

TELEVISION FOR ALL - *New Series by Barton Chapple!*

NEWNES

PRACTICAL MECHANICS

MARCH

6^p



WONDERS
OF THE
UNDERGROUND
RAILWAY

THE MARVELS OF MODERN CANALS - ESCAPING FROM THE EARTH -
"WEIGHING" THE ELECTRON - THE AUTOMATIC PISTOL - MAKING
IGNITION COILS - A SCALE MODEL D.H. GYPSY MOTH - MODEL RAILWAYS -
LATHE WORK - PATENT ADVICE - MONEY-MAKING IDEAS ETC.ETC.



Will it ever be accomplished? The Cold Facts concerning Mankind's Age-old Dream.

THE great amount of success which has attended the recent endeavours of Professor Piccard and others to explore the upper regions of the earth's atmosphere has brought once again into some degree of prominence a problem which seems to be nearly as old as the human race itself.

It is the problem of escaping from the earth, of exploring not only the extreme upper limits of the earth's envelope of air, but also the void of Space beyond and of traversing by some means the distances intervening between the earth and the moon and the various planets of the solar system.

A fascinating problem, indeed. Could it be surmounted, even merely to a limited extent, it would enormously advance the activities of the human race. What, however, are the chances of any member of the human race ever managing to get away from the earth and to voyage safely in outer Space? Are such chances close ones or remote? Or, alternatively, is it an utter impossibility for any man to leave this world behind in the strictly material sense implied in these lines?

Thousands of years ago man tried to imitate the birds and to fly. It was, after all, a more or less natural desire to escape from the tardy means of locomotion which legs alone provide us with. More than 2,000 years ago, according to the old Greek story, a celebrated artist and inventor named Dædalus and his son, Icarus, were both imprisoned in Crete. In endeavouring to escape from the prison they devised wings which they attached to their shoulders by means of wax. Dædalus succeeded in flying across the sea to another land, but Icarus, who evidently was the more adventurous of the two, flew too near the sun, with the result that the heat of that luminary melted the wax which secured his wings in position. He fell into the sea and was drowned, the present-day Icarian Sea being named after this legendary aerial disaster.

Dr. Francis Godwin

In 1638 a Dr. Francis Godwin, of Hereford, devised a scheme for getting away from the earth. So enthusiastic was the

learned doctor over his notion that he wrote a book on the subject and therein he detailed his proposals for the projected space-voyage. Dr. Godwin's idea was to fly to the moon on a frame-like contraption to which were to be harnessed ten wild swans. The voyager sat in, or rather hung on to a small seat from which he drove the swan team and, for steering purposes, he manipulated a small sail which was fixed at the back of the space-chariot. Needless to say, Dr. Godwin's fantastic invention never got beyond the pages of his curious and interesting book.

Another equally mad scheme for flying upwards to the moon was that of Cyrano de Bergerac, who at a later date proposed, by means of certain feathered wings and various magical incantations, to do the

journey in less than twelve hours! There still exist to this day old prints depicting the redoubtable Cyrano stepping off from Mother Earth with great gusto.

Coming to more recent times, nearly every reader of this paper will be aware of the imaginative scheme of that scientific pioneer novelist, Jules Verne, for escaping from the earth and voyaging to the moon. In his "From the Earth to the Moon," published in the later years of the last century, Jules Verne encases his space voyagers in a specially-constructed steel projectile and he shoots them from the face of the earth by means of an enormous cannon. Owing to certain miscalculations the imaginary lunar explorers do not actually land on the surface of our satellite. Instead they glide

