

Example 13.38. "The Lord of the Rings and the Strings"

Creative personalities succeed not owing to, but in spite of, society. In spite of society of today. For the sake of society of tomorrow.²¹⁶

G.S. Altshuller

Out of a hundred geniuses ninety-nine die unrecognized and the hundredth is faced with huge difficulties in making a break-through.²¹⁷

Rudolph Diesel

1. The Becoming of the "Lord of the Rings"

Mankind can be proud of the rockets it has created over the course of its history – from the Chinese arrow rockets to giant modern booster rockets launching interplanetary spaceships and carrying cargoes into the near-earth space. In this book, we have spoken at length about outstanding inventions improving rocket technologies.

However, at the dawn of the space era, amid triumphant reports of Soviet and American rocket launches, a high school student from Belarus challenged the expediency and the "eternal glorious future" of rockets as the main instrument of mastering the near-earth space! Incredible but true!

It was the year of 1955. A six-year-old boy who knew nothing of Konstantin Tsiolkovsky, let alone Wernher von Braun or Sergey Korolyov, started to build "rockets" before the world had even heard of Yuri Gagarin, the first man to fly into space. For "fuel" he used pieces of plastic combs burning as bright as gunpowder, or scraps of film left over by the projectionist operating the "cinemobile" that came each week to show movies at the village community center. But best of all the boy liked the long macaroni-like tubes of German smokeless gunpowder that came from a huge arsenal destroyed by guerillas at the railroad station of Posudovo, some 8 kilometers from the boy's native village of Kryuki lost among the endless bogs of Belarus Polesye (Woodland). It was dangerous – the site of the arsenal was pockmarked with crosses topping the graves of other curious children who had blown themselves up trying to disassemble mines or shells they had found lying around.

In 1962, soon after the historical first manned spaceflights, the boy's family moved to Dzhezkazgan, Kazakhstan, to work on virgin lands. The fact that his new home was close to the Baikonur Cosmodrome only increased the boy's interest in rockets. He had to make his rocket and rocket engine models from paper and

²¹⁶ From: G.S. Altshuller, I.M. Vertkin (1994) *How to Become a Genius. Life Strategy of a Creative Personality*. – Minsk, Belarus

²¹⁷ Rudolph Diesel (1858-1913) – great German engineer, inventor of the "Diesel" engine; died during the Antwerp to London voyage on *Dresden* ferry. Quoted from *The 7 Golden Rules of Creativity. Imagination at the Heart of Business* by Gottlieb Guntern, *Business Digest*, 112, October 2001; a more extensive quote is given in *Genetics of the Genius* by V.P. Efromson (1908-1989) – a famous Soviet geneticist

glue – the only materials available to schoolchildren in those times. He also managed to manufacture smoke powder from components sold in ordinary drugstores.

When he was in the 8th grade at school, his three-stage rockets could go up several kilometers. He also had his "astronauts" – gray mice which came down to earth on paper parachutes. By the time he finished school, he had acquired superior knowledge of physics and mathematics, taken part in numerous physical and mathematical contests for schoolchildren, examined the works of Konstantin Eduardovich Tsiolkovsky, and undertaken his own analysis of the rocket method of space exploration. Being a huge sci-fi fan, he had no doubt that the future of mankind was there, up among the stars...

But he was bitterly disappointed. It turned out that, if you factored in the energy expended on manufacturing fuel components and the cost of jettisoned disposable elements of construction, the energy efficiency ratio of the booster rocket was way below one percent. For comparison, the energy efficiency ratio of a modern steam engine is 15%. Technical achievements of space science – excessive power of the booster rocket engines (about 100 million HP), high reactive jet velocity (many times faster than the fastest bullet) and high temperature of combustion products (higher than the temperature inside a Martin furnace) – not only failed to inspire the young man, but chagrined him.

He found out that the aggregate weight of payload launched into near-earth orbits (about 300 km) by the mankind over the course of many years amounted only to several hundred tons. The same amount of cargo could be transported on the Earth over the same period of time and by the same distance of 300 km... by just one horse pulling just one cart! In other words, all achievements of modern space exploration were backed up by one exorbitantly priced golden, no, diamond "space cart" and one diamond "space horse" with an efficiency ratio lower than that of a steam engine by an order of magnitude.

Thus the boy destroyed his own youthful dreams about the bright future of mankind – about space cities, orbital plants and power stations. It was simply impossible to build and maintain them using just one "space cart".

