who was on time, and who was not?***

- So far the whole world is late. But Russia has a chance to pull ahead, because modern innovation technologies on the basis of resonance appeared here.

We all have become observers and partakers of the profoundest crisis of science and technology. Instead of higher work productivity and rise in living standards scientific and technical progress resulted in the worsening of either aspects. We can observe the same situation abroad, but it is less explicit there. The present crisis is caused by the agony of outdated power-consuming technologies, which really improved life quality of humanity at the very beginning, when their development was limited. But when it came to mass production, these technologies led to a deadlock. Serious consequences of the outdated technologies, trying to crush the beginnings of the new ones can be observed today in ecology. Air pollution has led to acid rains, which ruin soil and water, and it brings to our consumption of unsound food. Degeneration will be the final result of it. It is a slow process, one cannot feel its effect at once, but it is inevitable. I am sure that resonance technologies will make their way through; they are already doing it. But at present there is no mass production based on them neither in Russia nor in any other country in the world. Yet Russia can become now the leader in this sphere at the world market.

***- What hampers the process then?***

- Barriers of both objective and subjective type. These are outdated technologies and a huge mass of people (officials and businessmen), who support them because of enormous takings they get. These people, taking part in the development and selling of raw materials and materials like oil, wood and metal, will not allow depriving them of such a source of income.

Or just take pharmaceutical business, which grows by leaps and bounds. The Russian Ministry of Public Health has of late issued a resolution, by which no more than five medicines should be used within a single course of treatment. Everyone understands that chemicals are poisonous. And there is a technology (based on the principle of non-contact activation of liquids), with the help of which application of medicines can be reduced by a hundred, if not a thousand times. Such a technology will enable us with an

opportunity to detect counterfeit medicines promptly, cheaply and precisely. But, unfortunately, neither pharmaceutical enterprises, nor chemist's shops or hospitals -all who profit by production and selling of medicines - are interested in it.

As far back as the end of XIX c. fuel technologies vastly more effective than petrol were known. I mean hydrogen power engineering. The technologies to substitute petrol could have been developed, but the whole branches of oil industry would have fallen flat together with their profits. Who would allow that after all?

**- Some specialists say that technologies of hydrogen power engineering are dangerous, and that is why their future is quite uncertain.**

- But resonance technologies do not mean carrying in your car something like the H-bomb, which is really dangerous. And we discuss them right now. With the help of non-contact activation of liquids, in this case water, we can obtain enough hydrogen and oxygen of suitable quality both to make the car move and to avoid any risks. An interesting analogy can be drawn. Today water in swimming-pools is treated with chlorine, which is kept in special containers. If the Moscow water park were on fire and containers with chlorine there exploded, an ecological catastrophe would be inevitable. And we have a technology (and the equipment on its basis) for disinfection of liquids, which makes possible to avoid keeping such "bombs".

Resonance technologies will certainly make their way through. It is an objective process. But at present wars are launched to bar them from developing. Why has President Bush started a war in Iraq? He has done it because of the problems with Iraqi oil, which the United States became short of. The war brought no victory, so there was a return to the idea of hydrogen power engineering. President Bush supported the program of its development and granted about \$3 billion for these researches.



### **Brakes on progress**

**- What, in your opinion, represses science intensive business in Russia?**

- First, the state has not yet tightened supervision over the development of raw materials, as it is practiced in other countries.

Second, the state policy towards innovations is rather indistinct. On the one hand, a demand for innovations is declared, on the other - there is no precise development program for them. Radical reorganization of industries and their branches is required to meet the demands of science, and not vice versa.

Third, it is widely known that Russia is rich in raw material resources. Western countries gain more from Russia's mining operations with steady production rates, not from its development of science intensive technologies seeking to save natural resources and use them effectively.

Next, it is much easier for the Russian officials to make money from the usage of outdated technologies, as in this case they only have to follow the market quotations. As resonance technologies require low power inputs, the production on their basis can be sold at a low cost price. The cost price of a liter of pure drinking water, and not just pure, but ionized (beneficial for health) is only 5-10 kopecks. Officials will not be able to make a profit out of such cheap technologies.

And the last, to apply new ideas in economics and science people should be ready morally. Have you noticed that these are not the most economically developed countries that take the lead nowadays, but these with the

priorities of development, clearly formulated by their leaders? The graphic example is UAE. They do not enlarge on it, but this country draws up new ideas and technologies more than any other at present. A bit more than 30 years ago UAE were just a desert with Bedouins and camels. But then sheikhs determined guidelines for innovation development and adoption of new technologies. Today the state budget of UAE is only 10-15% petroleum currency; the rest is brought by science-intensive technologies. They make investments reasonably and with understanding that they will run out of oil sooner or later. And what do we have in Russia? Within 15 years of economic reforms the number of scientists reduced almost by a half. Some became businessmen, others immigrated and the potential of the rest is realized quite unsatisfactorily. Out of 100% scientific developments only about 5% get to the mass production in Russia. Just to compare: the same indicator equals 70% in the United States, which adds more than \$50 billion to the state budget.

