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## **Finding Aid for the Harry Bateman Papers 1906-1947**

Processed by Carolyn K. Harding.

Caltech Archives

Archives

California Institute of Technology

1200 East California Blvd.

Mail Code 015A-74

Pasadena, CA 91125

Phone: (626) 395-2704

Fax: (626) 793-8756

Email: [archives@caltech.edu](mailto:archives@caltech.edu)

URL: <http://archives.caltech.edu/>

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## **Descriptive Summary**

**Title:** Harry Bateman Papers,

**Date (inclusive):** 1906-1947

**Collection number:** 10018-MS

**Creator:** Bateman, Harry 1882-1946

**Extent:** 3.5 linear feet

**Repository:** California Institute of Technology, Caltech Archives  
Pasadena, California 91125

**Abstract:** Harry Bateman was a mathematical physicist and professor of physics, mathematics and aeronautics at the California Institute of Technology (Caltech, originally Throop College), 1917-1946. The collection includes his manuscripts on binomial coefficients, notes on integrals and related material (much of which was later published by Arthur Erdélyi); and a small amount of personal correspondence. Also included are teaching materials and reprints.

**Physical location:** Archives, California Institute of Technology.

**Language of Material:**

**Languages represented in the collection:**

EnglishFrenchGerman

### **Access**

The collection is open for research. Researchers must apply in writing for access.

### **Publication Rights**

Copyright may not have been assigned to the California Institute of Technology Archives. All requests for permission to publish or quote from manuscripts must be submitted in writing to the Caltech Archivist. Permission for publication is given on behalf of the California Institute of Technology Archives as the owner of the physical items and, unless explicitly stated otherwise, is not intended to include or imply permission of the copyright holder, which must also be obtained by the reader.

### **Preferred Citation**

[Identification of item], Harry Bateman Papers, 10018-MS, Caltech Archives, California Institute of Technology.

### **Acquisition Information**

The collection known as the Harry Bateman Papers was acquired in several installments. The single correspondence file (Box 1.1) was deposited in the Caltech Archives in June 1971 by the Department of Mathematics. The files in Box 1.2-1.10 were deposited sometime shortly afterwards, circa 1972/1973. Materials in Box 1.11 through Box 4 were the gift of Caltech mathematics professor W. A. Luxembourg in August 1977. Prof. Luxembourg received the List of Papers filed in Box 1.11 from the mathematician Arthur Erdélyi, who was the editor of Bateman's posthumous papers (see Biographical Note). In August 1994 the lecture notes taken by Edmund J. Pinney (Caltech PhD 1942, professor of mathematics at Berkeley, 1946-1988) during coursework under Bateman were added to the collection, with the assistance of Prof. Joseph Zund of the Mathematics Department, New Mexico State University, Las Cruces. A set of Bateman's reprints was added to the collection in January 2001.

### **Processing History**

Processed by Carolyn K. Harding, 1977. Updated December 2006.

Original processing of Boxes 1-4 by Carolyn K. Harding, September 1977. Processing updated and revised December 2006, Caltech Archives staff.

### **Biography**

Harry Bateman was born May 29, 1882, in Manchester, England. He attended Trinity College, Cambridge, where he earned his B.A. in mathematics as Senior Wrangler in 1903 and his M.A. in 1906. After a further year of study in Paris and in Göttingen and some teaching at Liverpool University, he came to the U.S. in 1911 to teach at Bryn Mawr College. From Bryn Mawr he went to Johns Hopkins University in Baltimore on a fellowship, and he earned his PhD there in physics in 1913. In 1917 he moved to Pasadena, California, to take a professorial position at Throop College, which would shortly become the California Institute of Technology (1920). He held his appointment there in mathematics, physics, and aeronautics until his death on January 21, 1946.

Bateman displayed a wide range of mathematical interests, from geometry to integral equations. He was the author of many papers; his studies included the application of integral equation theory to the propagation of earthquake waves, the mathematical study of electrodynamics, hydrodynamics, dynamics and elasticity, and the problem of numerical

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computation. Perhaps his best work centered around the development of the properties of special functions and the solution of the most important equations of mathematical physics. His work in fluid mechanics was a basic factor in airplane design. Bateman was recognized by a number of professional societies and organizations, including the Royal Society of London (fellow, 1928), the National Academy of Sciences (fellow, 1930), and the American Mathematical Society (vice-president 1935; Gibbs Lecturer 1943).