The boy became a student of the Tyumen Engineering and Construction Institute where he majored in *Road Engineering (Automobile Roads and Constructions)* and acquired in-depth knowledge of resistance of materials, structural mechanics, physics and higher mathematics. He continued his studies, and soon realized that the most environmentally friendly way to launch things into space from the surface of the planet was for the propulsion unit to use ... the internal forces of the space transportation system!

Ideal functional model! An unexpected application of the Baron Münchhausen principle! It is rumored that the inventive baron pulled himself and his horse out of the bog by his own hair made into a pigtail. This principle is very efficient in that the "Münchhausen-Horse" transportation system rose up without bearing on, or interacting with, its immediate environment, i.e. had absolutely no negative effect on that environment.

Unfortunately, inasmuch as Münchhausen did not attend modern school, he did not know that he had breached one of the conservation laws stating that it is im-

possible to move the mass center of a system in space using internal forces of such system.

So, we have an *irreconcilable radical contradiction*: in order to make a launch, we need a "point of support" on the Earth – the rocket is "supported" first by the launch pad and then by the gas jet issuing from the engine – and we need the mass center of the object being transported to be moved into the near-earth space; on the other hand, to exclude interaction with the environment, the "point of support" must not be situated on the Earth, and the mass center must not be moved into space!

Apparently, the problem has no solution.

But the student did find a solution – and a very simple one: the spacecraft must be made in the form of an elastic ring encompassing the Earth, and then that ring must be spun at a speed exceeding circular velocity! Then the ring will overcome gravitation, and begin to rise and stretch under the influence of centrifugal forces!

By the time the ring reaches an altitude of 300 km, its diameter will have increased only by 600 km, or approximately by 5%. The mass center of the system will coincide with the mass center of the planet – i.e. it will remain on, or rather in, the Earth! And the "point of support" is simply not there! There is only the ring spin trajectory, but it does not need to interact with the Earth to pull of the launch trick!

The miracle accomplished by this unique unprecedented idea is more impressive than all the magic worked by all the wizards in *The Lord of the Rings*²¹⁸! It is the miracle of a self-organizing system which is based on the laws and forces of Nature – and which remains in harmony with Nature! The real "Lord of the Rings" is the 19-year-old inventor Anatoly Unitsky.

The more so because student Unitsky invented not only the method to launch just one ring, but the concept of intermittently launching and landing multiple rings which are realigned in flight so as to occupy different orbits in space.

2. *The Rise of the "Lord of the Strings"*

In the early 1970-es, Unitsky returned to his native Belarus, and in 1973 he graduated from the Belarus Polytechnic Institute (University) in Minsk. He continued to fine-tune the engineering and design aspects of the Planetary Transportation Vehicle (PTV) concept. In 1986 he became a member of the Cosmonautical Federation of the USSR, and in 1988 hosted the First International Research Conference *Rocket-Free Industrialization of Space: Problems, Ideas, Projects!*

Working on his project, Unitsky had to deal not only with numerous fierce critics, but also with direct resistance from the KGB both in Moscow and in Minsk. Having detected a "round peg", the "square-hole" society unleashed a war on a person who freely shared his talent and his inventions.

The main argument of Unitsky's critics was that construction around the Earth of a trestle which was to serve as the PTV "launching pad" would require too

²¹⁸ *The Lord of the Rings* is the title of the well-known and repeatedly cinematized fantasy novel by the English writer John Ronald Reuel Tolkien (1892-1973), published in London in 1954-1955

much construction materials. He proceeded to improve the trestle design. The streamlined construction would take about as much concrete as had been used to build the Sayano-Shushenskaya Dam on the Yenisei River, and as much metal as had been used to build every hundredth motorcar on the planet!

And then Unitsky made his second invention/discovery which was equally unique and unprecedented: the trans-planetary ring needed an exceptionally smooth and straight track – and only the **STRING** could be used as the prototype for such structure!

Only a self-organizing system!

String constructions are universal and widely used by the Creator. For example, tubular bones in our skeleton are so durable because they are made based on the same templates as strings: some of their fibers are stretched, while others are compressed. It is not inconceivable that all material world and our entire Universe are made of miniscule quantum strings.

In 1995 Unitsky published a limited edition of his first scientific monograph *String Transportation Systems: On the Earth and in Space*. While PTV continues to evolve as the main avenue of future industrialization of space, development of string bearing structures has resulted in the invention of string bridges and trestles, string runways, string high-rise and seismically-resistant buildings, string vacuum glass, and many other string technologies.

