

# HISTORICAL NOTE

by Murray Leinster

PROFESSOR VLADIMIR ROJESTVENSKY, IT HAS SINCE BEEN LEARNED, remade the world at breakfast one morning while eating a bowl of rather watery red-cabbage soup, with black bread on the side. It is now a matter of history that the soup was not up to par that day, and the black bread in Omsk all that week was sub-marginal. But neither of these factors is considered to have contributed to the remaking of civilization.

The essential thing was that, while blowing on a spoonful of red-cabbage soup, Professor Rojestvensky happened to think of an inter-esting inference or deduction to be drawn from the Bramwell-Weems Equation expressing the distribution of energy among the nucleus-parti-cles of the lighter atoms. The Bramwell-Weems Equation was known in Russia as the Gabrilovitch-Brekhov Formula because, obviously, Rus-sians must have thought of it first. The symbols, however, were the same as in the capitalist world.

Professor Rojestvensky contemplated the inference with pleasure. It was very interesting indeed. He finished his breakfast, drank a glass of hot tea, wrapped himself up warmly, and set out for his classrooms in the University of Omsk. It was a long walk, because the streetcars were not running. It was a fruitful one, though. For as he walked, Professor Rojestvensky arranged his reasoning in excellent order. When he ar-rived at the University he found a directive from the Council of Soviet Representatives for Science and Culture. It notified him that from now on Soviet scientists must produce more and better and more Earth-shaking discoveries—or else. Therefore he would immediately report, in quad-ruplicate, what first-rank discoveries he was prepared to make in the sci-ence of physics. And they had better be good.

He was a modest man, was Professor Rojestvensky, but to fail to obey the directive meant losing his job. So he quakingly prepared a paper outlining his extension of the Bramwell-Weems Equation—but he was careful to call it the Gabrilovitch-Brekhov Formula—and persuaded one of his students to make four copies of it in exchange for a quarter of a pound of cheese. Then he sent off the four copies and slept badly for weeks afterward. He knew his work was good, but he didn't know whether it was good enough. It merely accounted for the mutual repul-sion of the molecules of gases, it neatly explained the formation of comets' tails, and it could have led to the prediction of clouds of calcium vapor—already observed—in interstellar space. Professor Rojestvensky did not guess he had remade the world.

Weeks passed, and nothing happened. That was a bad month in Rus-sian science. The staffs of Medical Research and Surgical Advancement had already reported everything they could dream up. Workers in Aero-dynamic Design weren't sticking out their necks. The last man to design a new plane went to prison for eight years when a fuel line clogged on his plane's test flight. And Nuclear Fission workers stuck to their policy of demanding unobtainable equipment and supplies for the furtherance of their work. So Professor Rojestvensky's paper was absolutely the only contribution paddable to Earth-shaking size. His paper itself was pub-lished in the *Soviet Journal of Advanced Science*. Then it was quoted unintelligibly in *Pravda* and Tass, with ecstatic editorials pointing out how far Russian science was ahead of mere capitalist-imperialistic re-search. And that was that.

Possibly that would have been the end of it all, but that some two weeks later an American jet bomber flew twelve thousand miles, dropped fifteen tons of simulated bombs—actually condensed milk lowered to Earth by parachutes—and returned to base without refueling. This, of course, could not be allowed to go unchallenged. So a stern directive went to Aerodynamic Design. An outstanding achievement in aviation must be produced immediately. It must wipe the Americans' decadent, capitalistic eyes. Or—so the directive said explicitly—else.

The brain trust which was Aerodynamic Design went into sweating executive session, seeking a really air-tight procedure for passing the buck. They didn't want to lose their jobs, which were fairly fat ones, any more than Professor Rojestvensky had. They had to cook up something in a hurry, something really

dramatic, with an out putting the blame squarely on somebody else if it didn't work. They couldn't blame Aviation Production, though. The head of that splendid organization had an in with the Politbureau. Something new and drastic and good was needed.

