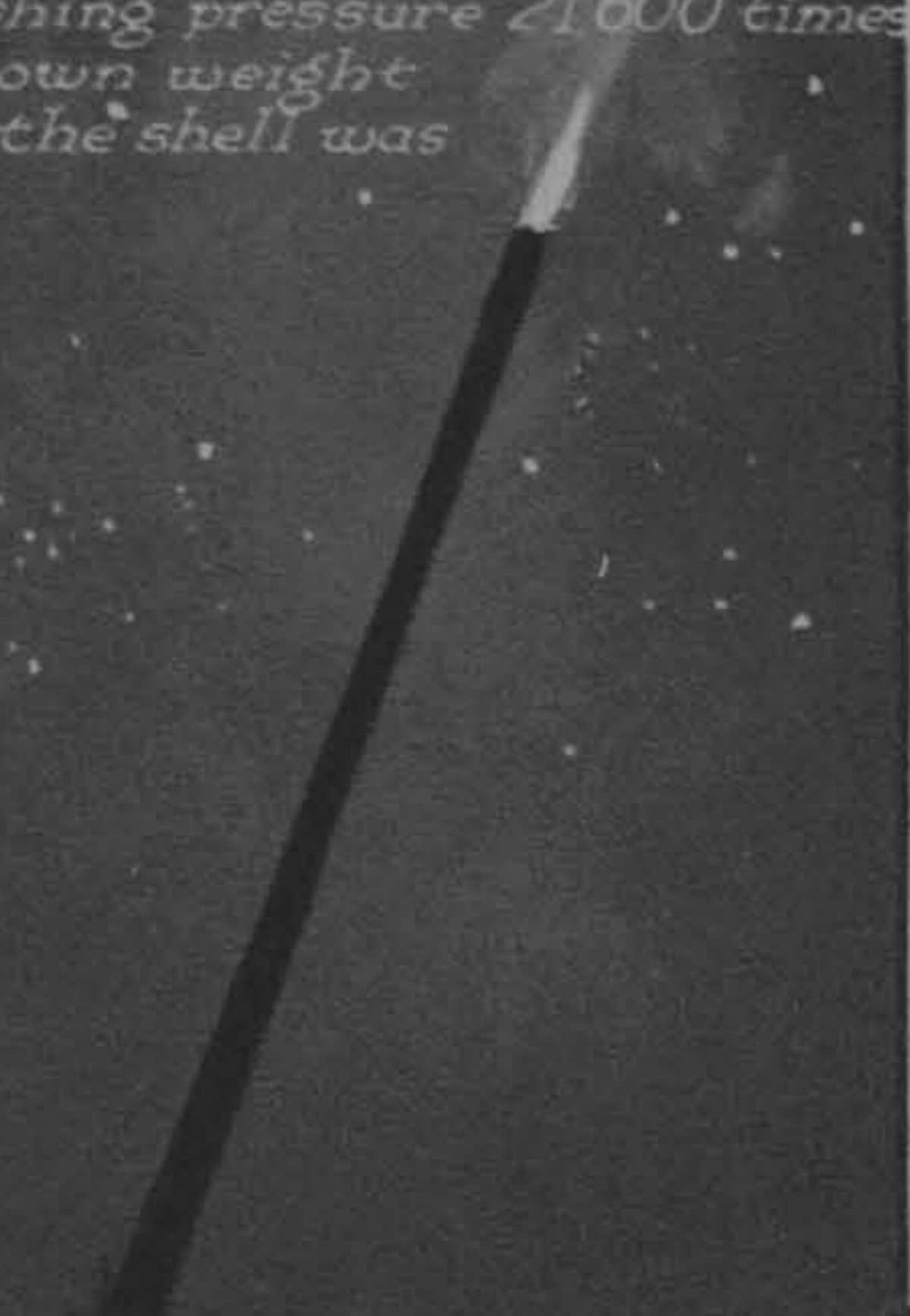
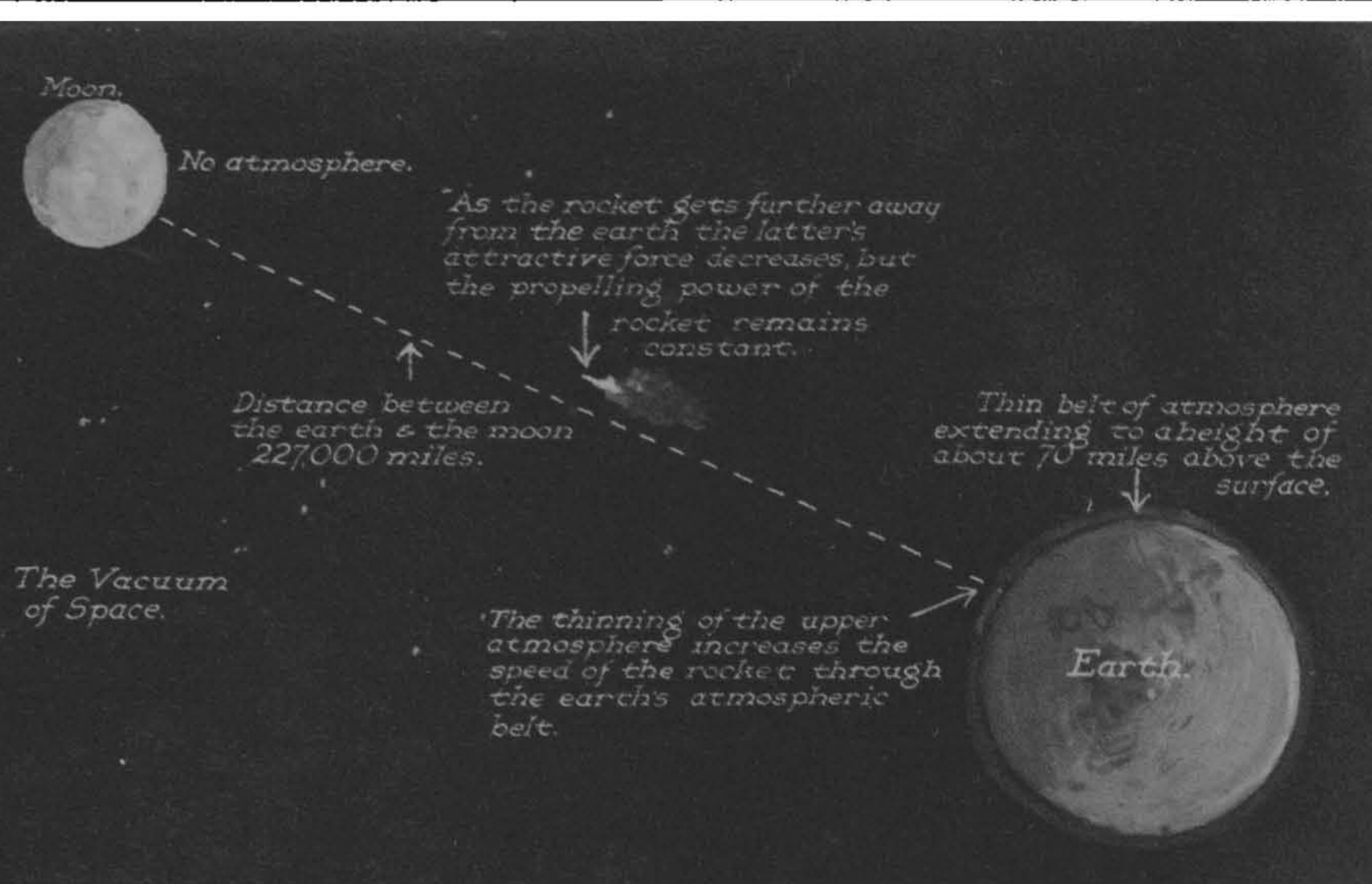


