

**THE ELEMENTS OF THE FOUR
INNER PLANETS AND THE
FUNDAMENTAL CONSTANTS
OF ASTRONOMY**

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The elements of the four inner planets and the fundamental constants of astronomy by Simon Newcomb

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SIMON NEWCOMB

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PREFACE.

THE diversity in the adopted values of the elements and constants of astronomy is productive of inconvenience to all who are engaged in investigations based upon these quantities, and injurious to the precision and symmetry of much of our astronomical work. If any cases exist in which uniform and consistent values of all these quantities are embodied in an extended series of astronomical results, whether in the form of ephemerides or results of observations, they are the exception rather than the rule. The longer this diversity continues the greater the difficulties which astronomers of the future will meet in utilizing the work of our time.

On taking charge of the work of preparing the *American Ephemeris* in 1877 the writer was so strongly impressed with the inconvenience arising from this source that he deemed it advisable to devote all the force which he could spare to the work of deriving improved values of the fundamental elements and embodying them in new tables of the celestial motions. It was expected that the work could all be done in ten years. But a number of circumstances, not necessary to describe at present, prevented the fulfillment of this hope. Only now is the work complete so far as regards the fundamental constants and the elements of the planets from Mercury to Jupiter inclusive. The construction of tables of the four inner planets is now in progress, those of Jupiter and Saturn having already been completed by Mr. HILL. All these tables will be published as soon as possible, and the investigations on which they are based are intended, so far as it is practicable to condense them, to appear in subsequent volumes of the *Astronomical Papers of the American Ephemeris*. As it will take several years to bring out these volumes, it has been deemed advisable to publish in advance the present brief summary of the work.

The author feels that critical examination of this monograph may show in many points a want of consistency and continuity. The ground covered is so extensive, the material so diverse as well as voluminous, and the relations to be investigated so numerous, that no conclusion could be reached on one point which was not liable to be modified by subsequent decisions upon other points. The author trusts that the difficulties growing out of these features of the work, as well as those incident to the administration of an office not especially organized for the work, will afford a sufficient apology for any defects that may be noticed.

NAUTICAL ALMANAC OFFICE,

U. S. Naval Observatory, January 7, 1895.

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