In the end a desperate junior official began to hunt through recent Soviet contributions to science. If he could find something impressive that could be twisted into an advance in aerodynamics, it could be designed and built, and any failure blamed on the scientist who had furnished false data as a form of alien-inspired sabotage. Scientists were always expend-able in Russian politics. It was time to expend one. Largely because his name was on top of the pile, Professor Rojestvensky was picked.

This, in detail, is the process by which his extension of the Bramwell-Weems—or Gabrilovitch-Brekhov—Equation was selected for practical development. Our brave new world is the result. Aerodynamic Design borrowed a man from Nuclear Fission in a deal between two department heads, and the Nuclear Fission man agreed to work up something elaborate and impressive. He set to work on Professor Rojestvensky's figures. And presently he turned pale, and gulped very rapidly several times, and muttered, "*Gospody pomilov!*" That meant, "Lord have mercy on us!" and it was not a good Russian expression any longer, but it was the way he felt. In time, he showed his results to Aerodynamic Design and said, in effect, "But, it might really work!"

Aerodynamic Design sent him out to Omsk to get Professor Rojestvensky to check his calculations. It was a shrewd move. The Nuclear Fission man and Professor Rojestvensky got along splendidly. They ate red-cabbage soup together and the professor O.K.'d the whole project. That made him responsible for anything that went wrong and Aero-dynamic Design, en masse, was much relieved. They sent in a preliminary report on their intentions and started to make one gadget themselves. The Nuclear Fission man was strangely willing to play along and see what happened. He supervised the construction of the thing.

It consisted of a set of straps very much like a parachute harness, hung from a little bar of brass with a plating of metallic sodium, under another plating of nickel, and the whole thing inclosed in a plastic tube. There was a small box with a couple of controls. That was all there was to it.

When it was finished, the Nuclear-Fission man tried it out himself. He climbed into the harness in the Wind Tunnel Building of Aero-dynamic Design's plant, said the Russian equivalent of "Here goes nothing!" and flipped over one of the controls. In his shakiness, he pushed it too far. He left the ground, went straight up like a rocket, and cracked his head against the three-story-high ceiling and was knocked cold for two hours. They had to haul him down from the ceiling with an extension ladder, because the gadget he'd made tried insistently to push a hole through the roof to the wide blue yonder.

When he recovered consciousness, practically all of Aerodynamic Design surrounded him, wearing startled expressions. And they stayed around while he found out what the new device would do. Put briefly, it would do practically anything but make fondant. It was a personal flying device, not an airplane, which would lift up to two hundred twenty-five pounds. It would hover perfectly. It would, all by itself, travel in any direction at any speed a man could stand without a windshield.

True, the Rojestvensky Effect which made it fly was limited. No matter how big you made the metal bar, it wouldn't lift more than roughly a hundred kilos, nearly two-hundred-and-fifty pounds. But it worked by the fact that the layer of metallic sodium on the brass pushed violently away from all other sodium more than three meters away from it. Sodium within three meters wasn't affected. And there was sodium everywhere. Sodium chloride—common table salt—is present everywhere on Earth and the waters under the Earth, but it isn't present in the heavens above. So the thing would fly anywhere over land or sea, but it wouldn't go but so high. The top limit for the gadget's flight was about four thousand feet, with a hundred-and-fifty-pound man in the harness. A heavier man couldn't get up so high. And it was infinitely safe. A man could fly night, day, or blind drunk and nothing could happen to him. He couldn't run into a mountain because he'd bounce over it. The thing was marvelous!

Aerodynamic Design made a second triumphant report to the Politbureau. A new and appropriately revolutionary device—it was Russian—had been produced in obedience to orders. Russian science had

come through! When better revolutionary discoveries were made, Russia would make them! And if the device was inherently limited to one-man use—ha-ha! It gave the Russian army flying infantry! It provided the perfect modern technique for revolutionary war! It offered the perfect defense for peaceful, democratic Russia against malevolent capitalistic imperialism! In short, it was hot stuff!