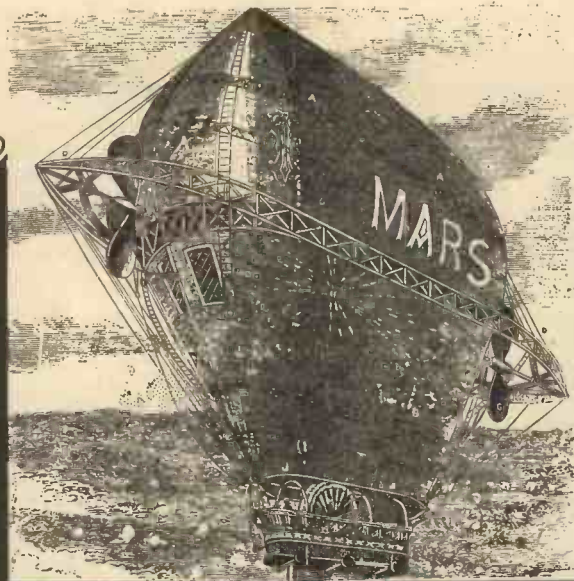
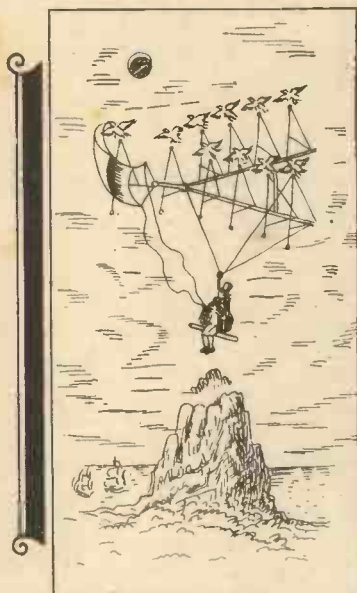
(Right) The moon seen through a powerful telescope. Note the craters and the dark plains or "seas," and (below) a photograph of one of the many vast fire-clouds which are present out in the depths of space. Space voyagers encountering even the—



—nearest fringe of one of these clouds would meet with instant disaster.

past it! at a distance of forty miles, eventually, by an ingenious manoeuvre, returning to the earth and landing in the middle of the ocean. Mr. H. G. Wells, in his "First Men in the Moon," gets his explorers to the moon by means of a gravity-insulating material, whilst certain American romancers have attempted to visualise the construction of enormously long rigid tubes of light metal extending from the earth's surface beyond the utmost limits of the atmosphere and through which some sort of traffic could be propelled by the force of compressed air.

(Below) Dr. Francis Godwin's projected journey to the moon. The sketch shows him seated on a frame-like contraption harnessed to ten swans.



(Below) Cyrano de Bergerac, who proposed by means of certain feathered wings and various magical incantations to journey to the moon in less than twelve hours.



Before the days of dirigibles this airship was projected for the purpose of exploring the upper reaches of the earth's atmosphere. It was to be driven by steam!

up the sides of the projectile so that they would rapidly become incandescent and burn away like a meteor in the sky.

In order, therefore, to overcome this drawback it has, from time to time, been proposed to employ for the journey a projectile which would leave the earth with a much smaller velocity. A specially designed rocket would be used. It would be equipped with a number of separate propelling-charges, each coming into operation successively. The first propelling-charge would shoot the rocket about 200 miles above the earth's surface, the journey occupying about twenty or thirty seconds. A second propelling-charge would then automatically come into operation. After this has been spent a third charge would be ignited automatically, and so on until the rocket-projectile had journeyed beyond the immediate sphere of the earth's attraction.

In order to lessen the force of the rocket's descent upon the moon certain "braking charges" would be brought into action by the lunar navigators—that is to say, if they still remained sufficiently alive to control the rocket's mechanism. By explosively forcing out a stream of gases in front of the rocket as it descended upon the moon's surface it is supposed that the excessive and inevitably destructive landing-velocity of the projectile could be counteracted.

"All nonsense," you say. And, indeed, you are right. There has been more nonsense talked and written about escaping from the earth than there has been on any other scientific or pseudo-scientific subject in modern times.

The popular scheme nowadays for escaping from the earth is by means of a specially constructed rocket. And, naturally enough, the moon, being our nearest neighbour in the heavens, is usually the destination of the proposed journey.

Let us see, however, how such schemes fare when they are calmly examined in the light of modern scientific knowledge.