VOYAGING FROM EARTH TO MOON: POSSIBILITIES OF THE ROCKET.

Drawn by our special artist, G. H. Davis, from information supplied by M. Robert Esnault-Pelterie in a special interview. (Copyrighted.)

There is no propellant at present known powerful enough to fire a shell to the moon in excess of the earth's attractive force. Moreover, the men within the shell would have to withstand a crushing pressure 21,600 times their own weight when the shell was fired.





Distance between the earth & the moon 227,000 miles.


Thin belt of atmosphere extending to a height of about 70 miles above the surface.

The Vacuum of Space.

As the rocket gets further away from the earth the latter's attractive force decreases, but the propelling power of the rocket remains constant.

The thinning of the upper atmosphere increases the speed of the rocket through the earth's atmospheric belt.


It is calculated that it would require a gun 382 miles in length to fire a projectile at sufficient speed to reach the moon.



Perth. Edinburgh. London.

Gun 382 miles long.

The necessity of producing a speed of liberation sufficient to overcome attraction.




Moon.

(1) Rocket in normal flight.

(2) Rocket being reversed by its crew on nearing the surface.

Rocket reversed, propelling gas now acting as a brake.


No atmosphere, therefore sky is always black.



Surface of the Moon.

To prevent the rocket smashing itself on the moon's surface or on its return on reaching the earth it is suggested that provision would have to be made for turning the rocket in flight so that its propelling gases would be used as a brake.


A parachute has been suggested for breaking the fall of the rocket.



(2) Unfortunately for this suggestion the compression within the parachute would be tremendous.

(3) This would generate a temperature of 3,604 degrees Fahrenheit & instantly consume the parachute.

To be successful it is calculated that the rocket must have a liberation speed on the surface of 6,664 miles per sec. The greatest known speed today is about 3 miles per sec.