As a matter of fact, it was. Two months later there was a May Day celebration in Moscow at which the proof of Russia's superlative science was unveiled to the world. Planes flew over Red Square in magnificent massed formations. Tanks and guns rumbled through the streets leading to Lenin's tomb. But the infantry—where was the infantry? Where were the serried ranks of armed men, shaking the earth with their steady tread? Behind the tanks and guns there was only emptiness.

For a while only. There was silence after the guns had gone clanking by. Then a far-distant, tumultuous uproar of cheering. Something new, something strange and marvelous had roused the remotest quarter of the city to enthusiasm. Far, far away, the flying infantry appeared!

Some of the more naïve of the populace believed at first that the U.S.S.R. had made a nonaggression pact with God and that a detachment of angels was parading in compliment to the Soviet Union. It wasn't too implausible, as a first impression. Shoulder to shoulder, rank after rank, holding fast to lines like dog leashes that held them in formation, no less than twelve thousand Russian infantrymen floated into the Red Square some fifteen feet off the ground. They were a bit ragged as to elevation, and they tended to eddy a bit at street corners, but they swept out of the canyons which were streets at a magnificent twenty-five miles an hour, in such a display of air-borne strength as the world had never seen before.

The population cheered itself hoarse. The foreign attaches looked inscrutable. The members of the Politbureau looked on and happily began to form in their minds the demands they would make for pacts of peace and friendship—and military bases—with formerly recalcitrant European nations. These pacts of closest friendship were going to be honeys!

That same morning Professor Rojestvensky breakfasted on red-cabbage soup and black bread, wholly unaware that he had remade the world. But that great event was in the making was self-evident even to members of the United States Senate. Newsreel pictures of the flying infantry parade were shown everywhere. And the Communist parties of the Western nations were, of course, wholly independent organizations with no connection whatever with Moscow. But they could not restrain their enthusiasm over this evidence of Russian greatness. Cheering sections of Communists attended every showing of the newsreels in every theater and howled themselves hoarse. They took regular turns at it and were supplied with throat lozenges by ardent Party workers. Later newsreels showing the flying infantry returning to camp over the rooftops of Moscow evoked screams of admiration. When a Russian documentary film appeared in the Western world, skillfully faking the number of men equipped with individual flying units, the national, patriotic Communist party members began to mention brightly that everybody who did not say loudly, at regular intervals, that Russia was the greatest country in the world was having his name written down for future reference.

Inspired news-stories mentioned that the entire Russian army would be air-borne within three months. The magnificent feat of Russian industry in turning out three million flying devices per month brought forth screaming headlines in the *Daily Worker*. There were only two minor discords in the choral antiphony of national-Communist hosannas and capitalistic alarm.

One was an air-force general's meditative answer to the question: "What defense can there be against an army traveling through the air like a swarm of locusts?" The general said mildly: "Well-I-I, we carried eighteen tons of condensed milk fourteen thousand miles last week, and we've done pretty good work for the Agriculture Department dusting grasshoppers."

The other was the bitter protest made by the Russian ambassador in Washington. He denounced the capitalist-economy-inspired prevention of the shipment to Russia of an order for brass rods plated with metallic sodium, then plated with nickel, and afterward inclosed in plastic tubes. State Department investigation showed that while an initial order of twelve thousand five hundred such rods had been shipped in April, there had been a number of fires in the factory since, and it had been closed down until fire-prevention methods could be devised. It was pointed out that metallic sodium is hot stuff. It catches fire when wetted or even out of pure cussedness it is fiercely inflammable.

This was a fact that Aviation Production in Russia had already found out. The head man was in trouble with his own friends in the Politbureau for failing to meet production quotas, and he'd ordered the tricky stuff—the rods had to be dipped in melted sodium in a helium atmosphere for quantity production—manufactured in the benighted and scientifically retarded United States.

There was another item that should be mentioned, too. Within a week after the issue of personal fliers to Russian infantrymen, no less than sixty-four desertions by air to Western nations took place. On the morning after the first night maneuvers of the air-borne force, ninety-two Russians were discovered in the Allied half of Germany alone, trying to swap their gadgets for suits of civilian clothes.