At his death, Bateman left extensive notes for a monumental work on special functions. Recognizing the great need for the completion of this important work, Caltech secured funding from the U.S. Office of Naval Research. The Hungarian-born mathematician Arthur Erdélyi (1908-1977), then professor at the Mathematical Institute at the University of Edinburgh, was persuaded to come to Caltech and to accept the task of editing these papers, which he accomplished with three assistants, beginning in 1949 and concluding with the publication of *Higher Transcendental Functions* (McGraw-Hill, 1953-55, 3 vols) and *Tables of Integral Transforms* (McGraw-Hill, 1954, 2 vols). Erdélyi also held a professorial position in mathematics at Caltech until 1963, when he returned to Edinburgh.

#### **Scope and Content**

The Harry Bateman Papers is an incomplete collection at best. Its order follows the sequence of its several acquisition phases, and no attempt has been made to create a series arrangement. The surviving correspondence is only minimally representative of Bateman's scientific contacts. It occupies Box 1, file 1 only. The majority of Bateman's letters were reported to have been discarded by the mathematician Arthur Erdélyi, who otherwise preserved and edited Bateman's mathematical legacy for the Bateman Manuscript Project (see below and Biographical Note). The correspondence files were turned over to the Caltech Archives in June 1971 by Caltech's Department of Mathematics, along with some other miscellaneous manuscript materials that make up the contents of Box 1, files 2-10. The remainder of Box 1 and Boxes 2-3 contain the notes left behind by Bateman at his death for his monumental work on special functions. This material, under the title Bateman Manuscript Project, was eventually edited and published under the supervision of Arthur Erdélyi. Boxes 4-5, both half boxes, contain miscellaneous Bateman materials delivered by the Department of Mathematics at an unrecorded time. Boxes 6-7 contain lecture notes from six courses given by Bateman at Caltech, 1938-1942, taken by his student Edmund J. Pinney (Caltech PhD, 1942; professor of mathematics, UC Berkeley, 1946-1988). The remaining box contains an incomplete set of Bateman's own reprints, arranged chronologically.

#### **Related Material**

Historical File on Harry Bateman. Historical File on Arthur Erdélyi.

#### **Indexing Terms**

The following terms have been used to index the description of this collection in the library's online public access catalog.