Let us draw conclusions (www.stringtransport.com, www.st21.ru).

PTV can lift into space, in one go, millions of tons of cargo and, if necessary, millions of passengers.

Technically speaking, PTV is a torus with a diameter of about 10 m. Inside the torus, there runs an annular vacuum channel housing an endless (annular) rotor suspended inside magnetic field and not touching the walls. When a linear actuator accelerates the annular rotor running inside the vacuum channel (i.e. around the Earth) to circular velocity, the rotor will become weightless. Additional acceleration will create excessive centrifugal force which will be trying to increase the diameter of the ring. If that force exceeds the weight of the construction, each point of the rotor will commence vertical ascent, and some two or three hours later the ring, noiselessly increasing its diameter and, accordingly, stretching out, will occupy a circular orbit at the altitude of, say, 300 km. Incidentally, the ring will lift the payload without ever touching it: the payload will be evenly distributed along the length of the ring and attached to it by magnetic fields. When the speed of rotation of the ring in orbit is decreased, the ring will gradually descend and "land" to the launching trestle on the Earth.

String technologies can make a breakthrough in road and bridge construction technologies, and in many other areas. For example, why not build a string bridge across the Bering Strait to connect the African, Eurasian and Pan-American continents into a transportation mega-system (preferably, of the string variety)?!

Let us wish the "Lord of the Rings and the Strings" – the man whose ideas have come [?] years before their time – speedy realization of his dreams and implementation of his projects!

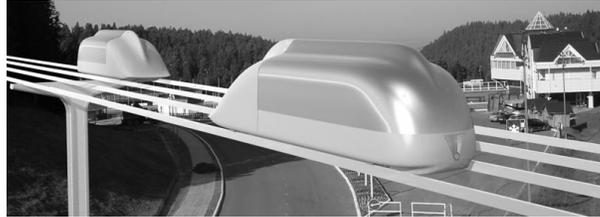


fig. 13.72. Medium-sized high-speed passenger modules

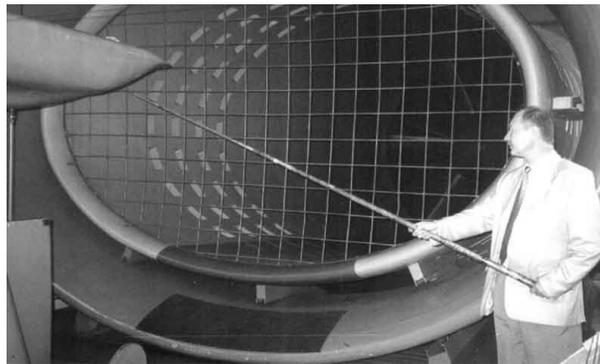


fig. 13.73. A.E. Unitsky preparing a transportation module for the wind-tunnel test (Saint-Petersburg, 2001)

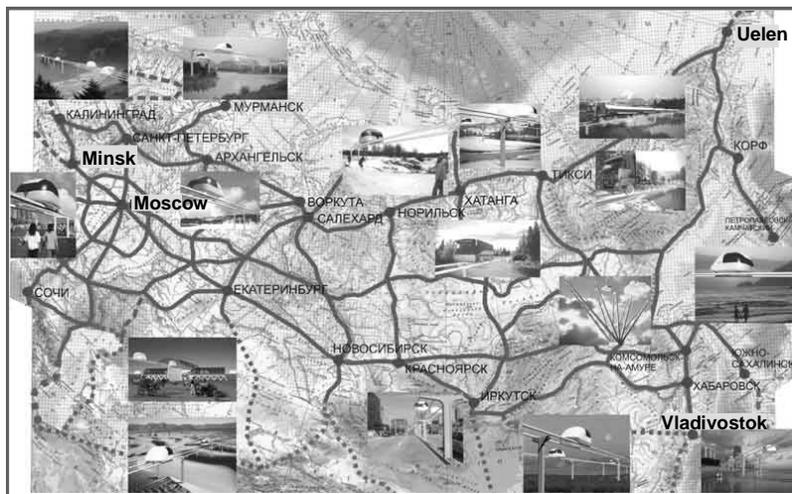


fig. 13.74. Trans-Russian String Transportation System exiting onto the Bering Strait (2003 project)