Galaxy
SCIENCE FICTION

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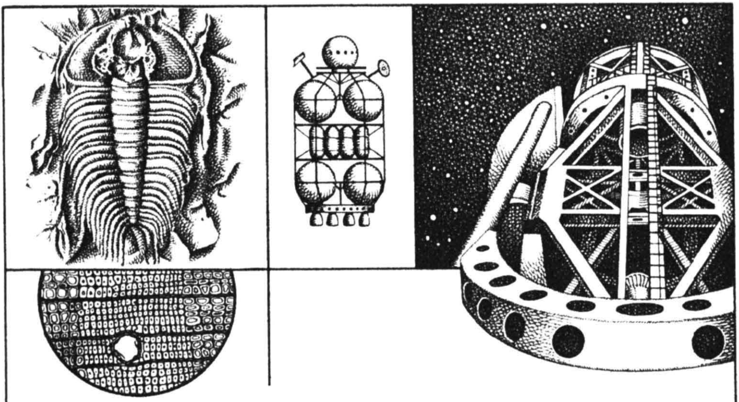
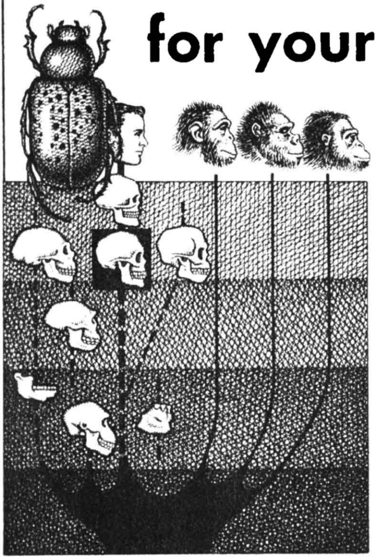
PARTY OF THE TWO PARTS
By William Tenn



for your information

By WILLY LEY



MAIL BY ROCKET

EARLIER this year, the aviation magazines carried a short official announcement to the effect that a committee had been appointed to study the feasibility of using guided missiles for peacetime service as robot mail vehicles.

This announcement must have struck many people as a brand-new idea. Actually, it is one of those ideas that have been around for quite a while in a kind of embryonic form and are now approaching realization. The earliest type of missile mail is one you've probably seen in historical movies—the parchment wrapped around the shaft of an arrow, tied securely and shot into the castle, or out of it, depending on the plot of the story.

A more modern version of the same idea was presented to an astonished and presumably incredulous readership in 1810 by a long defunct newspaper, the Berlin *Evening News* (*Berliner Abendblätter*). If it had been written by an otherwise unknown newspaperman of that period, nobody might remember it any more; but it so happens that the author was a still respected German poet of the time. His name was Heinrich von Kleist and he was the editor of that paper.

The issue of October 10, 1810, carried under the general heading of "Useful Inventions" an article entitled "Preliminary Thoughts about Mortar Mail." It began by stating that an electrical telegraph had been recently invented, but fast as it was, it could only transmit very brief messages, being wholly inadequate for the transmission of letters, reports, miscellaneous enclosures and packages. This, the article continued, could be remedied by the introduction of a system that ought to work "at least within the confines of the civilized world."

If one established a number of fixed batteries of mortars or howitzers within range of each other and all located on soft ground, these batteries could fire letter-filled shells from station to station. "As a quick computation will show," the author went on, a letter dispatched by this means would cover the distance from Berlin to Stettin (75 miles) or to Breslau (180 miles) in half a day or in about one-tenth the time required by a mounted courier.

THE next issue of the paper carried a letter by a "resident of the city"—presumably the editor—which states that the writer considers neither the electric telegraph nor the mortar mail as "useful inventions." Since most news is bad news, a really useful invention would be one which slows the mails down; ox-cart mail might be the proper solution to the problem. Whether Heinrich von Kleist was merely trying to amuse himself and his readers or whether his slightly mocking style was designed as camouflage for some wishful ideas in the back of his mind is something nobody will ever be able to establish. At any event, no mortar mail was ever tried.

But later in the nineteenth century, something that looks more modern by far was actually done—in the South Seas, there was a genuine rocket mail.

