

Biographical Encyclopedia of Astronomers

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Andoyer, Marie-Henri

Born Paris, France, 1 October 1862

Died Paris, France, 12 June 1929

Henri Andoyer contributed to three principal areas of scientific research: (1) observational and practical astronomy, (2) mathematical astronomy and celestial mechanics, and (3) textbooks and historical accounts. Andoyer's father was bureau chief at the Banque de France. The young Andoyer completed his secondary studies at the Lycée d'Harcourt. Later, he was admitted to the École Normale Supérieure and graduated at the top of his class in 1884, with a degree in mathematical sciences. That year, Benjamin Baillaud, director of the Toulouse Observatory, hired Andoyer as *astronome adjoint* and *chargé de conférences* at the Faculté des sciences at Toulouse

Andoyer completed graduate coursework at the University of Paris and was awarded a doctorate in mathematical sciences in 1886. His dissertation (published the following year) was entitled, *Contribution à la théorie des orbites intermédiaires* (Contribution to the theory of intermediate orbits). In 1887, he was named *aide-astronome* and *maître de conférences* at Toulouse. Two years later, Andoyer married Mademoiselle Périssé, with whom he had three children: two sons and one daughter. One of his sons was killed during World War I

In 1892, Andoyer accepted the post of *maître de conférences* in celestial mechanics at the Faculté des sciences in Paris. Soon, he was named assistant professor, and in 1903, professor of astronomy. Upon the death of Jules Poincaré in 1912, Andoyer occupied the chair of general astronomy and celestial mechanics. Until 1905, he remained a member of the examination committee for mathematical sciences.

While at Toulouse Observatory, Andoyer was given charge of the new service of the Carte du Ciel in 1889. There, he became a pioneering figure in that vast international scientific enterprise. Before his departure for Paris, he devoted a large part of his time

to the organization of celestial photography. Concurrently, Andoyer made observations of Jupiter's satellites, meridian observations of the Moon, and observed minor planets, comets, and double stars. After the discovery of the minor planet (246) Asporina in 1885, he calculated its orbital elements and projected an ephemeris for its opposition in 1885 and that of 1886.

Andoyer's studies in celestial mechanics were first carried out along the lines of Hugo Gylden. One of the important classes of phenomena that Andoyer examined was that of near-commensurabilities or resonances. He studied the orbits of minor planets in which the mean motion was sensibly double that of Jupiter, e.g., asteroid (108) Hecuba. Andoyer's work contributed to further explanation and acceptance of the gravitational explanation offered for the Kirkwood gaps in the asteroid belt, first enunciated by American astronomer Daniel Kirkwood. It was to this discipline that Andoyer was particularly devoted, as evidenced by his numerous memoirs on the subject. He proposed general methods of integration for solving problems in celestial mechanics and therefore extended the theorems of Siméon Poisson, relative to the invariability of the semimajor axes of planetary orbits

Andoyer's most important research concerned the theory of the Moon's orbit. He determined the intermediate orbit of the Moon and, more specifically, the secular inequalities of the

movements of its nodes and perigee. His comparison of various theories of the Moon allowed him to uncover differences between the results of Charles Delaunay and those of Philippe le Doulcet de Pontécoulant. Reporting the errors incumbent on the former, he concluded that "all the complementary terms calculated by Delaunay beyond the seventh order are inexact; on the other hand, the earlier terms of the orders below the eighth are in general exact." Andoyer examined the n -body problem, expanding upon the results of Joseph Lagrange concerning the equilibrium solutions for three bodies

Andoyer's fundamental works are represented in the two-volume outline he prepared for his *Cours d'Astronomie de la Faculté des Sciences*: I - Theoretical Astronomy (1906), and II - Stellar Astronomy (1909), along with his two-part *Cours de Mécanique céleste* (1923 and 1926). Andoyer produced several textbooks on mathematical analysis and a three-volume work on trigonometric tables. He also published a scientific biography of Pierre de Laplace

A member of the Paris Académie des sciences in 1919, Andoyer was also made president in 1909 of the Commission of Ephemeris of the Permanent International Council for the execution of the photographic *Carte du Ciel*. A member of the Bureau des longitudes in 1910, he was appointed editor (1911) of the *Connaissance des Temps*, the French nautical almanac. Andoyer was named an Officer of the Legion of Honour.

Jérôme Lamy

Translated by: Theresa Marché

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