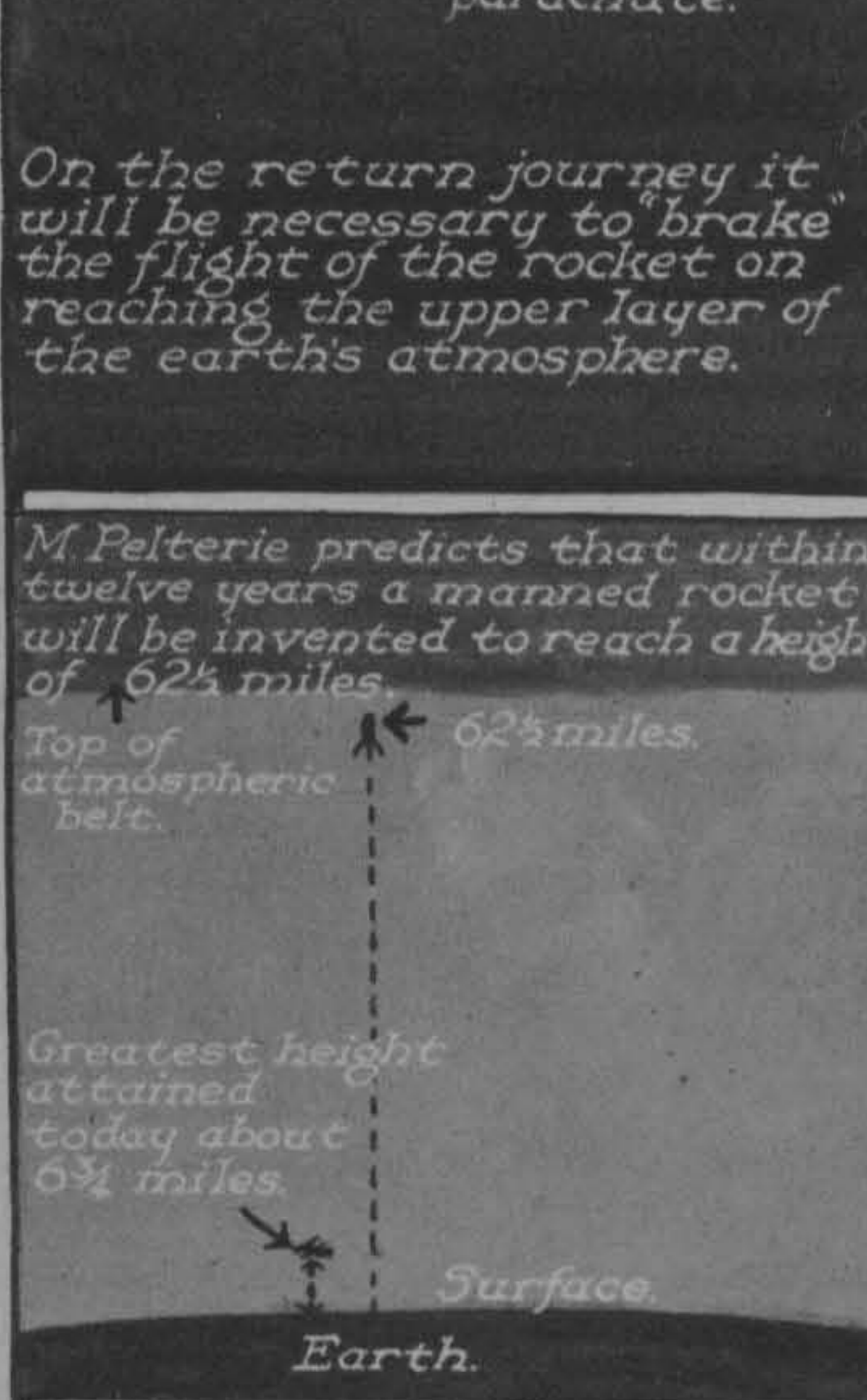


Earth.

Moon.

Assuming the rocket does not reach the speed of liberation then there will be a free fall back to earth.

On the return journey it will be necessary to brake the flight of the rocket on