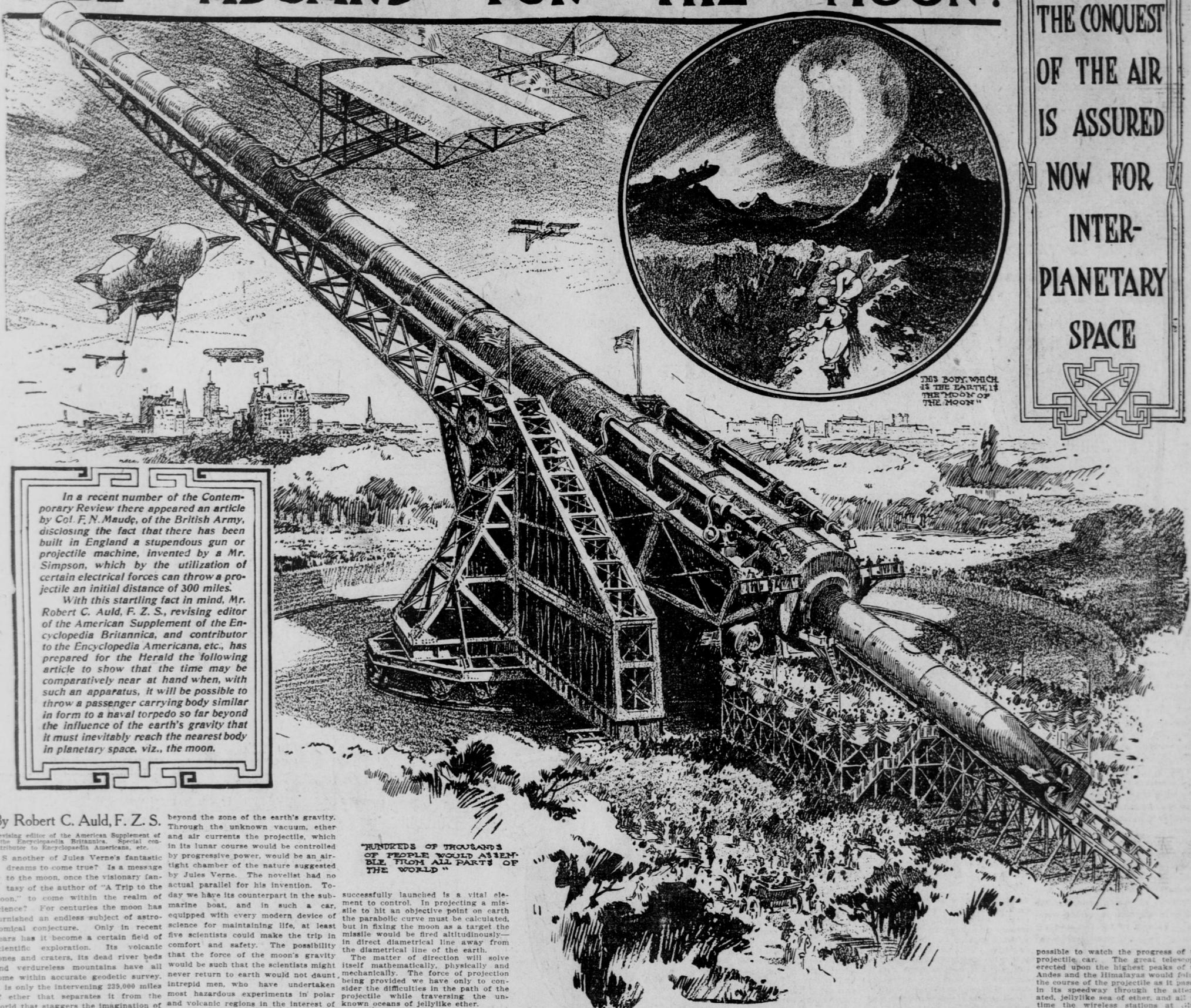


ALL ABOARD FOR THE MOON!

