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### The Mysterious Universe

Originating from the Rede Lecture delivered at the University of Cambridge in November 1930, this book is based upon the conviction that the teachings and findings of astronomy and physical science are destined to produce an immense change on our outlook on the universe as a whole, and on views about the significance of human life. The author contends that the questions at issue are ultimately one for philosophical discussion, but that before philosophers can speak, science should present ascertained facts and provisional hypotheses. The book is therefore written with these thoughts in mind while broadly presenting the fundamental physical ideas and findings relevant for a wider philosophical inquiry.

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# The Mysterious Universe

JAMES JEANS



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## PLATE I. THE DEPTHS OF SPACE



*A Cluster of Nebulae in Coma Berenices.* This is a photograph of a minute piece of the sky, taken with the largest telescope in existence (Mount Wilson, 100-inch). The majority of objects are nebulae, at a distance such that their light takes 50 million years to reach us. Each nebula contains some thousands of millions of stars, or the material for their formation. About two million such nebulae can be photographed in all, and there are probably millions of millions of others beyond the range of any telescope (see p. 57)

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THE  
MYSTERIOUS  
UNIVERSE

by  
**SIR JAMES JEANS**  
**O.M., F.R.S.**

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*And now, I said, let me show in a figure how far our nature is enlightened or unenlightened:—Behold! human beings living in an underground cave, which has a mouth open towards the light and reaching all along the cave; here they have been from their childhood, and have their legs and necks chained so that they cannot move, and can only see before them, being prevented by the chains from turning round their heads. Above and behind them a fire is blazing at a distance, and between the fire and the prisoners there is a raised way; and you will see, if you look, a low wall built along the way, like the screen which marionette players have in front of them, over which they show the puppets.*

*I see.*

*And do you see, I said, men passing along the wall carrying all sorts of vessels, and statues and figures of animals made of wood and stone and various materials, which appear over the wall?...*

*You have shown me a strange image, and they are strange prisoners.*

*Like ourselves, I replied; and they see only their own shadows, or the other shadows which the fire throws on the opposite wall of the cave?*

*True, he said; how could they see anything but the shadows if they were never allowed to move their heads?*

*And of the objects which are being carried in like manner they would only see the shadows?*

*Yes, he said.*

*To them, I said, the truth would be literally nothing but the shadows of the images.*

PLATO, *Republic*, Book VII

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## FOREWORD

The present book contains an expansion of the Rede Lecture delivered before the University of Cambridge in November 1930.

There is a widespread conviction that the new teachings of astronomy and physical science are destined to produce an immense change on our outlook on the universe as a whole, and on our views as to the significance of human life. The question at issue is ultimately one for philosophic discussion, but before the philosophers have a right to speak, science ought first to be asked to tell all she can as to ascertained facts and provisional hypotheses. Then, and then only, may discussion legitimately pass into the realms of philosophy.

With some such thoughts as these in my mind, I wrote the present book, obsessed by frequent doubts as to whether I could justify an addition to the great amount which has already been written on the subject. I can claim no special qualifications beyond the proverbially advantageous position of the mere onlooker; I am not a philosopher either by training or inclination, and for many years my scientific work has lain outside the arena of contending physical theories.

The first four chapters, which form the main part of the book, contain brief discussions, on very broad lines, of such scientific questions as seem to me to be of interest, and to provide useful material, for the discussion of the ultimate philosophical problem. As far as possible I have avoided overlapping my former book, *The Universe Around Us*,

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## FOREWORD

because I hope the present book may be read as a sequel to that. But an exception has been made in favour of material which is essential to the main argument, so as to make the present book complete in itself.

The last chapter stands on a different level. Every one may claim the right to draw his own conclusions from the facts presented by modern science. This chapter merely contains the interpretations which I, a stranger in the realms of philosophical thought, feel inclined to place on the scientific facts and hypotheses discussed in the main part of the book. Many will disagree with it—it was written to this end.

J. H. JEANS

DORKING, 1930

In preparing a second edition, I have tried to bring the scientific matter of the first four chapters up to date, and to remove all ambiguities from my argument. I found with regret that certain passages in the original book were liable to be misunderstood, misinterpreted, and even misquoted, in various unexpected ways. Some of these passages have been expunged, some rewritten and some amplified. Here and there new paragraphs, occasionally even whole pages, have been added in the hope of making the argument clearer.

J. H. JEANS

DORKING,  
*July 1st, 1931*