ELEMENTS OF ASTRONOMY

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Elements of Astronomy by Simon Newcomb

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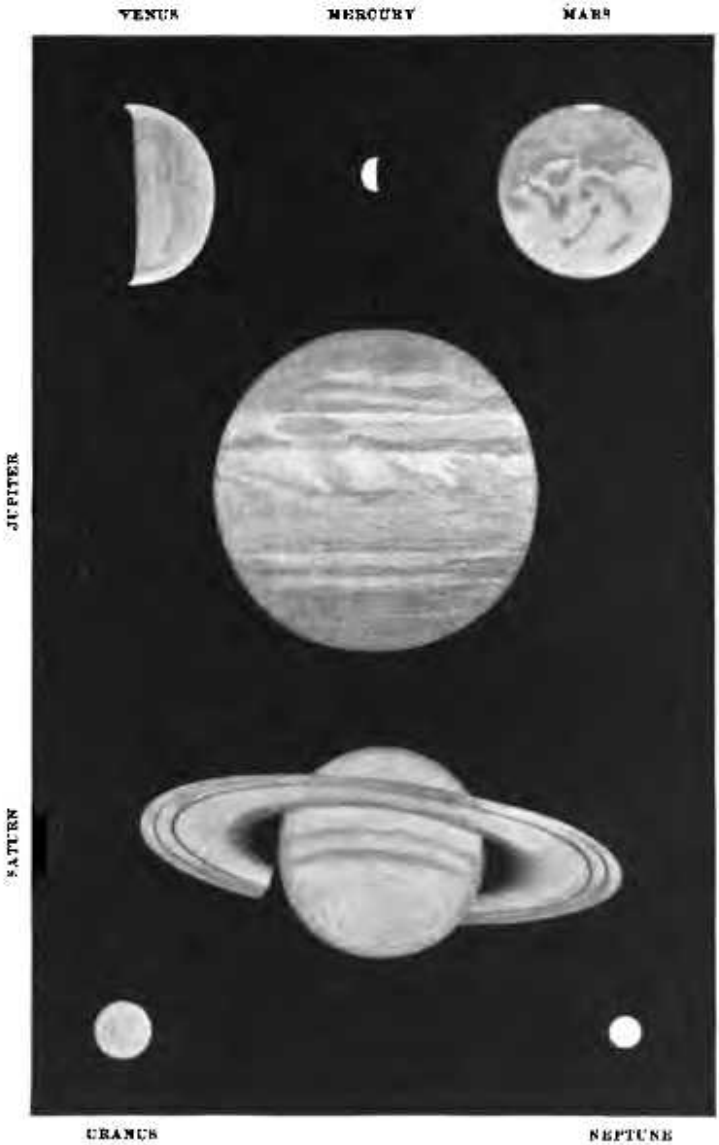

Frontispiece TELESCOPIC VIEWS OF THE PLANETS.

ELEMENTS OF ASTRONOMY

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PREFACE

Two objects have been kept in view in preparing this little book. One was to condense those facts and laws of the science which are of most interest and importance to the general intelligent public within so small a compass as not to make a very serious addition to the curriculum of the high school or college. The other was so to present the subject that as little formal mathematics as possible should be necessary to its mastery.

Of the first object little need be said. The typical person constantly kept in mind has been the inquiring layman seeking to know something of the heavenly bodies and their relation to the earth, including such subjects of human interest as the changing seasons, the measure of time, and the varying aspects of the planets.

The second object involves more serious questions. Can an idea of the laws and phenomena of the celestial motions be conveyed to a pupil who has not completed the regular course in geometry and physics? The author believes that it can. It cannot, indeed, be denied that the professional astronomer, engineer, surveyor, and navigator who are to make astronomical observations and computations must have a fairly complete training in at least the elementary branches of mathematics. But this training is not essential to him who desires only a command of general ideas, without proposing to make technical applications of the science. What is really essential are those conceptions of motion and form which one may derive from everyday observation, and the understanding of a few elementary definitions in geometry and physics. Our modern system

of education wisely endeavors to implant such conceptions and to teach the corresponding definitions at an earlier age than that when the growing youth is expected to commence a course of formal mathematics.

The author hopes that the early chapters are the only ones that will offer any difficulty to an intelligent pupil prepared for a high school course. Here it is believed that every difficulty may be overcome by two very simple measures on the part of the teacher. One is to point out, approximately, the actual position of the celestial poles and equator and the apparent diurnal courses of the sun and stars, as they might be seen in the mind's eye from the schoolroom or the field. The object of this is that the learner may conceive the phenomena he is studying as if seen in the sky. The other is to see that the learner correctly apprehends the meaning of the figures representing points, circles, and motions on the celestial sphere; especially, that he always imagines himself looking at the objects represented as if he were at the center of the sphere.

For this last suggestion and for other valuable hints, the author takes much pleasure in acknowledging his indebtedness to Mr. Edward P. Jackson, teacher of Physics in the Boston Latin School.

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