THE CONQUEST OF THE AIR IS ASSURED NOW FOR INTER-PLANETARY SPACE



THIS BODY, WHICH IS THE EARTH, IS THE "MOON OF THE MOON"

In a recent number of the Contemporary Review there appeared an article by Col. F. N. Maude, of the British Army, disclosing the fact that there has been built in England a stupendous gun or projectile machine, invented by a Mr. Simpson, which by the utilization of certain electrical forces can throw a projectile an initial distance of 300 miles. With this startling fact in mind, Mr. Robert C. Auld, F. Z. S., revising editor of the American Supplement of the Encyclopedia Britannica, and contributor to the Encyclopedia Americana, etc., has prepared for the Herald the following article to show that the time may be comparatively near at hand when, with such an apparatus, it will be possible to throw a passenger carrying body similar in form to a naval torpedo so far beyond the influence of the earth's gravity that it must inevitably reach the nearest body in planetary space, viz., the moon.

By Robert C. Auld, F. Z. S.

Revising editor of the American Supplement of the Encyclopedia Britannica. Special contributor to Encyclopedia Americana, etc.

Is another of Jules Verne's fantastic dreams to come true? Is a message to the moon, once the visionary fantasy of the author of "A Trip to the Moon," to come within the realm of science? For centuries the moon has furnished an endless subject of astronomical conjecture. Only in recent years has it become a certain field of scientific exploration. Its volcanic cones and craters, its dead river beds and verdureless mountains have all come within accurate geodetic survey. It is only the intervening 239,000 miles of ether that separates it from the world that staggers the imagination of the scientist and layman alike, but if the claims of a London inventor, A. S. Simpson, are true, even that vast space may be traversed with assurance and safety. Mr. Simpson has invented an electrical gun which he asserts will carry a projectile of 2,000 pounds at the rate of 20,000 feet a second for 200 miles. The actual test has not been made, but military authorities have endorsed the plans, and scientists may rejoice.

A gun with the propulsive power of the Simpson invention, having the muzzle velocity claimed for it, overcomes the chief hindrance to mortal invasion of the moon. Hitherto the problem that has perplexed scientists has been to penetrate the zone of gravity that encompasses the earth for a distance of some 150 miles. Once outside this atmospheric realm of gravity and air pressure the problem of reaching the moon, according to scientists, becomes less speculative than in Jules Verne's time. It is well known that the celebrated romancer of science founded his stories on actual knowledge of the period in which he lived. Scientific progress in the last 50 years has been great, but it sustains the French author's idea that the only feasible way of sending a message to the moon is by firing a projectile from a huge gun.

Jules Verne used 400,000 pounds of nitroglycerin to explode his charge, the concussion being so great that 5,000,000 people who saw it fired were hurled to the ground. Electricity has altered the face and the character of the earth since then, so that the dangers of concussion may be eliminated. Jules Verne's gun was mythical; there was no propulsive power known at that time to science that would project a missile beyond the zone of the earth's gravity. Only recently Professor Ernest Crane Dodge, A. M., has stated that "a body relieved of gravity would reach the moon in 10 days."

How much faster would a projectile from an enlarged Simpson gun, a veritable lunar cannon, accomplish the trip from the earth in the direction of the moon? A lunar cannon based on the Simpson plan could easily hurl its projectile

beyond the zone of the earth's gravity. Through the unknown vacuum, ether and air currents the projectile, which in its lunar course would be controlled by progressive power, would be an airtight chamber of the nature suggested by Jules Verne. The novelist had no actual parallel for his invention. Today we have its counterpart in the submarine boat, and in such a car, equipped with every modern device of science for maintaining life, at least five scientists could make the trip in comfort and safety. The possibility that the force of the moon's gravity would be such that the scientists might never return to earth would not daunt intrepid men, who have undertaken most hazardous experiments in polar and volcanic regions in the interest of the world's knowledge.

Calculating by known ordinance and speculating by existent forces, the manufacture and the discharge of a lunar gun are not beyond the realm of reason. We have for a basis the 12-inch gun, the accepted limit of an effective naval rifle. The 12-inch gun will carry a projectile weighing 370 pounds a distance of six miles. The cost of this gun is \$50,000. To fire it requires 250 pounds of smokeless powder at 50 cents a pound, or \$200, the projectile itself costing \$500.

