
Genrich Altshuller: Father of TRIZ

by Leonid Lerner

The person we are going to discuss is unique.

He is unique not just because he developed an amazing science.

He is unique because he never asked for anything in return.

He never said, "Give me."

He always said, "Take this."

His name is Genrich Altshuller.

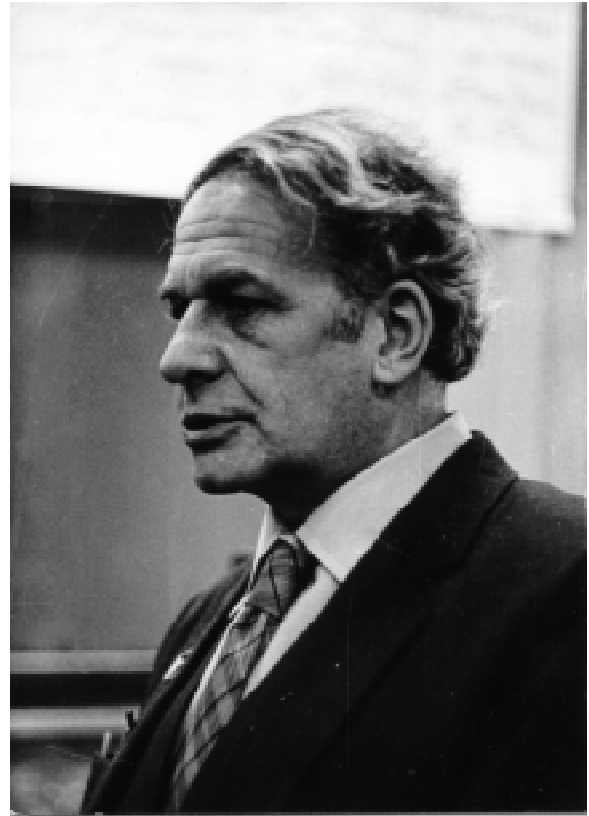
LETTER TO STALIN

In December of 1948, while a Lieutenant of the Caspian Sea Military Navy, Genrich Altshuller wrote a dangerous letter addressed: "Personally to Comrade Stalin." The author pointed out to his country's leader that there was chaos and ignorance in the USSR's approach to innovation and inventing. At the end of the letter he expressed an even more "outrageous" thought: There exists a theory that can help any engineer invent. This theory could produce invaluable results and revolutionize the technical world. The harsh answer to this letter did not arrive until two years later. Meanwhile, let's introduce this brash young Lieutenant.

Genrich Altshuller was born on October 15, 1926 in Tashkent in the former USSR. He spent many years in Baku, the Capital of Azerbaidzhan. Since 1990 he has resided in Petrozavodsk, Karelia.

Altshuller received his first Author's Certificate [internal Russian patent] for an underwater diving apparatus while a student in the ninth grade. In the tenth grade he built a boat having a rocket engine that used carbide for fuel. In 1946 he developed his first mature invention, a method for escaping from an immobilized submarine without diving gear. This invention was immediately classified as a military secret — and Altshuller was offered employment in the patent department of the Caspian Sea Military Navy.

The head of that patent department was a man who indulged in fantasies. He asked Altshuller to find a solution to one fantasy: find a military diversion to help a soldier trapped behind enemy lines with no resources. In response, Altshuller invented a new



kind of weapon — an extremely noxious chemical substance made from common medical drugs. This invention was a success, and the inventor was brought to meet Mr. Beria, the head of the KGB in Moscow. Four years later, while in one of Beria's prisons, Altshuller would be charged with disrupting a parade in Red Square with this same invention.

Altshuller was a successful young inventor. What triggered his desire to write a letter to Stalin that would destroy his carrier and change his life forever?

"The point is," Altshuller says, "not only did I have to invent, I had to help those who wanted to invent as well."

Dozens of people came to his office. "Here is a problem," they said. "I cannot solve it. What can I do?" In response, Altshuller searched all the scientific libraries but did not find even the most elementary text book on the subject of inventing. Scientists claimed that inventions were the result of accidents, mood, or "blood type." Altshuller could not accept

this — if a methodology for inventing did not exist, one should be developed.

Altshuller shared his ideas with his former schoolmate Rafael Shapiro, an inventor driven to achieve maximum success. By this time, Altshuller had already learned that invention is nothing more than the removal of a technical contradiction with the help of certain principles. Invention is certain if an inventor possesses knowledge of these principles. Shapiro was excited about this discovery and suggested that they should immediately write a letter to Stalin to get his support.

Altshuller and Shapiro prepared themselves. They searched for new methods, studied all the existing patents and took part in inventing competitions. They even received a National Competition Award for inventing a flame and heat resistant suit. Suddenly, they were asked to come to Tbilisi, a town in Georgia. They were arrested as they arrived and, two days later, their interrogation began. They were charged with “inventor’s” sabotage and, as was usual in those days, sentenced to 25 years imprisonment.

This happened in 1950. The reader may think this is the beginning of a story about “a martyr for his ideas.” However, Altshuller views his arrest differently.