They were obliged, of course. Enterprising black marketeers joyfully purchased the personal fliers, shipped them to France, to Holland, to Belgium, Sweden, Norway, and Switzerland, and sold them at enormous profits. In a week it was notorious that any Russian deserter from the flying infantry could sell his flight-equipment for enough money to buy forty-nine wrist watches and still stay drunk for six months. It was typical private enterprise. It was unprincipled and unjust. But it got worse.

Private entrepreneurs stole the invention itself. At first the units were reproduced one by one in small shops for high prices. But the fire-hazard was great. Production-line methods were really necessary both for economy and industrial safety reasons. So after a while the Bofors Company, of Sweden, rather apologetically turned out a sport model, in quantity, selling for *kronen* worth twelve dollars and fifty cents in American money. Then the refurbished I. G. Farben put out a German type which sold openly for a sum in occupation marks equal to only nine eighty American. A Belgian model priced—in francs—at five fifty had a wide sale, but was not considered quite equal to the Dutch model at guilders exchanging for six twenty-five or the French model with leather-trimmed straps at seven dollars worth of devaluated francs.

The United States capitalists started late. Two bicycle makers switched their factories to the production of personal fliers, yet by the middle of June American production was estimated at not over fifty thousand per month. But in July, one hundred eighty thousand were produced and in August the production—expected to be about three hundred thousand—suddenly went sky-high when both General Electric and Westinghouse entered the market. In September American production was over three million and it became evident that manufacturers would have to compete with each other on finish and luxury of design. The days when anything that would fly was salable at three fifty and up were over.

The personal flier became a part of American life, as, of course, it became a part of life everywhere. In the United States the inherent four-thousand-foot ceiling of personal fliers kept regular air traffic from having trouble except near airports, and flier-equipped airport police soon developed techniques for traffic control. A blimp patrol had to be set up off the Atlantic Coast to head back enthusiasts for foreign travel and Gulf Stream fishing, but it worked very well. There were three million, then five million, and by November twelve million personal-flier-equipped Americans aloft. And the total continued to rise. Suburban railways—especially after weather-proof garments became really good—joyfully abandoned their short-haul passenger traffic and all the railroads settled down contentedly to their real and profitable business of long-haul heavy-freight carriage. Even the air lines prospered incredibly. The speed-limitation on personal fliers still left the jet-driven plane the only way to travel long distances quickly, and passengers desiring intermediate stops simply stepped out of a plane door when near their desired destination. Rural residential developments sprang up like mushrooms. A marked trend toward country life multiplied, Florida and California became so crowded that everybody got disgusted and went home, and the millennium appeared to be just around the corner.

Then came the dawn. It was actually the dawn of the remade world, but it looked bad for a while. The Soviet government stormed at the conscienceless, degraded theft of its own State secret by decadent and imperialistic outsiders. Actual Russian production of personal fliers was somewhere around twenty-five hundred per month at a time when half the population of Europe and America had proved that flying was cheaper than walking. Sternly, the Soviet government—through the Cominform—suggested that now was the time for all good Communists to come to the aid of their Party. The Party needed personal fliers. Fast. So enthusiastic Communists all over Europe flew loyally to Russia to contribute to the safety of

their ideals, and to prove the international solidarity of the proletariat. They landed by tens of thousands without passports, without ration cards, and often with insufficient Party credentials. They undoubtedly had spies among them, along with noble comrades. So the U.S.S.R. had to protect itself. Regretfully, Russian officials clapped the new arrivals into jail as they landed, took away their fliers, and sent them back to their national borders in box cars. But they did send indoctrination experts to travel with them and explain that this was hospitable treatment and that they were experiencing the welcome due to heroes.