A lunar gun of the Simpson type, large enough to hurl a projectile through the zone of gravity, would need to be thousands of times more powerful than the naval rifle. The amount of steel required in its manufacture would be greater than that used in the largest battleship in the world, and would be equal to that used in the Metropolitan Life building in Madison square, New York. In fact, the lunar gun required would be about the size of the Metropolitan building, which is more than 200 feet square and 700 feet high. The gun would cost \$2,000,000, a paltry sum in these days to devote to such an experiment. The cost of firing the lunar gun would not be great, in consideration of the results of such an exploit. The expenditure, if smokeless powder were used, would not exceed the cost of eight volley broadsides of the entire ordnance of 1,011 guns of Admiral Evans' fleet, a single broadside being estimated at \$50,000, making the expenditure for the single charge of the lunar gun \$400,000 if smokeless powder were used, which, however, is not anticipated, as will be seen later.

The recoil of a 50 ton gun would lift the Lusitania out of the water, which would render the discharge by explosion of the lunar cannon of the size described almost impossible, but, assuming the correctness of the electrical explosive power suggested by the Simpson gun, that knotty feature of the problem is eliminated. The explosive principle involved is one that has been figured, out and the recoil is so distributed and confined that it imparts the full force of its carrying power to the projectile, and therein must lie the secret of the possibility of a lunar gun that will hurl a huge projectile car of wrought steel beyond the 250 mile limit of the earth's gravity. The direction of the projectile once

HUNDREDS OF THOUSANDS OF PEOPLE WOULD ASSEMBLE FROM ALL PARTS OF THE WORLD

successfully launched is a vital element to control. In projecting a missile to hit an objective point on earth the parabolic curve must be calculated, but in fixing the moon as a target the missile would be fired altitudinally—in direct diametrical line away from the diametrical line of the earth. The matter of direction will solve itself mathematically, physically and mechanically. The force of projection being provided we have only to consider the difficulties in the path of the projectile while traversing the unknown oceans of jellylike ether.

WHERE there is no atmosphere there is a vacuum—as far as air is concerned, but not in so far as ether is concerned. But where there is a vacuum gravity at such a distance from earth loses its place. But gravity is one thing and gravitation is another. Gravitation is universal. It is a mysterious, unknown force that steers the stars in space in their courses, moving them through the ambient ether at the slow rate of 20 knots a second.

The projectile once beyond earth's gravity, how would it act? What analogy in nature have we for supposing that such a body so intruded would conduct itself in an orderly manner in its course? Will the projectile sink or move through this ethereal jelly ocean without obstruction, while the earth, moon and stars are rushing through the ether at 100,000 feet per second? Gravitation is a thing not of earth, but really of ether itself. Gravitation depends on mass and motion, which would render the projectile actually under control by the laws of nature. The movement of the projectile is simply analogous to one of these falling erratic stars that result from disruptive explosion and which become visible only when being set on fire as they strike the friction element of the atmosphere of earth in falling.

Ether's movement is directed in straight lines toward the spheres, so anything projected into it would swing into such lines of direction and would scour out its courses in such paths unless controlled by inward energy. With a propulsive regenerative energy imparted to the projectile it can wind its way through the ether even for an indefinite space, the resistance being lightened. It will proceed under electrical control until it approaches the realm of the moon, where gravity is much less than the earth, its gravity weight or mass being one-sixth less. Reaching the moon, its energy exhausted, it would fall gently on peak or vale without creating much of a jar or jolt. It is assumed in relation to the movement of the projectile that outside of the sphere of earth's gravity it would be controlled or held in its course by a rudder and screw, which would be propelled by the electric energy of its dynamo. This involves a new problem in electrical transmission, a problem already in the way of solution. Experiments are in progress which suggest the probability of creating enormous electrical waves, generated by the force of Niagara. It is the dream of the inventor to employ these wireless waves in supplying electric current at vast distances by merely tapping the wave currents. By means of a huge Marconi transmitter installed at Niagara, elec-

trical energy from which is already carried 3,000 miles with success in telegraphy, the projectile car's dynamo could easily draw the necessary current or propulsive power to direct its course through the ether, which of itself is a non-resistant to electrical energy. "When the truth, accidentally revealed and experimentally confirmed," says Nikola Tesla, in referring to the wireless telephony, which involves the principle of electric waves, "is finally realized that this planet, with all its appalling immensity as to electric currents, is virtually no more than a small metal ball, there will be no such thing as distance to disturb our peace of mind."