reaching the upper layer of the earth's atmosphere.



M. Pelterie predicts that within twelve years a manned rocket will be invented to reach a height of 62 1/2 miles.

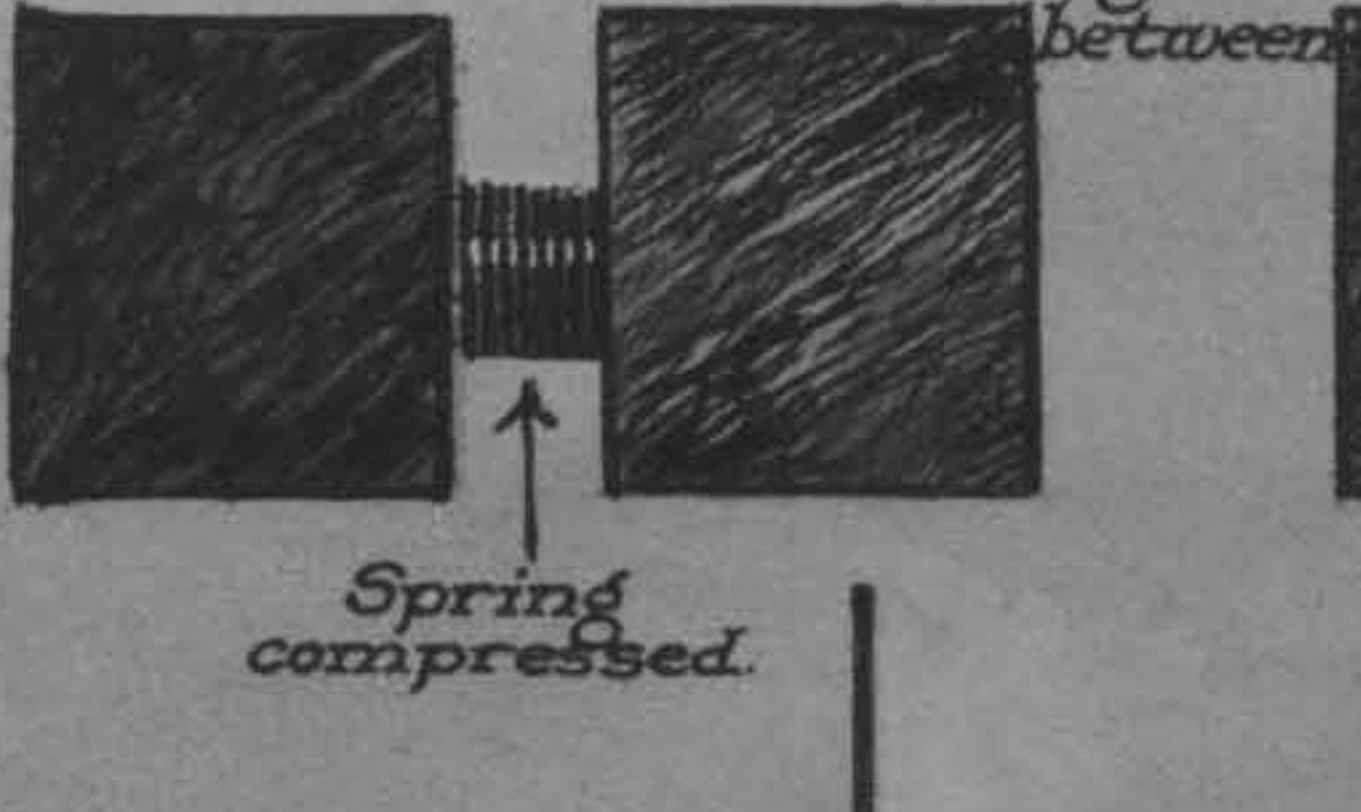
Top of atmospheric belt. 62 1/2 miles.