Escaping from Gravitational Influence

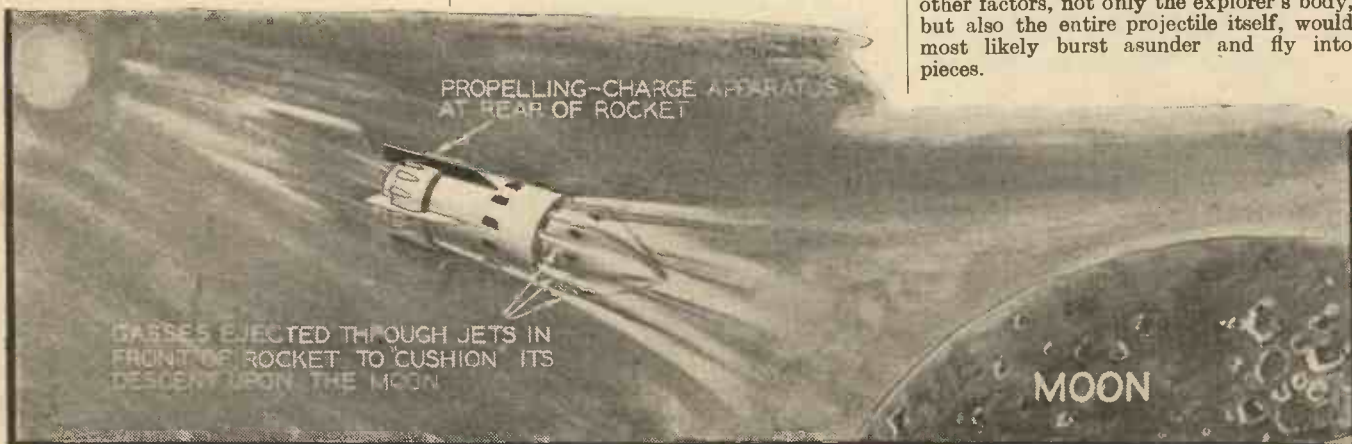
In the first place, for a body to escape from the earth's gravitational influence it must leave the earth with a speed of at least seven miles per second. That is, of course, assuming that there were no atmosphere to impede the progress of the rocket or whatever other projectiles were employed for the journey. As, however, the earth possesses a fairly dense atmosphere, the space-projectile must leave the earth at a much greater speed than the above.

At such required speeds, however, friction with the atmosphere would quickly heat

There are a thousand and one difficulties connected with schemes such as the above. But even supposing that in course of time such difficulties were all surmounted and that a space-worthy projectile became an accomplished fact, we are utterly without knowledge as to how the human system would react to the conditions of the voyage. In the opinion of many scientists the human organism, accustomed as it has been for so many thousands of years to living at the bottom of a deep ocean of air, would become totally disorganised before the voyage to the moon was even one-third completed—if, indeed, the human frame proved itself capable of withstanding without injury the initial shock of the rocket's propelling-charge.

Deep-sea fishes, when they are brought up from the depths of the ocean, literally burst into pieces owing to the much reduced pressure which is exerted upon their bodies. So, also, in the opinion of many people whose judgment is to be relied upon, would it be with the would-be space-explorer seated within the control-room of a hermetically-sealed space-projectile.

Due to disturbances of gravity, the enormous lowering of pressure outside the region of the earth's atmosphere and various other factors, not only the explorer's body, but also the entire projectile itself, would most likely burst asunder and fly into pieces.



Steering the Space Projectile

Let us suppose, however—for one should never deem anything to be totally impossible—that the ghastly possibility previously outlined could be eliminated with certainty and that a trip outwards into Space could be undertaken with, at least, a fair chance of success. How now, could the space-projectile be steered so that it would land accurately upon the moon or upon the surface of some other heavenly body and not fly past it into the depths of unknown and, perhaps, unfathomable Space?

The usual answer to this vitally important question is to the effect that the precise "landing-direction" would be given to the projectile by "calculation." Meaning, one supposes, that a troop of mathematicians and an army of physicists would work out the necessary elevation and line of direction of the rocket, and also the exact time of its journey's commencement in order that it could hit the moon accurately and at any required area.

Such a mathematical feat might not be impossible in actual practice. It would certainly be an extremely difficult task, however. For one thing the motions of the earth and the moon are not constant. They are both subject to a good deal of unexplained irregularities. Then again, rockets are notoriously unreliable so far as their speed and direction of travel are concerned. And when, to this, is added the fact that the rocket-projectile would be subjected to unknown influences during its journey through Space, the chances of a

rocket falling upon the moon's surface, even when fired under the most careful and accurate mathematical supervision, would be remote. The chances of an earth-fired rocket reaching the surface of a neighbouring planet such as Mars or Venus are pretty well infinitesimal. The successful Space-traveller of the future, if he materialises at all, will therefore have to devise and rely upon his own steering arrangements and not leave that important task to the earth-bound mathematicians and physicists.