But borders were not only crossed by friends. Smuggling became a sport. Customs barriers for anything but heavy goods simply ceased to exist. The French national monopoly on tobacco and matches evaporated, and many Frenchmen smoked real tobacco for the first time in their lives. Some of them did not like it. And there were even political consequences of the personal-flier development. In Spain, philosophical anarchists and *syndicalistas* organized political demonstrations. Sometimes hundreds of them flew all night long to rendezvous above the former royal palace in Madrid—now occupied by the Caudillo—and empty chamber-pots upon it at dawn. Totalitarianism in Spain collapsed.

The Russian rulers were made of sterner stuff. True, the Iron Curtain became a figment. Political refugees from Russia returned—sometimes thoughtfully carrying revolvers in case they met somebody they disliked—and disseminated capitalistic propaganda and cast doubts upon the superiority of the Russian standard of living. Often they had wrist watches and some of them even brought along personal fliers as gifts to personal friends. Obviously, this sort of thing was subversive. The purity of Soviet culture could not be maintained when foreigners could enter Russia at will and call the leaders of the Soviet Union liars. Still less could it survive when they proved it.

So the Soviet Union fought back. The Army set up radars to detect the carriers of anti-dialectic-materialism propaganda. The Ministry of Propaganda worked around the clock. People wearing wrist watches were shot if they could not prove they had stolen them from Germans, and smugglers and young men flying Sovietward to ply Russian girls with chocolate bars were intercepted. For almost a week it seemed that radar and flying infantry might yet save the Soviet way of life.

But then unprincipled capitalists dealt a new foul blow. They advertised that anybody intending to slip through the Iron Curtain should provide himself with Bouffon's Anti-Radar Tin Foil Strips, available in one-kilogram cartons at all corner shops. Tin foil strips had been distributed by Allied bombers to confuse German radar during the last war. Smugglers and romantic young men, meditatively dripping tin foil as they flew through the Russian night, made Russian radar useless.

Nothing was left but war. So a splendid, overwhelming blow was planned and carried out. In two nights the entire Soviet force of flying infantry was concentrated. On the third night four hundred thousand flying infantry went sweeping westward in an irresistible swarm. The technique had been worked out by the General Staff on orders from the Politbureau to devise immediately a new and unbeatable system of warfare—or else. The horde of flying warriors was to swoop down from the darkness on Western European cities, confiscate all personal fliers and ship them back to Russia for the use of reinforcements. There could be no resistance. Every part of an enemy nation was equally reachable and equally vulnerable. Russian troops could not be bombed, because they would be deliberately intermixed with the native population. There could be no fighting but street-fighting. This would be war on a new scale, invasion from a new dimension; it would be conquest which could not be fought.

The only trouble was that practically every square mile of European sky was inhabited by somebody enjoying the fruits of Russian science in the form of a personal flier. And secrecy simply couldn't be managed. All Europe knew just about as much about the Russian plan as the Russians did.

So when the clouds of flying infantry came pouring through the night, great droning bombers with riding-lights and landing-lights aglow came roaring out of the west to meet them. There were, to be sure, Soviet jet-fighters with the defending fleet. They tangled with the Russian escort and fought all over the sky, while the bombers focused their landing-lights on the infantry and roared at them. The sensation of being ahead of a bellowing plane rushing at one was exactly that of being on a railroad track with an express train on the loose. There was nothing to do but duck. The Russian soldiers ducked. Then the

bombers began to shoot star shells, rockets, Roman candles and other pyrotechnics. The Russian troops dispersed. And an army that is dispersed simply isn't an army. When finally vast numbers of enthusiastic personal-flier addicts came swooping through the night with flashlights and Very pistols, the debacle was complete. The still-fighting planes overhead had nothing left to fight for. Those that were left went home.

When dawn came the Russian soldiers were individuals scattered over three separate nations. And Russian soldiers, in quantity, tend to fight or loot as opportunity offers. But a Russian soldier, as an individual, craves civilian clothes above all else. Russian soldiers landed and tried to make deals for their flying equipment according to the traditions of only a few months before. They were sadly disillusioned. The best bargain most of them could make was simply a promise that they wouldn't be sent back home—and they took that.

