

THE PROBLEM OF THE NAVIGATION OF SPACE

BY GARRETT P. SERVISS.

THE statement has just appeared in print that, owing to the discovery by Sir William Ramsay of a gas sixteen times lighter than hydrogen, it may become possible to send a balloon from the earth to the moon or to other planets.

If this could be done, it would be the most wonderful thing ever accomplished by man. A voyage to the moon would be an experience of indescribable novelty and infinitely more marvelous than Columbus' first crossing of the Atlantic.

Trip to the Moon May Be Made Possible Some Future Day.

But the reasoning on which the statement is based is entirely erroneous, and the fact that it is credited to a "scientist" only shows how ignorant the majority even of educated people are of the real difficulties to be overcome before a voyage in open space can be undertaken.

This seems a good occasion for showing how a trip to the moon could actually be made, provided that we had the means.

Suppose that this strange gas of unexampled lightness were produced in sufficient quantity to charge a balloon, the result would only be that we should be able to go a few miles higher than we can now go with the aid of a balloon filled with hydrogen. It would be impossible for any balloon, no matter how light and buoyant its gas, to escape from the shell of atmosphere that surrounds the earth, and which, at a height of a hundred miles becomes so rare that it is practically insensible.

I know that some persons think that if a balloon could be made to rise with so great rapidity as to reach the upper limit of the atmosphere it would then continue to move, with the momentum acquired by its ascent, out into space, and would go on uninterrupted because the resistance of the air would be gone. But this is a wrong notion.

If we could give to a projectile a velocity of about seven miles a second then we could shoot it straight up from the earth and cause it to escape from the earth's attraction. But the highest velocity that could be given to a balloon with any gas whatever would be incomparably less than this. Moreover, the velocity would rapidly decrease as the balloon got into the rare atmosphere a few miles up, because its buoyancy would depend upon the relative weight of the gas as compared with that of the

surrounding air, and the latter becomes rarer and rarer until it practically ceases to exist. The balloon then would come to rest, being unable ever to get out of the atmosphere.

In the present state of science the only solution of the problem of navigating space appears to be indicated by the property of electric repulsion. If a car could be constructed bearing an electric charge, opposite in kind to that of the earth, then perhaps it could be made to fly away in spite of gravitation, and if the repulsive force could be caused to act continuously it might go as far as the moon, or farther.

But this is only the statement of an idea. We have no means of making such an electrically charged car, and the charge that would be required is so enormous that its production seems impossible. Then, of course, there are other immense difficulties in the way. It is sufficient to state only one of them. We cannot live without breathing that mixture of oxygen and nitrogen which we call air. If a man undertook to cross the airless space between the earth and the moon he would have to carry with him some substitute for air, to say nothing of the cargo of eatables and drinkables that he would require.

Yet I personally have little doubt that if humanity continues for thousands of years to make progress in its knowledge of the laws and forces of nature comparable with what it has made in the last hundred years, and in continuation of the same, the problem of human flight in open space will be solved. But it will not be solved by the use of any gas, however buoyant.

New Gas Discovered Will Aid Possibilities of Flight.

The new gas, however—if a new gas such as is described has really been found—may add immensely to the possibilities of flight within the limits of the atmosphere. A relatively small vessel containing such a gas would possess the lifting power of a large balloon without presenting as great a surface to the wind, and it might easily be employed as an accessory to the aeroplane, enabling the latter to rise more directly and to ride the air more steadily. There would be no danger of a fall with an aeroplane furnished with receptacles containing a gas sixteen times lighter than hydrogen. Then, too, the planes might be made smaller and more manageable, while the lifting power which many inventors have been trying to obtain by vertically acting air screws would be readily supplied.