The Return Journey

Last, but not least, in our brief review of the enormously difficult problems which are associated with the various proposals for escaping from the earth, is the highly important one of returning safely to the home planet. Curiously enough, this problem—perhaps the greatest of all the multitudinous difficulties connected with Space-voyaging—is usually relegated to a position of merely secondary importance by the pseudo-scientific visionaries who propose their daring schemes of Space exploration. Having reached the moon, for instance, by one means or another, how are the lunar travellers to return to the earth?

On the moon's surface there is no air, no water, no food, no ordinary sources of energy, no projectile-firing appliances, no planetary observatories, no calculating mathematicians. Truly, therefore, it would appear that the adventurous Space-voyager, having by some extraordinary

means reached the surface of the moon unharmed, would have to remain on that satellite for the remainder of his days—which, considering the complete absence of food, water and oxygen, would not be likely to be very numerous.

The truth about the matter of Space-journeying is a very simple and straightforward one. Modern science, with all its marvellous powerful and far-flung resources, is utterly unable at the present time to devise any means of flinging a projectile, a mass of rock, a small stone or even a single atom into the unknown void of Space which exists beyond the boundaries of the earth's atmosphere. The very best which modern science can do is to cause a shell or rocket to traverse in an obliquely-upwards direction a few miles of the earth's atmosphere. How, therefore, whilst the relatively simple and preliminary feat of hurling away from the earth a few pounds of inanimate matter remains totally unaccomplished, can human beings, with their finely adjusted and delicately poised internal and sensory mechanisms, hope to escape successfully and unharmed from the earth and also to return to it again?

Mankind has ever cried for the moon. Taking all things into consideration, however, it is not very likely, unless at some future period an enormous expansion of human knowledge and human capabilities occurs, that either Man or his corpse will ever be found beyond the confines of old Mother Earth.

The Indian Rope Trick.

TO most people the Indian rope trick is considered a myth, one explanation being that it is carried out by means of mass hypnotism, during which the audience imagine they see a youth climb up a rope which apparently stands up on end. Others suggest that it is performed with a specially prepared rope, but it is difficult to decide whether either explanation is correct. The pictures on this page show the trick actually being performed at Devonport, and the photographer who examined the rope used for the trick is certain that it was genuine.



The Indian rope trick being performed on Roborough Down, Devonport.

IN THE NEWS

If any readers think they have a suitable solution to this trick, write to the Editor, their explanation being given in not more than 200 words.

The Leipzig Spring Fair, 1935

THE Leipzig Spring Fair, 1935, will be held from Sunday, March 3rd, till Sunday, March 10th. The Samples Fair closes Saturday, March 9th, noon, whilst the Great Engineering and Building Fair will be open till March 10th, evening. The Textile Fair closes on the evening of March 6th; the Fair for Office Requisites in the "Jaegerhof," the State Furniture Fair and the Fair for Sports Goods will be open until the evening of March 7th. The "Bugra" (Book Trades) Machine Fair closes March 9th, noon. The special Fair of the Optical, Photographic and Cinema Industries, hitherto housed in the "Turnhalle" (gymnasium) at the Frankfurter Tor, will in future take place within the Great Engineering and Building Fair on the Exhibition Grounds in Hall 12. The Special Fair of the Optical, Photographic and Cinema Industries will therefore last from March 3rd until the evening of March 10th.

Pistol-fired Rocket Trials

TRIALS have recently been carried out with a new type of life-line rocket. It is a pistol which fires a miniature rocket with a life-line, on the same principle as the rockets fired by the Board of Trade life-saving apparatus. It is reported that in a recent trial at Brixham the pistol-fired rocket carried the life-line a far greater distance than the ri e usually employed.

A Mammoth Crane

WHAT is claimed to be the largest Titan crane in the United Kingdom has just been erected at Billingham by Sir William Arrol & Co. It is designed to handle a load of 170 tons.

Beacons in India

A VAST scheme for the improvement of aviation in India has recently been put in hand, one feature being the erection of beacons every hundred miles along a 3,000-mile route from Karachi, in Sind, to Victoria Point, in Burma.



Showing a youth climbing the rigid rope.