“Before prison, I struggled with simple human doubts. If my ideas were so important, why weren’t they recognized? All my doubts were resolved by the MGB [Moscow Committee of State Security].” After his arrest a series of situations occurred where, in order to stay alive, Altshuller utilized TRIZ (The Theory of Solving Inventive Problems) concepts as his only means of defense.

In a Moscow prison, Altshuller refused to sign a confession and was placed on an “interrogation conveyor.” All night he was questioned. During the day, he was not allowed to sleep. Altshuller understood that he could not survive under these conditions. He stated the problem: How can I sleep and not sleep at the same time? The task seemed unsolvable. The most rest he was permitted was to sit with his eyes open. This meant that, in order to sleep, his eyes must be open and closed at the same time. This was easy. Two pieces of paper were torn from a cigarette package. With a charred match, he drew a pupil on each piece of paper. Altshuller’s roommate spit on the papers

and stuck them to Altshuller’s closed eyes. After that he sat across from the door’s peek hole and calmly fell asleep. He was thus able to sleep for several days in a row. His interrogator wondered why Altshuller seemed fresh every night.

Finally, Altshuller was sentenced to Siberia’s Gulag where he worked 12 hours every day logging. Knowing that he could not survive working so hard, he asked himself the question: “Which is better — continue to work, or refuse and be put into solitary confinement?” He chose confinement and was transferred to a section with criminals. Here survival was much simpler. He befriended the prisoners by telling them many fictional stories he knew by heart.

Later, Altshuller was transferred to a camp where the older intelligentsia — scientists, lawyers, architects — were slowly dying. To cheer up these desperate people, Altshuller opened his “One Student University.” Each day, for 12 to 14 hours, he attended classes and seminars that the revived professors gave him. This is how Altshuller received his “college education.”

In the Varkuta coal mines — another gulag camp — he spent 8 to 10 hours a day developing his TRIZ theory while constantly resolving emergency technical situations in the mines. Nobody believed that this young inventor was working in the mines for the first time. Everybody thought he was tricking them. The chief engineer did not want to hear that TRIZ methods were helping.

One night, Altshuller heard that Stalin had died. A year and a half later, Altshuller was released. Upon his return to Baku he learned that his mother, having lost all hope of ever seeing her son, committed suicide.

In 1956, the first paper written by Altshuller and Shapiro, “Psychology of Inventive Creativity,” was published in the journal *Voprosi of Psihologi* [Problems of Psychology]. For scientists who study the creative process it was as if a bomb had exploded. Until that time, Soviet and foreign psychologists believed it a fact that inventions were born through accidental enlightenment — the sudden spark of an idea.

After analyzing a fund of worldwide patents, Altshuller offered a different method based on the results of human inventive activity. Invention de-

rives from a problem analysis revealing a contradiction.

After studying 200,000 patents, Altshuller concluded that there are about 1,500 technical contradictions that can be resolved relatively easily by applying fundamental principles.

“You can wait a hundred years for enlightenment, or you can solve the problem in 15 minutes with these principles,” he said.

What would Altshuller’s opponents say if they knew that the obscure “H. Altov” [Altshuller’s pen name] was making a living writing science fiction stories utilizing TRIZ concepts? Altov wrote his fictions utilizing his inventive ideas. In 1961 Altshuller wrote his first book *How to Learn to Invent*. In this small book he laughs at the popular opinion that one must be born an inventor. He criticizes the trial and error method used to make discoveries. Fifty thousand readers, each paying only 25 kopecks [25 cents], learned the first 20 inventive methods of TRIZ.

In 1959, trying to get acceptance of his theory, Altshuller wrote a letter to the highest patent organization in the former Soviet Union — VOIR [All Union Society of Inventors and Innovators]. He asked for a chance to prove his theory. Nine years later, after writing hundreds of letters, he finally got his answer. His requested seminar on inventive methodology would be held in Dsintary, Georgia, not later than December of 1968.

It was the first ever seminar on TRIZ. There for

the first time he met people who had considered themselves his students. Alexander Selioutski from Petrosavodsk, Voluslav Mitrofanov from Leningrad, Isaak Buchman from Riga, and others. These young engineers — and later many others — would open TRIZ schools in their cities. Hundreds of people that went through Altshuller’s schools asked him to come and conduct seminars in different towns of the Soviet Union.

In 1969 Altshuller published a new book: *Algorithm of Inventing*. In this book he gave his readers and students 40 Principles, and the first algorithm to solve complex inventive problems.

Voluslav Mitrofanov, the founder of Leningrad University of Technical Creativity, told a story about Robert Anglin, a prominent inventor from Leningrad. Once, Anglin — who has over 40 inventions developed through the agony of trial and error creativity — came to a TRIZ seminar. He was very quiet during the TRIZ training session. After everyone had left, he was still sitting at the table, covering his head with his hands. “How much time was wasted!” he was saying. “How much time ... If I only knew TRIZ earlier!”

The Russian TRIZ Association was established in 1989 with Altshuller as President.

This is an excerpt from an article written by Leonid Lerner and published in the Russian Magazine Ogonek in 1991.