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# The History of the Rocket Motor

By LESTER D. WOODFORD, '33

THE unconscious forecasts of Jules Verne are fast becoming part of the actual study of science. Travel to the "Heavenly Bodies" will some day in the near future, be as common as the flight of the airplane is today. It is, of course, strange to the custom of the day to think of "dashing off to Mars for the summer," but why not? Is this so impossible, that anyone who seriously contemplates its eventuality must be condemned as a senseless dreamer? Must the same class of people who considered Verne's version of the submarine, and the Wright brother's belief in heavier-than-air craft, still remain totally unconscious of the advance of science? We must learn to accept the creed that is rapidly becoming popular, "Nothing is impossible to science, until it has definitely been proved so."

Since the World War, aviation has achieved new and astonishing speeds. The battle plane of 1918 vintage with its "terrific" speed of 128 miles per hour has given way to the modern 1932 model with an increased speed of over 200 miles per hour. This change seems almost incredible, but the changes within the next fourteen years will be more than incredible to the historian; they will be fantastic. Within a very short length of time, aircraft will be propelled through space at rates of speed of *more than 5,000 miles per hour!*

This change will not, however, be effected by the use of any development of the present day gasoline motor. The reason for this is that this type of power plant will very soon reach the point where further speed will be impossible. John Rathbun, speaking for many of the scientists in the field of aeronautics, states in a recent article in "Aviation," "to reach a speed of 500 miles per hour, it will be necessary to construct a motor that will develop more than 7,500 horse power." With the motor consuming fuel at a rate of 0.5 pounds per horsepower hour, the fuel alone would furnish an extremely difficult factor in construction. In addition to this, the motor, with a reasonable minimum weight per horse power ratio of one, would tip the scales at 7,500 pounds!

In the future, it will therefore be necessary to develop a power plant incorporating some other principle. It must be very light, and at the same time capable of developing enormous horse power. Such a motor must have a weight ratio of less than 2 ounces per horse power.

The new "Rocket Motor" seems to be the answer to this demand. In its compactness, small weight, and terrific horse power, we find possibilities for unheard-of speed which will carry airplanes through space at an extremely modest estimate of 5,000 miles per hour. This speed, with the aid of future scientific research, will double, and even treble, until such a point is reached, that these airplanes will leave the gravitation of the Earth and travel to other worlds. Unbelievable as this may seem, it is the prediction of many of our present-day scientists. They foretell of these "space ships" travelling to Mars, the Moon, Venus, and many other parts of the universe.

Jules Verne, in his book, "From the Earth to the Moon," published in 1866, made a statement, the significance of which is becoming clear even to the skeptical, "Distance is but a relative expression and must end by being reduced to zero." This, we may say, is an elementary principle of interplanetary travel by the use of the rocket motor. No matter what the distance may be, space *will* be conquered! Pioneers in this field may be balked from time to time, by obstacles, but developments are steadily and surely forming toward an actual

*THIS is the first of a series of articles by Mr. Woodford on Rocket Motors. The second article of the series will deal with the design and principles of the rocket motor while the third will describe the present uses of such motors and their possible future applications.*

*Mr. Woodford has been interested in this subject for a number of years and has made a study of the rocket motor. He has conducted a number of experiments with models which he has designed and built. The results of these experiments have aroused a great deal of interest.—The Editor.*

realization.

## History of the Rocket

The path leading to the successful harnessing of the rocket is a long and arduous one, and one that is blocked at every turn by difficulties. The scientists of today, though they are caused some trouble by obstacles, are able, by their tools of modern science to combat and overcome them, one by one.

Strange as it may seem, the rocket has been used by the civilized world for more than a thousand years. The Chinese are said to have used it in their wars against the Tartars, in the 13th Century, by shooting these flaming projectiles into the enemy camp, and igniting their equipment. They were quite effective in this use and helped to bring the Chinese some degree of victory.

From that time until the Napoleonic Wars in the 19th Century, very little was done in the development of the rocket. It was Sir William Congreve, an English ordnance expert, who again tried to tame this fiery giant into a state of submission, and to use it as a war machine. He changed its conventional case of paper to one of iron, worked on a system of combustion chambers and nozzles,

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## History of the Rocket Motor

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and built larger rockets than had ever been known. In 1806 he fired his rockets, filled with jagged pieces of metal and inflammable material, at the French town of Boulogne. These projectiles burst with disastrous force, spreading deadly cargoes in all directions. Although this bombardment was a success, the disadvantage of the rocket as an implement of warfare was clearly demonstrated, for it was almost an impossibility to aim them. With only a small tail-section to regulate their course, it was impossible to predict where they would land, and the army that was using them was often in as much danger as was the enemy. Because of this danger, and the difficulty in keeping them from exploding in their storehouses, the English war department soon discarded them.

The development of the rocket in other fields went forward, however, and during the latter part of the 19th Century various coastal life-saving stations began to use them to carry life lines to sinking ships. The value of the rocket in this field has been only too apparent for thousands of lives have been saved.

The use of the Very Pistol, employing vari-colored rocket cartridges, during the late World War enabled troops to signal other troops, and to keep in touch with their artillery. The use of this pistol also enabled air corps flight commanders to signal his flight, while flying at night.

We have not, as yet, mentioned the most common use of the rocket, the use of the "sky-rocket" on the Fourth of July. Everyone has watched it as it has gone soaring into the sky, trailing sparks and smoke, as some day a much larger one will. This simple type of rocket is not unlike its brothers in principle, and the new rocket motor is merely an improvement upon this principle.

Bell Boy: "Telegram for Mr. Niespondiavinci, Mr. Niespondiavinci!"

Niespondiavinci: "What initial, please?"

\* \* \* \*

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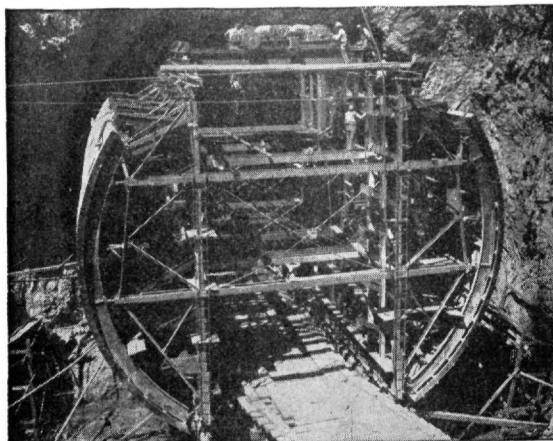
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