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EARLY POSTAL ROCKETS IN AUSTRIA: A MEMOIR+

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My interest in space research and rocketry dates back almost to its active beginning. Some impressions, way back in my childhood, shaped my thinking and became the motivating force for my later experiments. I shall therefore attempt to reminisce about some early developments that established my contact with space research. I was born in Schwertberg, Austria, on May 14, 1902, and the first event that made a permanent impression on my mind occurred in 1910, when space forced itself directly to man's attention. The Earth had to pass through the tail of the Halley comet. The fact that cyan and carbon monoxide bands had revealed in its spectrum brought about deathly fears, and men were not sure whether they faced disaster. This event marked a new phase in human thought after it became evident that space was not that hostile; one could dare to explore it. The event became the motivating force for my later rocket experiments.

There was still another decic g factor that led me toward rocketry. The mai connections to the surrounded Fort Przemysl broke down in 1915 during World War I. A close relative had died in act , and we had no news from some friends there for some time. The paper balloons faile to reach their destination. I was still in high school when I suggested to my professor that we propose the delivery of mail by means of rockets to the Department of War. Unfortunately, the War Department did not take up this suggestion. After the war, on September 8, 1919, I made a completely new experiment whose significance I recognized only some years later. I developed a group rocket from which another rocket was fired, similar to the now commonly used step rockets. Thus I could reach great heights and cover long distances with relatively low expenses.

In 1923 I made the acquaintenance of Prof. Victor Hess who had discovered cosmic rays in 1914 and received the Nobel prize later for this discovery. Impressed by Professor Hess's lectures, I started a series of investigations on the influence of intense short wave radiation on cell plasma (plant buds) at the University of Graz, in

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++An early experimenter with solid-propellant rockets and rocket mail delivery systems in the 1920s and 1930s.

addition to my studies at the Institute of Technology. Although this type of investigation would be important for future space adventures, I abandoned research in this field after I realized that the bacteria and bacilli would go through mutations, and that I might not be able to control their multiplication. So I burned all the radiated plants.

In the 1920s I started some preliminary rocket experiments towards space flight. But first of all I had to convince my professors, who considered my ideas on space flight as a scientific illusion because of my youthful eagerness to assume that space flight was possible. My experiments were carried out in miniature scale. I developed a "micro start tower" which permitted me to test the over-all efficiency of rocket nozzles at various pressures; under the hood of a vacuum pump I fired tiny rockets and tested their efficiency while the air was evacuated. This experimental set-up was not further used in space research, but it was decisive for convincing some of my professors that the efficiency indeed increased with lower pressures.

Unfortunately the vacuum pump at my disposal did not work fast enough. I decided, therefore, to fire a multistep rocket with highly explosive fuel from a balloon at a height of 15,000 meters and test its space suitability right there. The balloon FS 1 was the transport of the small rocket, but it had also to perform some scientific experiments which I could financially afford. The balloon was furnished with magnetized steel wires to hold it in a predetermined east-west position which could be accomplished due to the minimal surface friction at these heights. The rocket was fired in the direction of the Earth's revolution: eastwards. Furthermore, the steel wires had to hold an aluminum flag (300 cm x 70 cm) in a certain position relative to the Sun so that it could reflect the Sun's rays to an observation post on Earth. Thus one could pursue the position of the balloon despite its height. The rocket was also furnished with an aluminum foil top for Sun reflection.

Unfortunately nobody seemed interested in my stratoballoon, and no observatory entered into this experiment. Anyhow, the balloon was found in Hungary and was sent back to me. I should add that my stratoballoon carried some silveracide which would explode at a high altitude. Due to the low density of the air at 15,000 m altitude, visible clouds of ionized dust should eventually form, and the dispersed matter could be moved out of the Earth's gravitational field by solar light pressure. I chose silveracide for my experiments in space since I had tested it before in ground explosion experiments: a grain of silveracid on a steel sheet brought about a strong explosion because the steel proves less tense than the layer of air on top. The brisance makes the air more rigid than the metal and thus a feather will balance in the air above the exploding silveracid without moving, while the steel sheet is deformed. In silveracide explosions with iron present, finely dispersed matter can be detected (similar to the blackening of the inner wall of long used electric bulbs) which is sensitive to light pressure.

My aim was always the construction of space rockets, but I realized of course that a single person would never have the financial means to accomplish it. I hoped that

I might find someone to support the construction of postal rockets with automatic controls, but my hopes were disappointed. In July 1928, I started alone on the solid-propellant postal rockets V-1 and V-2. They were automatically controlled, landed with parachutes, and carried letters with the remark "The final aims of my experiments are postal rockets and space flight." After I had saved some more money to finance further experiments, I constructed V-3 and V-4 in March 1930, and V-5 and V-6 in May 1930. V-5 carried letters where I stated". . . it is theoretically possible to deliver mail from Europe to America via rockets within 40 minutes . . . it is theoretically possible to reach any point on Earth in less than one hour with rockets . . . it is theoretically possible to leave Earth with rockets: space flight." But V-6 failed and the letters were partly burned (Figures 1 through 3).