Greatest height attained today about 6 3/4 miles.

Surface Earth.

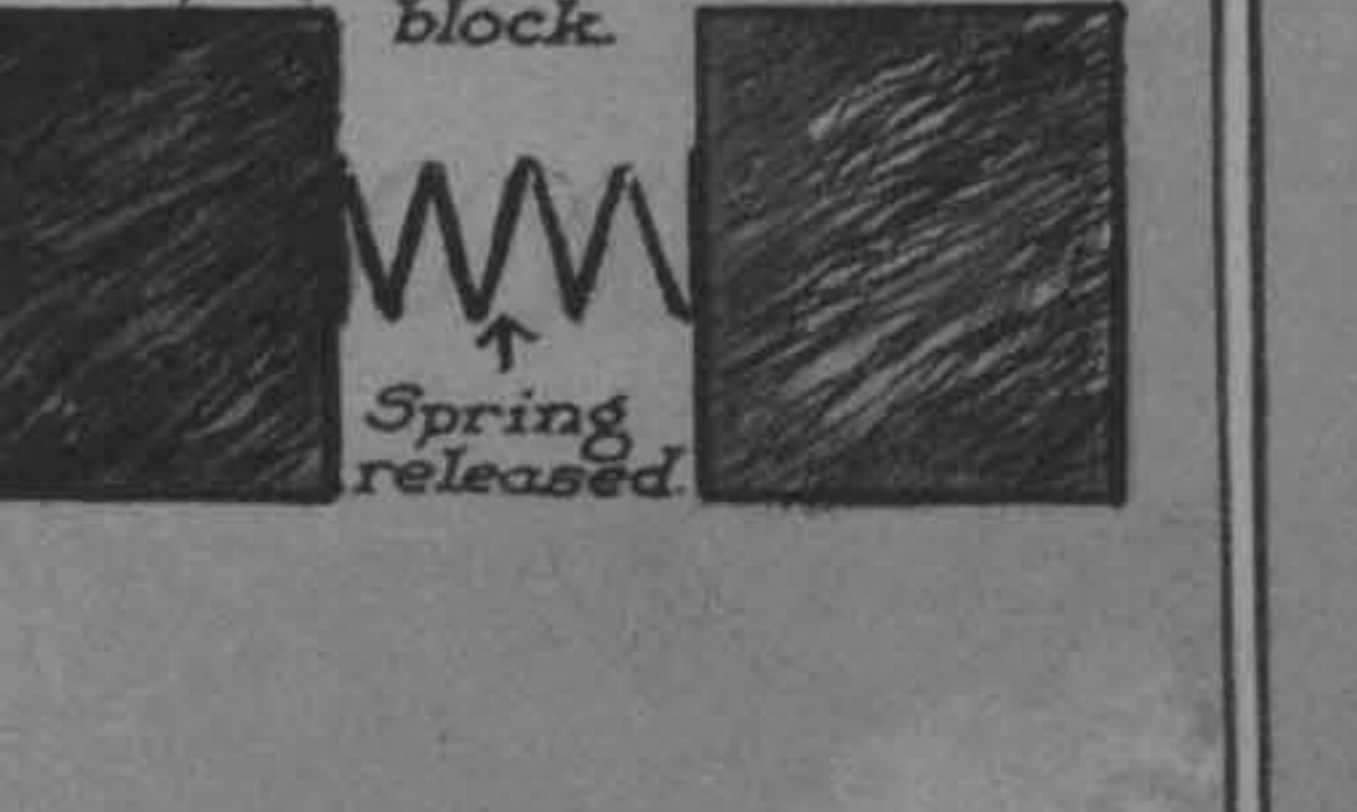
The rocket propels itself by pushing against its own exhaust gases, thus simply explained.

