

**THE ILLUSTRATED
LONDON ASTRONOMY
FOR THE USE OF
SCHOOLS AND STUDENTS**

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The Illustrated London Astronomy for the Use of Schools and Students by John Russell Hind

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JOHN RUSSELL HIND

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THE ILLUSTRATED
LONDON
ASTRONOMY,

FOR THE

Use of Schools and Students.

BY

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OF MR. BISHOP'S OBSERVATORY, REGENT'S PARK.

WITH

NUMEROUS ILLUSTRATIVE DRAWINGS AND DIAGRAMS.

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PREFACE.

THE study of Astronomy by young persons cannot be too highly commended ; it expands the mind, raising it from the ordinary affairs of earth to the contemplation of the works of the Creator upon the grandest scale that man can behold them. In the heavens we every where witness the most astounding proofs of Almighty power and design ; and if feelings of pride are induced by the advances which human thought and application have made in unfathoming the mysteries of the universe, those feelings must give way to others of a contrary character—of humility—when we reflect how small, how insignificant, a place is occupied by the earth on which we dwell, vast as it appears to us, amongst the infinity of worlds scattered through the firmament. Such should be the invariable result of a study of the sublime facts of Astronomy.

Thousands of years have rolled away since the Chaldean shepherds watched the stars while guarding their flocks by night—and yet how small our knowledge of them in the nineteenth century, compared with what there is to learn ! Aided by the telescope, rapid advances have truly been made within the last three hundred years ; but there is work for ages to come, ere man will rest content. “That which we know is little,” exclaimed Laplace ; “but that which we know not is immense.”

In preparing the present work, which is specially intended for beginners, the author has endeavoured to give the most information in the fewest words, consistent with a clear understanding of the subject under

treatment; to offer the most simple explanations of astronomical principles and phenomena; and, as far as practicable within the limits of the work, a description of the various heavenly bodies, according to the actual state of our knowledge respecting them. Without professing to have followed any particular plan of arrangement of his subjects, the author trusts they will be found to be introduced in such order, that the learner will experience no difficulty in comprehending them as he goes on.

It is intended that the *sense* rather than the words of the text should be expected by the teacher from the pupil.

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THE

ILLUSTRATED LONDON ASTRONOMY.

INTRODUCTION.

ASTRONOMY is that branch of natural science which treats of the heavenly bodies, describing their apparent and real magnitudes, distances, and motions, and the laws by which they are governed. The wonderful facts it reveals to us respecting the mechanism of the heavens, the grandeur and illimitable extent of the starry universe, and the beautiful harmony and regularity which prevail in the varied phenomena of the skies, have well entitled it to be called "the sublime science."

The determination of the apparent and real magnitudes and distances of the heavenly bodies, their orbits or paths in space, and every thing relating to description or observation, form what is called *Plane or Practical Astronomy*; the latter term is sometimes more especially applied to the management of astronomical instruments, and the explanation of the processes of calculation which attend their use.

The investigation of the *causes* operating in the motions and phenomena of celestial bodies constitutes *Theoretical or Physical Astronomy*; an abstruse and difficult study, which involves mathematical reasoning of the highest order, and is consequently suited only to the comprehension of the few.

In the present treatise we have to explain the principles of *Plane Astronomy*, and to place before the learner an outline of the most remarkable discoveries of ancient and modern times in this interesting science.

APPARENT MOTIONS OF THE STARS.

Suppose a person to have taken his station somewhere in this country soon after dusk on a clear winter evening, where his view of the heavens is uninterrupted by terrestrial objects.

The circle which limits his view on all sides is the *sensible horizon*; and an imaginary line passing through the north and south points of the horizon and the point immediately over his head (termed the *zenith*) is the *meridian* of the place.