The rockets used were very large blackpowder missiles of the Congreve type; the place where they carried mail canisters was the Tonga Islands to the south of Samoa. By air, the rockets bridged difficult reefs. But since quite a number of canisters were never found and others split open on impact, so that the sea water ruined the mail, this experiment did not last long. It was discarded in favor of "buoy mail," which was somewhat more reliable.

The missile-mail idea was shelved until modern rocket theory came along three decades ago. Interestingly enough, however, of the two classical works which started rocket theory, neither Dr. Robert H. Goddard's study of 1920 nor Professor Hermann Oberth's long paper of 1923 says a word about mail transportation by rocket. This notion occurred to Oberth in 1927 in the course of correspondence with one Dr. Franz von Hoefft, who was then president of the Austrian Rocket Society. It assumed definite shape for the first time in a lecture delivered by Professor Oberth during the first days of June 1928, on the occasion of the annual meeting of the Scientific Society for Aeronautics in Danzig.

The manuscript for the lecture contains the following statement, never before published in English:

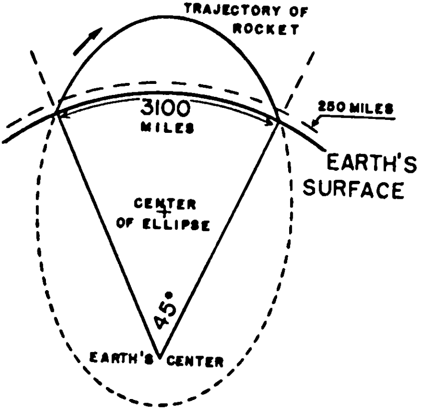
> I would suggest, therefore, to begin with the building of small rockets with automatic guidance that can bridge distances from 600-1200 miles and carry a payload of 22-44 lbs. Several factors that I cannot discuss now because of lack of time happen to facilitate the automatic guidance of a rocket so that, in my opinion, it should be possible to pre-determine the place at which the rocket returns into the atmosphere with an uncertainty of only a few miles.
>
> This rocket, therefore, seems suitable for transporting urgent mail over long distances in a very short time. The rocket would have to land by means of a parachute; some other means of transportation would then carry the apparatus to its precise destination. At a later date, I would equip such a rocket with a powerful booster that would result in transoceanic ranges. The booster rocket would drop off after one minute and should be easy to locate.

AFTER this lecture, it became customary among rocket enthusiasts to consider the mail-carrying rocket the "second step in rocket development." The first step, following preliminary and purely experimental models, would be the high-altitude instrument-carrying research rocket, vertically rising; the second step, the long-range rocket with a payload consisting of mail. When it looked, in 1929, as if an early prototype of the high altitude research rocket would be realized very soon, a German journalist interviewed the American Ambassador, Dr. Shurman, about his attitude toward transatlantic rocket mail.

Ambassador Shurman wisely refrained from having opinions about technological detail. "Just two years ago," he told the journalist, "the chair you are sitting in was occupied by Dr. Eckener of the Zeppelin works, who talked to me about transatlantic mail by dirigible." But the Ambassador did give an opinion on the legal procedure required.

If it had been proved, he said, that the rocket would not represent any danger to life or limb or the property of American citizens, the proper thing to do would be to ask for permission at the U. S. Embassy. The Ambassador would then forward this request by cable to the Department of State, the Department of State would pass it on to the President, and the President would call a cabinet meeting, which would make the final decision on the matter.

How such a transatlantic mail shot would have looked, and would still look, is shown in Fig. 1. After initial vertical takeoff, the rocket would climb out of the atmosphere at a slant, reach a rather great height at the mid-

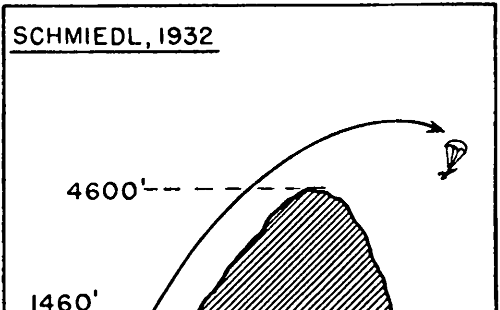


way point, and dip into the atmosphere again 35 minutes later, more than 3000 miles from its takeoff point. (The distance shown on the diagram is the Great Circle distance between New York and Cobh.)