For experimental purposes I built relatively small rockets about 30 cm long, first of all because I could build them more uniformly, furthermore there was no danger of explosion and they didn't need a parachute for landing. The opening of the parachute (at the right moment) housed in the top of the rocket always proved the most complicated detail in these experiments, and I never solved this problem to my complete satisfaction.

In those years I gained experience that was of advantage at the first public postal rocket flight (V-7) on February 2, 1931, from the Schoeckl Mountain to Radegund. This flight was extraordinarily successful; 102 pieces of mail were delivered and I proved that this new system held out prospect for a fast and reliable postal delivery, especially to isolated mountain areas. But economics forced me to use some rockets twice, adding new fuel cores. Repairing the damage to the casings, however, finally proved to be more costly in time and money than a complete new construction.

In April 1931 I launched three sounding rockets with home-made recording equipment: a spectrograph with Zeiss prisms, and instruments to record the pressure, height, and vibrations. Unfortunately the high initial acceleration and pressure during launch damaged the instrumentation. One rocket was constructed like a Greek column with parallel grooves along the longitudinal axis that had been worked into the aluminum casing to prevent rotation during the flight; this should have permitted an undisturbed spectrum recording. The second rocket, on the other hand, I provided with diagonal grooves in its casing for fast rotation. My purpose was to improve guidance accuracy (like in a spinning centrifugal top) and, furthermore, the rotation could aid in simulating gravitation, at least to a small extent, a feature that might benefit manned space flights. Both models of the sounding rocket were constructed with intermittent thin layers of non-inflammable material between the solid fuel and casing in order to accomplish an undisturbed and shockfree operation of the measuring equipment.

Late in the year, on September 9, 1931, I launched postal rocket R-1. It carried 333 pieces of mail, including 33 special delivery letters. With this enormous

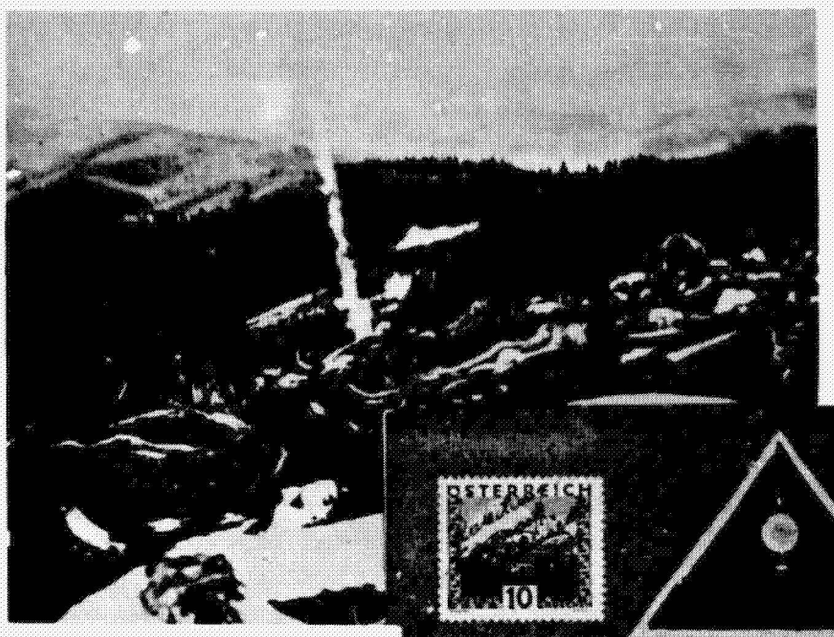

Fig. 1
Mail Rocket Launch,
1928

Fig. 2
Postal Stamps Used for the
Rocket Mail

Fig. 3
Sample of Mail Posted Between 1928-1930

success I hoped to draw public attention to my experiments and locate someone to support my plans for futher research: the construction of a rocket capable of crossing the English Channel (I started preliminary tests in 1932) and, as for the dream of my life, the construction of a space rocket. Such efforts were way beyond my personal financial means, requiring at least three wagon loads of solid fuel which, I am still convinced, is best suitable for space.

However, my endeavours to stimulate world-wide interest in space flight were ineffective. I submitted articles and rocket stamps to the major world newspapers, but only one of them bothered to answer--and then with an apology that the subject was not suitable for its readers. To my knowledge, there was never one single word printed, although The New York Times finally asked for the copyright for all reports on my rocket flights, and reporters appeared to take photographs. I was personally distressed that my postal rocket successes received so little recognition.

I want to say a few final words on my experiment V-8, which took place on October 28, 1931. I launched the rocket with a selen cell as an optical control which should have set its course toward a lighted balloon. This rocket was intended as a preliminary test for future flights towards a star or an airplane containing a light beam. Unfortunately, this night flight failed.

I continued building postal rockets until 1935. They were constructed as group and step rockets as well, but they never exceeded the weight of 30 kg because I could not afford to build bigger ones. Though each was built differently, all of them were intended to advance the cause of space flight. Later, I destroyed nearly all of my research notes and photographs of rocket launches and proceedings, for fear they might be used by the military. I abandoned space research entirely after World War II.

In the years that have followed, rocketry has gone through impressive advances, best reflected perhaps by that enormous success of science and technology: manned flight to the moon.