#### **Subjects**

California Institute of Technology

Aeronautics

Mathematical physics

Mathematics

#### **Occupations**

Mathematicians

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Box 1, Folder 1	<b>Correspondence 1906-1947</b> <b>Ball, Rouse 1906</b> <b>Whittaker, E. T. 1907</b> <b>Levi-Civita, Tullio 1920</b> <b>Carson, John R. 1921</b> <b>Lorentz, H. A. 1925</b> <b>Guggenheim, Harry F. 1926</b> <b>Durand, W. F. 1926</b> <b>Bell, E. T. 1927</b> <b>Michelson, A. A. 1931</b> <b>Millikan, R. A. 1932</b> <b>Lomonosov, G. 1932</b> <b>Westgren, A. 1935</b> <b>Sirovich, W. I. 1935</b> <b>White, Percival 1935</b> <b>Naulty, E. F. 1935</b> <b>Rice, S. O. ( See also: The Rice Manuscript, Box 3.5-3.8) 1937-1945</b> <b>Wayland, J. H. 1938, 1943</b> <b>Whittaker, Edmond and Stopford, Sir John to Mrs. Bateman 1946</b>
Box 1, Folder 2	<b>Manuscripts undated</b>
Box 1, Folder 3	<b>Miscellaneous undated</b>
Box 1, Folder 4	<b>Report by C. L. Pekeris with remarks by H. Bateman 1943</b>
Box 1, Folder 5	<b>Royal Society of London 1928</b>
Box 1, Folder 6	<b>Notebook: Sound undated</b>
Box 1, Folder 7	<b>Notebook: Hydromechanics undated</b>
Box 1, Folder 8	<b>Notebook No. 2: The Dynamics of Moving Systems undated</b>
Box 1, Folder 9	<b>Notebook No. 4: Atmospheric, Brownian Movement, Thermodynamics, Geophysics undated</b>
Box 1, Folder 10	<b>Notebook No. 3: Thermodynamics undated</b>
Box 1, Folder 11	<b>"List of Papers" undated</b>
Box 1, Folder 12	<b>Bateman notes: Binomial coefficients [unfinished manuscript] I undated</b>
Box 1, Folder 13	<b>Bateman notes: Binomial coefficients [unfinished manuscript] II undated</b>
Box 1, Folder 14	<b>Bateman notes: Binomial coefficients [unfinished manuscript] III undated</b>
Box 1, Folder 15	<b>Bateman notes: Binomial coefficients [unfinished manuscript] IV undated</b>
Box 1, Folder 16	<b>Bateman notes: Binomial coefficients [unfinished manuscript] V undated</b>
Box 2, Folder 1	<b>Bateman notes: Functional equations (1) undated</b>
Box 2, Folder 2	<b>Bateman notes: Functional equations (2) undated</b>
Box 2, Folder 3	<b>Bateman notes: Generalized stream function and related topics (including some problems in symmetric potentials) undated</b>
Box 2, Folder 4	<b>Bateman notes: A guide to the functions undated</b>
Box 2, Folder 5	<b>Bateman notes: Integrals I undated</b>
Box 2, Folder 6	<b>Bateman notes: Integrals II undated</b>
Box 2, Folder 7	<b>Bateman notes: Integrals III undated</b>
Box 2, Folder 8	<b>Bateman notes: Integrals IV undated</b>
Box 2, Folder 9	<b>Bateman notes: Integrals (General) undated</b>
Box 2, Folder 10	<b>Bateman notes: Integrals (General and Notes) undated</b>
Box 3, Folder 1	<b>Bateman notes: Integrals (Lists) undated</b>
Box 3, Folder 2	<b>Bateman notes: Miscellaneous potential functions undated</b>
Box 3, Folder 3	<b>Bateman notes: Numbered C, f, F, g, S, w, z-pages undated</b>
Box 3, Folder 4	<b>Bateman notes: Recurrence relations and generalized notes undated</b>
Box 3, Folder 5	<b>Bateman notes: The Rice Manuscript I undated</b>
Box 3, Folder 6	<b>Bateman notes: The Rice Manuscript II undated</b>
Box 3, Folder 7	<b>Bateman notes: The Rice Manuscript III undated</b>
Box 3, Folder 8	<b>Bateman notes: The Rice Manuscript IV undated</b>
Box 3, Folder 9	<b>Bateman notes: Symmetric potentials. Material for monograph undated</b>
Box 3, Folder 10	<b>Bateman notes: Symmetric potentials without numbering undated</b>
Box 4, Folder 1	<b>Lantern slides: assorted equipment, unidentified engineering (1) undated</b>