Everything the newspapers told during 1929, from the announcement of the first forthcoming high-altitude shot to 40 miles to the interview with the Ambassador, sounded most impressive, but unfortunately things got stuck at that point. The first long-range rocket did not lift off its launching table until 13 years later and then it was slated to carry a payload of high explosive, instead of mail, good or bad. In this instance, the news was bad—in England.

DURING those 13 years, the story of the idea of the mail rocket described a strange curlicue. The theoreticians of the mail rocket, with a large expenditure of long equations, had always been thinking in terms of oceans, deserts and steppes.

In 1931, a very young Austrian engineer by the name of Freidrich Schmiedl had quietly established still another possibility. Living in the Austrian Alps, he was aware of the fact that two villages might be eight hours' walk from each other, yet less than two miles away as the rocket flies. He had built half a dozen experimental rockets, had tinkered himself a reliable parachute release system, and on the second of February, 1931, he had



put 102 letters into a compartment of his seventh rocket and fired it across a mountain. After another experimental shot, there followed a rocket labeled R-1 with 333 letters and then, through the year 1932, five others.

Rocket R-1 stood 5.6 feet tall, had a largest diameter (near the head) of 9.6 inches, a smallest diameter (at the tail end) of 9.25 inches, had an empty weight of 15.4 lbs. and was propelled by a charge of 52.8 lbs. of a special blackpowder mixture. It was made of several layers of thin sheet brass, wound, for strength, with twine soaked in hot carpenters glue. The outside skin was sheet aluminum and between the charge and the sheet brass there was a layer of asbestos. The purpose of the asbestos was to minimize heat conduction forward through the metal skin. Without this precaution, such conducted heat might ignite the still unburned front end of the charge and cause an explosion.

Schmiedl's experiments demonstrated that the old Tonga Islands problem of shooting at short range over obstacles (mountains, in his case) was still very much alive. One could also think of a few possible applications where there was no real obstacle, but a special set of circumstances. For example, a ship coming from America might pass the extreme western end of England, Land's End, within rocket range, but would not berth in an English port for another 12 hours—or even later if, as is often done, the first port of call is a French harbor. The mail could then arrive ahead of the ship.

Schmiedl's mail shots were imitated (usually less successfully) in many other countries, such as Germany, England, Holland, the U.S.A., Cuba, India and Australia. The bill was usually footed by stamp collectors who, in the hope of future rocket mail, wanted to accumulate "forerunners."

Then came the second World War, bringing the military bombardment rocket, which, from this point of view, might be considered a highly efficient and mass-produced short-range "obstacle rocket." And it brought the first real long-range rocket. But it failed to produce the mail rocket, unless you want to count the use of bombardment rockets for showering leaflets on the enemy under this heading.

IT is a rather safe prediction to say that the long-range mail rocket will not become a reality in the form in which it was talked about in 1929. There are two main reasons. One is political. As things stand right now, no government could dare to permit international mail transportation by long-range rocket. If such rockets began to show on the radar screen of the receiving station, the radar operator—and everybody else concerned—would wonder whether they really carried mail. They might not even come from the announced firing site.

The second reason is that the transatlantic timetable has undergone a fundamental change. At the time when the American Ambassador was asked about his opinions, the reasoning ran as follows:

The rocket would need about ½ hour for the actual trip across the Atlantic. If you counted on one hour's delay at the European (or firing) end and about 1½ hour's delay at the receiving end where the rocket had to be fished out of the water and the mail sorted, a letter might make the trip from "house to house" in three hours. Since the time difference between Berlin and New York is six hours, it would even look as if the addressee received his mail three hours *before* it was mailed.

Even assuming only four mail rockets per day, it was virtually certain that the majority of the letters would reach the addresses on the day they were mailed. Compared to the steamer schedule, which involved an interval between mailing and delivery of at least one week, this was a nice and probably important time-saving.