(1) Two blocks with a coil spring in between.




Spring compressed.

(2) When the spring is released each block will propel the other.



Spring released.

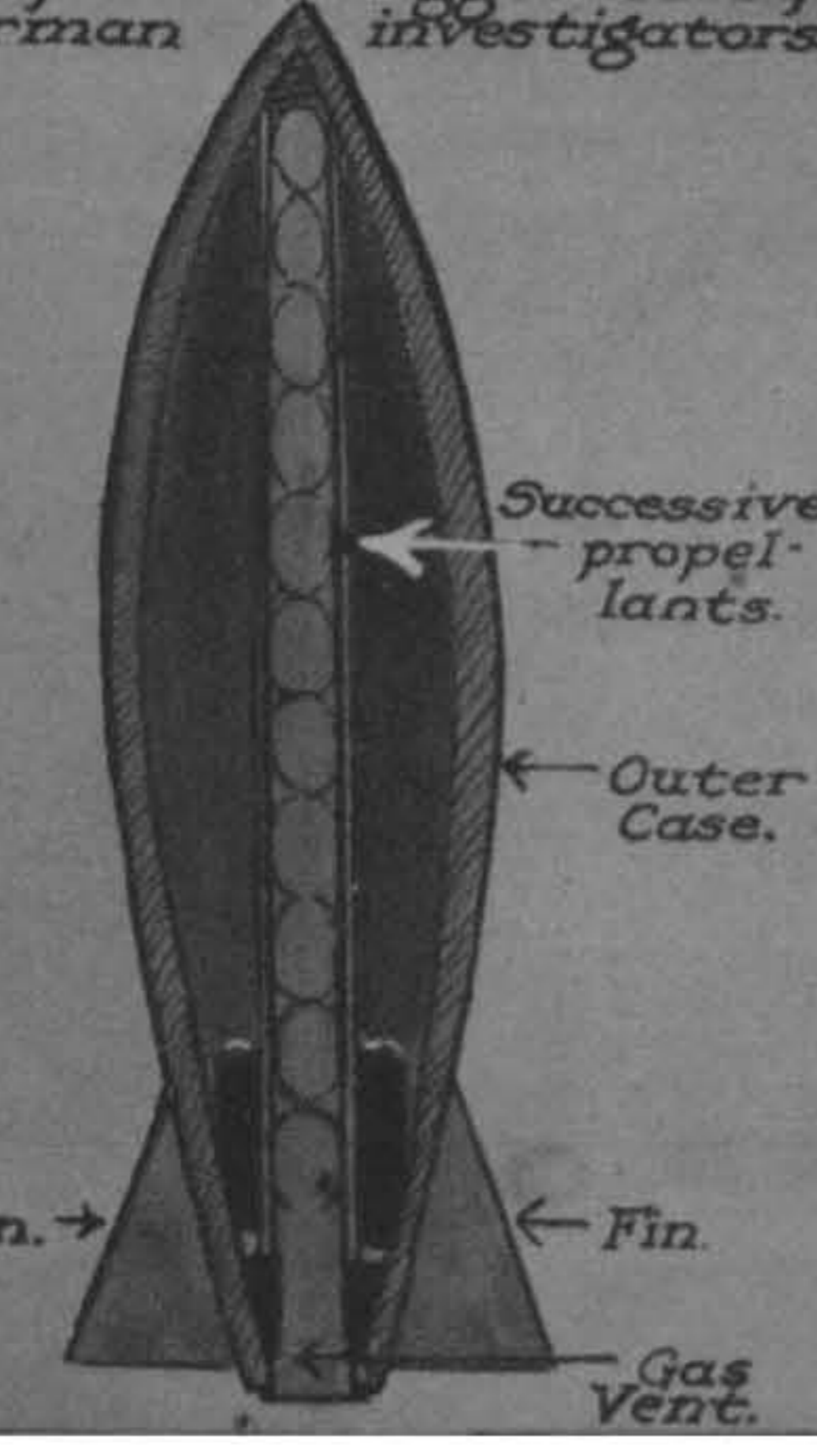
(3) Substitute a plate pushing against the atmosphere for the right hand block.