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Box 4, Folder 2	<b>Lantern slides: assorted equipment, unidentified engineering (2) undated</b>
Box 4, Folder 3	<b>Lantern slides: assorted equipment, unidentified engineering (3) undated</b>
Box 4, Folder 4	<b>Lantern slides: assorted equipment, unidentified engineering (4) undated</b>
Box 4, Folder 5	<b>Lantern slides: assorted equipment, unidentified engineering (5) undated</b>
Box 4, Folder 6	<b>Lantern slides: assorted equipment, unidentified engineering (6) undated</b>
Box 4, Folder 7	<b>Lantern slides: assorted equipment, unidentified engineering (7) undated</b>
Box 4, Folder 8	<b>Lantern slides: assorted equipment, unidentified engineering (8) undated</b>
Box 5, Folder 1	<b>Book: De Donder, T. <i>La Gravifique Einsteinienne</i>, inscribed copy 1921</b>
Box 6, Folder 1	<b>Edmund Pinney's Bateman Lecture Notes: Ma 201: <i>Modern Analysis</i> III 1938-39</b>
	<b>Note</b>
	Notebooks I and II are missing
Box 6, Folder 2	<b>Edmund Pinney's Bateman Lecture Notes: Ma 201: <i>Modern Analysis</i> IV 1938-1939</b>
Box 6, Folder 3	<b>Edmund Pinney's Bateman Lecture Notes: Ma 201: <i>Modern Analysis</i> V 1938-1939</b>
Box 6, Folder 4	<b>Edmund Pinney's Bateman Lecture Notes: Ma 201: <i>Modern Analysis</i> VI 1938-1939</b>
Box 6, Folder 5	<b>Edmund Pinney's Bateman Lecture Notes: Ma 255: <i>Methods of Mathematical Physics</i> I 1939-1940</b>
Box 6, Folder 6	<b>Edmund Pinney's Bateman Lecture Notes: Ma 255: <i>Methods of Mathematical Physics</i> II 1939-1940</b>
Box 6, Folder 7	<b>Edmund Pinney's Bateman Lecture Notes: Ma 255: <i>Methods of Mathematical Physics</i> III 1939-1940</b>
Box 6, Folder 8	<b>Edmund Pinney's Bateman Lecture Notes: Ma 255: <i>Methods of Mathematical Physics</i> IV 1939-1940</b>
Box 6, Folder 9	<b>Edmund Pinney's Bateman Lecture Notes: Ma 255: <i>Methods of Mathematical Physics</i> V 1939-1940</b>
Box 6, Folder 10	<b>Edmund Pinney's Bateman Lecture Notes: Ma 255: <i>Methods of Mathematical Physics</i> VI 1939-1940</b>
Box 6, Folder 11	<b>Edmund Pinney's Bateman Lecture Notes: Ma 258: <i>Partial Differential Equations of Mathematical Physics</i> I 1940-1941</b>
Box 6, Folder 12	<b>Edmund Pinney's Bateman Lecture Notes: Ma 258: <i>Partial Differential Equations of Mathematical Physics</i> II 1940-1941</b>
Box 6, Folder 13	<b>Edmund Pinney's Bateman Lecture Notes: Ma 258: <i>Partial Differential Equations of Mathematical Physics</i> III 1940-1941</b>
Box 6, Folder 14	<b>Edmund Pinney's Bateman Lecture Notes: Ma 258: <i>Partial Differential Equations of Mathematical Physics</i> IV 1940-1941</b>
Box 6, Folder 15	<b>Edmund Pinney's Bateman Lecture Notes: Ma 258: <i>Partial Differential Equations of Mathematical Physics</i> V 1940-1941</b>
Box 6, Folder 16	<b>Edmund Pinney's Bateman Lecture Notes: Ma 258: <i>Partial Differential Equations of Mathematical Physics</i> VI 1940-1941</b>
Box 7, Folder 1	<b>Edmund Pinney's Bateman Lecture Notes: Ae 268: <i>Compressible Fluids</i> I 1942</b>
Box 7, Folder 2	<b>Edmund Pinney's Bateman Lecture Notes: Ae 268: <i>Compressible Fluids</i> II 1942</b>
Box 7, Folder 3	<b>Edmund Pinney's Bateman Lecture Notes: Ae 268: <i>Compressible Fluids</i> Problems 1942</b>
Box 7, Folder 4	<b>Edmund Pinney's Bateman Lecture Notes: Ph 221: <i>Potential Theory</i> Spring 1942</b>
Box 7, Folder 5	<b>Edmund Pinney's Bateman Lecture Notes: Ph 221: <i>Potential Theory</i> undated circa 1942</b>
Box 7, Folder 6	<b>Edmund Pinney's Review of Bateman Courses for Final Doctorate Examination 1942</b>
Box 8, Folder 1	<b>Reprints 1903-1919</b>
Box 8, Folder 2	<b>Reprints 1920-1929</b>
Box 8, Folder 3	<b>Reprints 1930-1939</b>
Box 8, Folder 4	<b>Reprints 1940-1947, undated</b>

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