The actual time required for passage of the projectile from the earth to the moon is conjectured, but it would surely be less than 10 days, which is the time asserted by Professor Dodge in which an uncontrolled body, released from the earth's gravity, would be able to cover the distance. To reach the moon, then, on the basis of lunar ballistics, is merely a question for the mathematician, the electrician and the mechanical engineer. It is a matter of figures that will mark their cabalistic calculations on the tablets of time as the old fellow proceeds to greater marvels and more wisdom, which entitles us to speculate in detail according to the knowledge we already have, at last. The powers of electricity mediumized by radiating force will make the propulsion of the huge 270 ton projectile silent, vibrationless, straightway to the moon.

What would the exact size of this projectile be? To facilitate to the best advantage all known experimental science in the service of this trip to the moon the projectile would be equipped like the submarine boat Octopus. Its length would be 100 feet and its beam 12 feet. The cost of the projectile would be a trifle less than \$1,000,000. The weight of the projectile would be 270 tons, and it would have the complete mechanical equipment of a submarine. The tanks which are used in a submarine to govern its buoyancy would serve the same purpose in the aerial projectile, being filled with air, which would be released according to the resistance encountered in the projectile's initial flight of 250 miles. Once hurled beyond the gravity zone of the earth it would encounter no gravitation to displace its weight. A mountain or a giant become of equal weight, moving in ether at the same speed as the molecules that are thrown off from the earth's atmosphere, a speed of seven

miles an hour. The projectile, its hood once closed, would imprison the operating crew and the scientists in an airtight compartment. They would be thenceforth completely shut off from the world. Would it be safe? According to the captain of a submarine there would "no call for nervousness." There would be no defects to fear in the machinery, no rigging to strain, no sails to carry away, no boiler to burst, no fire to break out, no concern about the weather. Its electrical appliances would supply heat, light and propulsive power sufficient to keep it moving through space. A 75 horsepower motor would be sufficient for this purpose. Electric stoves would cook a supply of food as well as any restaurant could provide. A reserve supply of compressed air would be carried in tanks. Every 35 hours the foul air could be exhausted and renewed from the fresh air tanks. In this way there would be room enough in the projectile to store enough compressed air to live 45 days.

There would be no startling sensations after the projectile had made its first dive into space from the muzzle of the lunar cannon, excepting the new sights and surprising observations from the portholes. But the first leap from the lunar cannon! A projectile from a 12 inch rifle shoots into the air at the rate of 20,000 feet a second. It would not be essential to the success of the lunar projectile's flight to exceed the speed of a navy gun, for at that rate the lunar car would penetrate the zone of gravity in less than an hour. A problem of prime importance is the safety of the car's passengers at the moment of the discharge of the lunar gun. In view of the nature and size of the huge instrument the solution is not so difficult as it would seem.

The construction of the lunar gun itself gives it a character unlike any other piece of ordnance in existence. Of such a tremendous size, the gun would necessarily be cast in parts and built in a manner not dissimilar to the sections of great drainage tubes or subway structures. Enormous electrical cranes, such as are used in Panama, could easily shift these sections upon steel scaffolding, where they would be riveted and joined, much as were the segments of the Manhattan bridge over the East river, or the "stories" of the Singer building, which was made a compact structure 400 feet in the air by the electric welding of its component parts. The shell or case of the lunar gun once completed it would be reinforced by enormous