### **Business for the far-sighted**

*- As I can see, your developments can be applied in any branch of industry, cannot they?*

- Absolutely. For instance, it is widely known and acknowledged by medics, that major causes for contingencies in the world aviation are provided by the mistakes made by pilots and navigators at the time of take-offs and landings. We have found out that complete deionization of the air in the cockpit almost always take place at that time, which make brain cells lose oxygen. This results in poor reaction and sudden fatigue. We can solve this problem.

In the oil industry productive capacity of the well decreases due to low quality of water which is injected into oil pool. In this case oil industry workers have either to shut the well in without exhausting it, or to apply costly technologies, which tell on oil cost price. We have technologies to solve this problem as well as sulphur content reducing technologies for the oil of Ural.

*- Have you ever made an attempt to organize serial production of the equipment, developed in the "IKAR"?*

- JSC "Axion-holding" (Izhevsk) was interested enough in introducing devices on activation of liquids to a serial production, but did not have enough money. We have started cooperating with JSC "Cupol" (Izhevsk), but recently a manufacturing license for the device "Izumrud - SI" has been withdrawn from them. They acted in the same way as the majority of factories in Russia (some companies abroad do not shun it as well, though): why should they pay the inventors, when they can just.. .borrow the invention? We have only to throw a small party of such devices on the market for they just crib them and start producing serially; while both the technologies and equipment will be discredited for the installations will work improperly. Something like that has already happened in many regions of Russia and brought catastrophic damages, generally, because of discredit of technologies. We understand that the prestige of resonance technologies and the brand of the "IKAR" is a capital as well, that should be disposed of reasonably. That is why we assemble our devices ourselves: we order filters to one enterprise and boards to the other.

In order to avoid such discredit it is necessary, first, to provide for production of up to 10 thousand devices a month. Second, to bring to customers' notice, that devices are manufactured on the basis of Russian resonance technologies and in Russia. Prestige of such technologies, including the "IKAR" ones, is high on the world market, which is also important for a newly established business.

*- Do foreign companies make requests to purchase technologies or start the mass production?*



- Today 50-80% foreign companies are involved in innovative activity. Investments in, for example, real estate or construction do not bring much. Businessmen of such countries as the United States, Japan, Switzerland, UAE, South Korea, China, well-known companies as "Samsung" understand that capital movement should be directed at science and science intensive technologies. It is true that it is so far involves some risk. But properly developed business strategy will help to reduce, or even avoid risks, getting the profit of 1000%.

To speak about resonance technologies, I can name only one direction. The threat of bioterrorism is quite real and they are aware of it in the West. Devices on activation of liquid and air can be used to prevent such epidemics as atypical pneumonia, bird influenza and "mad cow" disease. There is an increasing demand for these devices on the world market. In 55 countries of the world there is a steady demand for them: in the United States, Japan, and UAE etc. And the whole world is interested in this technology.

Lately a big businessman from Ireland got in touch with me. He looked for the breakthrough technologies in Russia and all over the world to make investments in them. At present such business proposals become more frequent than a couple of years ago. We receive letters, calls and guests from the whole business world.

It is a pleasure doing business with China. They have felt the difference between the devices, manufactured on the basis of Russian resonance technologies and all the rest. They told us that they did not need an international patent, and agreed to have devices manufactured in Russia under our brand.

Terms of transaction, proposed by the USA firms do not suit us. Technologies, which are analogous to none in the world cost a lot more than the American businessmen may imagine. When they come up to understand, that Russian inventors deserve being as well paid as any other inventors, we will agree to work together. We have invented cheap technologies and devices, but it does not mean that we will give them for nothing.

South Korean company "Samsung" tries to copy Russian water purifying installations. They purchase them in Russia, make copies and sell them to different countries. But according to our observations, these installations do not work properly, as all the technologies remained in Russia. But it is nice that our installations are copied and reproduced abroad. It looks like there is a demand in the world not only for the "Adidas", but also for the "IKAR" brand.

***- Do not you, as a man of science, feel hurt to lose time doing applied research and business?***

- I am depressed with a fact, that I have only 15 minutes a day left for the research on problems of fundamental physics. And the greatest pity is that I am 50 already, and my 15 minutes are not enough to unravel a mystery of stability of stars. Though, I have published a theoretical research about it. But first, means are required to pursue science; second, we must not allow the Russian technologies to be discredited and foremost - in the country they appeared.