Andoyer, Henri | Encyclopedia.com

(*b*. Paris France, I October 1862; *d*. Paris, 12 June 1929)

astronomy, mathematics.

Andoyer taught astronomy at the Sorbonne for thirty-seven years. His research dealt with celestial mechanics: perturbation theory, special cases of the three-body and of the *n*-body problem, and the motions of the moon. He developed special methods for use in computing ephemerides, the most elaborate one—for the moon—approximating E.W. Brown's definitive treatment but at a fraction of the labor.

Andoyer's interest in manipulating numbers began very early; his father's work as chief clerk at the Banque de France may have influenced him. He graduated at the top of his class in mathematical science at the École Normale Supérieure in 1884 and wrote his doctoral thesis (1887) on the theory of intermediate orbits as applied to the moon.

His first job took him to Toulouse, where besides continuing his theoretical studies he worked at the telescope, preparing a photographic map of the sky. In "Formules générales de la méchanique céleste" he showed how to solve the general equations of motion to any desired degree of accuracy in terms of trigonometric functions alone.

In 1892 Andoyer returned to Paris, where he began as a *maître de conférence* at the Sorbonne and became a full professor in 1903. Here he worked on special cases of the three-body problem, showing, for example, how to use the Lagrangian libration points (null points in a two-body gravitational field where a third body, of negligible mass, can remain more or less indefinitely) to make the periodic terms of the solution independent of time.

Next he attacked the problem of asteroids that, like Hecuba, move almost exactly twice as fast as Jupiter and hence are strongly perturbed. There followed an analysis of *n* bodies close to equilibrium points, which has been applied to problems of the general stability of the solar system.

In 1910 Andoyer became a member of the Bureau des Longitudes, where he succeeded to the editorship of *Connaissance des temps*, the French nautical almanac. During World War I, with most of the staff mobilized, he prepared many of the ephemerides himself. His *Nouvelles tables trigonométriques fondamentales*, prepared as an aid to computers, have values to fifteen decimal places. He must indeed have been, in the words of one of his students, *un calculateur formidable*.

In 1919 Andoyer became a member of the Académie des Sciences.

BIBLIOGRAPHY

I. Original Works. Andoyer's doctoral thesis, "Contributions à la théorie des orbites intermédiares," appeared in *Annales de la Faculté des Sciences de Toulouse*, **1** (1887), M.I-M.72. Other papers include "Sur les formules générales de la Méchanique céleste," *ibid*., **4** (1890), K.1-K.35; "Sur le calcul des équations de perturbations," in *Bulletin astronomique* (Paris), **19** (1902), 49–61; "Contribution à la théorie des petites planètes dont le moyen mouvement est sensiblement double de celui de Jupiter," *ibid*., **20** (1903), 321–356; and "Sur les solutions périodiques voisines des positions d'équilibers relatif, dans le problème des *n* corps," *ibid*., **23** (1906), 129–146.

The *Nouvelles tables trigonométriques fondamentales* was published in three volumes (Paris, 1915–1918). His lunar theory, a revision of Charles Delaunay's earlier work, appeared in four installments under the general title "Sur la théorie analytique du mouvement de la lune," in *Mémories de l'Académie des Sciences*, 2nd series, **58** , no. 1 (1926), 1–30; **58** , no. 2 (1926), 1–69; **59** , no.1 (1928), 1–98; and **59** , no. 3 (1928), 1–59.

Andoyer's lectures at the Sorbonne resulted in eight textbooks; four on methematics, published in Paris from 1894 to 1898—*Cours de géométrie, Cours d'arithmétique, Cours d'algèbre, and Leçons élémentaires sur la théorie des formes et applications géoméntriques*; and four on astronomy—*Cours d'astronomie, Part I* (Paris, 1906; 3rd ed., 1923) and *Part II*, written with A. Lambert (Paris, 1907; 2nd ed., 1924), and *Cours de méchanique céleste, Part I* (Paris, 1923) and *Part II* (Paris, 1926).

II. Secondary Litrature. An obituary, with a portrait and a list of sixty-seven publications, appeared in *Bulletin astronomique* (paris). 2nd series, **6** (1930). 129–145; two shorter memorials, with anecdotes, are in *Journal des observateurs* (Marseilles), **12** (15 November 1929), 193–198, and **13** (April 1930), 61–64.

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