Rocket. Gas.

It is then seen how the rocket flying through space would use its own exhaust gas as a means to force it forward, there being no head resistance beyond the earth's atmospheric belt.

Type of rocket suggested by German investigators.



Successive propellants.

Outer Case.

Fin.

Gas Vent.

To propel one ton. The propellant required to reach the moon would weigh 25 tons according to latest German investigations.

To propel one ton. Former calculations were 159 tons of propellant.

To propel one ton. 519 tons of propellant.

To go to the moon & back the enormous ratio of 519 to 1 would be required.

PROBLEMS TO BE SOLVED BEFORE MAN CAN REACH THE MOON: THE SUBJECT OF A LONDON LECTURE.

Astronautics is a fascinating subject, and dreamers and fiction-writers have for years been imagining the possibilities of inter-planetary communication and a voyage to the moon. M. Robert Esnault-Pelterie, the pioneer aviator and inventor of the "joy-stick" or control-lever used in most aeroplanes to-day, has investigated the scientific possibilities of astronautics. In his recent lecture at the Royal United Service Institution, arranged with the Royal Aero Club, he reduced the whole subject to scientific facts. He at once ruled out the idea of manufacturing a huge gun and firing a shell to the Moon as suggested by Jules Verne. He explained that there was no known propellant capable of hurling a shell in excess of the Earth's attractive force; furthermore, the gun would have to be some 382 miles long, and the human cargo would have to withstand a pressure over twenty-one thousand times their own weight. As an

aeroplane could not fly in space where no atmosphere exists to support it, there remains the rocket, and it is to the rocket that scientific investigators at present pin their faith; but he suggests that probably nothing can be really effected or the problem solved until man has chained the power of the atom to his will. To encourage scientific investigation, the Société Astronomique de France are offering a prize of 5000 francs this year, next year, and in 1930, for the best original scientific work which tends towards the solution of the problem of inter-planetary navigation. Already German investigators have produced a large, highly technical book on the subject, and Herr Opel in Germany is experimenting with rocket-propelled cars and aeroplanes. As a result of these investigations, the force of the propellant required to propel a certain weight in excess of the earth's attraction and gravity has been considerably reduced.