It was all rather anticlimactic, and it got worse. Russia was still legally at war with everybody, even after its flying infantry sat down and made friends. And Russia was still too big to invade. On the other hand, it had to keep its air force in hand to fight off attempts at invasion. Just to maintain that defensive frame of mind, Allied bombers occasionally smashed some Russian airfields, and some railroads, and—probably at the instigation of decadent capitalists—they did blow up the Aviation Production factories, even away off in the Urals. Those Ural raids, by the way, were made by the United States Air Force, flying over the North Pole to prove that it could deliver something besides condensed milk at long distances.

But the war never really amounted to much. The Allies had all the flying infantry they wanted to use, but they didn't want to use it. The Russians worked frantically, suborning treason and developing black marketeers and so on, to get personal fliers for defense, but Russian civilians would pay more than even the Soviet government for them, so the Army hardly got any at all. To correct this situation the Supreme Soviet declared private possession of a personal flier a capital offense, and shot several hundred citizens to prove it. Among the victims of this purge, by the way, was the Nuclear-Fission man who had worked out the personal flier from Professor Rojstvensky's figures. But people wanted personal fliers. When owning one became a reason for getting shot, almost half the Russian government's minor officials piled out of the nearest window and went somewhere else, and the bigger officials kept their personal fliers where they could grab them at any instant and take off. And the smuggling kept on. Before long practically everybody had private fliers but the army—and flier-equipped soldiers tended to disappear over the horizon if left alone after nightfall.

So the Soviet Union simply fell to pieces. The Supreme Soviet couldn't govern when anybody who disagreed with it could go up the nearest chimney and stay gone. It lost the enthusiastic support of the population as soon as it became unable to shoot the unenthusiastic. And when it was committed to the policy of shooting every Russian citizen who possessed proof of the supreme splendor of Russian science—a personal flier—why public discipline disappeared. Party discipline went with it. All discipline followed. And when there wasn't any discipline there simply wasn't any Soviet Union and therefore there wasn't any war, and everybody might as well stop fooling around and cook dinner. The world, in fact, was remade.

Undoubtedly the world is a good deal happier since Professor Rojstvensky thought of an interesting inference to be drawn from the Bramwell-Weems Equation while at his breakfast of red-cabbage soup and black bread. There are no longer any iron-bound national boundaries, and therefore no wars or rumors of wars. There are no longer any particular reasons for cities to be crowded, and a reasonably equitable social system has to exist or people will go fishing or down to the South Seas, or somewhere where they won't be bothered.

But in some ways the change has not been as great as one might have expected. About a year after the world was remade, an American engineer thought up a twist on Professor Rojstvensky's figures. He interested the American continental government and they got ready to build a spaceship. The idea was that if a variation of that brass-sodium-nickel bar was curled around a hundred-foot-long tube, and metallic sodium vapor was introduced into one end of the tube, it would be pushed out of the other end with some speed. Calculation proved, indeed, that with all the acceleration possible, the metallic vapor would emerge with a velocity of ninety-eight point seven percent of the speed of light. Using Einstein's

formula for the relationship of mass to speed, that meant that the tube would propel a rocketship that could go to the Moon or Mars or anywhere else. The American government started to build the ship, and then thought it would be a good idea to have Professor Rojestvensky in on the job as a consultant. Besides, the world owed him something. So he was sent for, and Congress voted him more money than he had ever heard of before, and he looked over the figures and O.K.'d them. They were all right.

But he was typical of the people whose happiness has not been markedly increased by the remade world. He was a rich man, and he liked America, but after a month or so he didn't look happy. So the government put him in the most luxurious suite in the most luxurious hotel in America, and assigned people to wait on him and a translator to translate for him, and did its very best to honor the man who'd remade the world. But still he didn't seem content.

One day a committee of reporters asked him what he wanted. He would be in all the history books, and he had done the world a great favor, and the public would like him to be pleased. But Professor Rojestvensky shook his head sadly.

"It's only," he said gloomily, "that since I am rich and the world is peaceable and everybody is happy—well, I just can't seem to find anyone who knows how to make good red-cabbage soup."

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