But the mail plane needs only about eight hours to cross the ocean. Recently, my German publisher wrote me an airmail letter on a Friday and had my reply the following Monday, without special delivery at either end. Less than two years from now, the transatlantic mail planes will be turbojets requiring, say, six hours for the flight. And another two years later, this time might be reduced to five or even four hours. The long-range unmanned mail rocket has been effectively killed off by the fast long-range manned airplane.

THE mail-carrying missile, however, is a different story. It might be useful to mention at this point that all missiles, no matter how large their number, can be sorted into just two categories.

One type of missile is the real rocket, which does not rely on the air for "lift" the way an airplane does. In fact, the rocket missile tries to get out of at least the denser layers of the atmosphere as quickly as can be managed in order to gain maximum speed, because a real rocket operates at full efficiency only in a vacuum. Like an artillery shell, it moves along a trajectory, and this group of missiles is therefore referred to as "trajectory missiles."

The other group of missiles is winged, aerodynamically supported like an airplane, and "flies" like an airplane. It does not follow a trajectory, but a flight path, and these aerodynamically supported missiles are therefore known as "flight-path missiles" or "cruising missiles."

The V-2 rocket is a true trajectory missile. The old German V-1 or buzz bomb and its offspring, the Navy *Loon* and the Martin *Matador,* are typical cruising missiles.

Of course, no cruising missile can compete with a trajectory missile when it comes to speed. But as mail carriers, they have a number of undoubted advantages.

Unlike the trajectory missile, they are controlled (or at least can be controlled) every inch of the way. Since they have wings, they can be landed like an airplane, on an airport where postal facilities already exist. They can even be "held" in the air for a short time, if necessary. Their speed can be much higher than that of commercial transports and rivals that of the fastest fighters. They can, if used as mail carriers, be used over and over again.

If they are built for comparatively small payloads, say ¼ ton, they could be launched at frequent intervals. And their operation may be cheap enough so that the rates for missile mail might be not more than perhaps triple the airmail rate.

What will actually happen will depend on the studies now under way. As of now, it looks as if a famous French saying might be adapted to read: *La fusée postale est morte; vive le projectile postal!*

ANY QUESTIONS?

Is there any basic distinction between plants and animals that also holds true for all one-celled organisms?

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The basic distinction between animals and plants is that plants have chlorophyll while animals do not. There is no animal with chlorophyll; examples in older textbooks were mistakes, caused by algae living in symbiosis with the organisms in question. Unfortunately, as far as orderly pigeon-holing is concerned, a number of plants have decided to live on organic matter and have done

away with their chlorophyll. So to make the distinction apply in all cases, one would have to say that animals are organisms that cannot have chlorophyll, while plants are organisms that can and usually do. This will apply to anything larger than a virus, to which nothing seems to apply.

Would you please explain how the Moon rotates keeping always one face toward the Earth? Also, why Mercury always keeps one face toward the Sun?

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Apparently many people have some difficulty visualizing how one celestial body can revolve around another one in such a manner that only one-half of the revolving body is visible from the central body. I have even been asked on occasion whether one should not say that neither the Moon nor Mercury rotates at all. They do rotate, however, and the problem can be best understood by making a little experiment.

Place a lamp on a table that has open space all around it. The lamp is the Earth and your head represents the Moon. Now if you move around the table, keeping your eyes fixed on some external point, such as a window, you revolve around the lamp (Earth) without rotating at all. The result is that the lamp will illuminate every portion of your head; translated into astronomical terms, this means that the people on the Earth could see every portion of the Moon in the course of one month.

But if you move around the table with your eyes always fixed on the lamp, you perform not only a revolution around the Earth, but also one rotation around your axis, since every portion of your head would become visible to another (stationary) observer in the same room.

All the moons in our solar system behave in this manner and, among the planets, Mercury, the one nearest the Sun. This is the inevitable result of the action of the gravitational field of a large body on a nearby small body. Naturally, since the time required for one revolution differs for the various moons of a planet with many moons, the periods required for their rotations differ, too, because they all have revolutionary periods equal to their rotational periods.

—WILLY LEY