sheets of steel electrically welded, making it at last one solid piece of metal. Around this great tube of 700 feet length would be wound endless miles of wire, thus forming it into a sectional dynamo of vast proportions and of hitherto undreamed of power. The gun itself would rest upon a gigantic carriage of heavy structural steel, so stayed and supported upon concrete caissons that its steadiness and accuracy of fire would be insured. As the wire that surrounds the gun would be perfectly insulated and store the electric force that would "fire" the projectile, each magnetic section connected with the first magnetic section would mark the second when the shot would occur. Thus the men in the projectile, each magnetic section connected with the first magnetic section would mark the second when the shot would occur. Thus the men in the projectile, each magnetic section connected with the first magnetic section would mark the second when the shot would occur.

Scientists who have dwelt upon the thought of erecting a lunar gun and sending a projectile car to the moon have an ideal spot for the construction of such a great enterprise. Let us then imagine the completion of all the mechanism for the project. The vast electrical energy of Niagara falls, or the entire plant of the subway, elevated and surface roads, some 200,000 horsepower, would be turned into the coil of the lunar gun. The projectile car would be hoisted into the breach of the gun, to its place against the inner magazine, and astronomers and scientists from all parts of the world would form a constant board to aim the gun so that its car in a 10 days' flight would land in the vicinity of the moon. Hundreds of thousands of people would be assembled from various parts of the world. What a thrill would be experienced and what a shout would go up when the bells of the city clanged and the whistles of the factories and steamers shrieked at the rocket signal that the current of 100,000,000 voltage had been turned into the magnets of the lunar gun!

The flight of the projectile through the air would be so swift that as first the eyes could not follow it, then as it swam off gracefully through space the eyes of every man, woman and child of the earth would seek to follow it, for through spectatoriums it would be possible to watch the progress of the projectile car. The great telescopes erected upon the highest peaks of the Andes and the Himalayas would follow the course of the projectile as it passed in its speedway through the attenuated, jellylike sea of ether, and all the time the wireless stations at "Space Bay," on the Eiffel tower and at various points of the earth would be giving back the message to man of his triumph over space and perhaps the secret of the universe. If Professor Dodge is to be believed, the daring scientists, upon reaching the surface of the moon, would not go to their doom, but to a new existence, where they could communicate with the earth and perhaps arrange subsequent trips divested of even the dangers they encountered. "Men could abide on the moon for a time," says Professor Dodge. "In thick walled, airtight houses, and could walk out of doors in airtight divers' suits. Scientists would find in the wastes a fresh field for exploration. Astronomers could plant their telescopes there, free from their most serious hindrance, the earth's atmosphere. Tourists of the wealthy and adventurous class would not fail to visit the satellite, and it is probable there are veins of precious metals, beds of diamonds and an abundance of sulphur in a world of so highly volcanic a character." "Let us suppose we arrive on these savage volcanic steppes of the moon about the middle of the day," says the celebrated French astronomer, Camille Flammarion, "from the black horizon shoot rapid arrows of solar light, which strike the summits of the moon mountains, while the plains and valleys remain in darkness. The light increases slowly. While with us in the central latitudes the sun takes but two minutes and a quarter to rise, on the moon it takes nearly an hour, and consequently the light which it sends is very feeble for several minutes and only increases with extreme slowness." "The inhabitants of the lower hemisphere turned toward our earth admire in their sky a brilliant body, having a diameter about four times greater than that of the moon seen from our globe, and with a surface 4 times larger. This body, which is the earth, is the moon of the moon." "It soars almost motionless in the sky. The inhabitants of the center of the visible hemisphere see it almost constantly in their zenith. Its light diminishes with the distance of the country from this central point, up to the limit of this hemisphere, where they see our world placed like an enormous disk on the mountains. Beyond that they see us no more." "The scientists of the moon have probably proved in the most categorical manner to the ignorant who surround them that the earth, not being habitable, should not be inhabited, and that it is made solely to serve as a clock to the moon and to shine during the night." Alluring speculations that must some day, if man ever accomplishes the long dreamed of trip to the moon, be brought into the realm of exact science and not on the pages of astronomical lore!