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## **SILAS W. HOLMAN**

Papers, 1875-1910 (bulk 1885-1900)

Manuscript Collection - MC 46

4 record cartons, 1 legal manuscript box

4.6 cubic feet

Accession number: 1977-76

Processed: April 2006

By: Marcus Verduchi

### **ACCESS**

There are no restrictions on access to the collection.

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## BIOGRAPHICAL NOTE

Silas Whitcomb Holman (1856-1900) was an 1876 graduate of MIT, earning the degree of S.B. in Physics. Upon his graduation he was appointed an assistant in the Department of Physics. He stayed at MIT throughout his life, moving up the ranks to instructor (1880), assistant professor (1882), associate professor (1885), professor (1893), and professor emeritus (1897).<sup>1</sup> He was a respected researcher, a well-liked instructor, a compelling expository writer, and an able administrator during the infancy of the Department of Physics.

Holman attended Cambridge public schools and, after three years of high school, enrolled at MIT in the fall of 1872. In 1873 he enrolled in the newly established Course in Physics; in this year he was also made a commissioned officer in the Institute Battalion and elected President of his Class Association.<sup>2</sup> Holman studied under Edward C. Pickering, first director of the Rogers Laboratory of Physics and Thayer Professor of Physics.<sup>3</sup>

In 1876 Holman graduated and was shortly thereafter named an Assistant in Physics. His thesis, "The Atomic Theory as Applied to Gases," was published in the Proceedings of the American Academy of Arts and Sciences. He was unable to assume his position in the laboratory because of a painful condition causing "lameness" in one knee.<sup>4</sup>

In 1877 he was able to begin teaching and doing experimental work. Professor Charles R. Cross (MIT, class of 1870) became the director of the Department of Physics and the Rogers Laboratory, with Holman as his assistant. Holman directed research in the laboratory, while Cross gave most of the lectures. In 1883 the Rogers Laboratory relocated from its cramped single room in the Rogers Building to a much more expansive space in what was called the "New Building" (later renamed "Walker"). Holman played a major role in outfitting the physics department's new space—he was responsible for special laboratories dedicated to electrical measurements and high-temperature heat measurements.<sup>5</sup>

Holman married twice, first to Marie O. Glover (MIT, class of 1881), herself a published researcher, in July 1884. Marie died less than a year later, and in 1886 Holman married Lydia M. Newman. Their daughter Anna was born in 1892. Towards the end of his life Holman was blind and unable to move under his own power, but he was able to continue writing and directing research thanks to the efforts of his wife, who conducted literature searches, took dictation, and assisted him with his work. Holman died on 1 April 1900.<sup>6</sup>

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<sup>1</sup> John R. Freeman (MIT 1876). "Silas W. Holman." Reprinted from the *Technology Review*, Vol. III, No. 1 (Boston: George H. Ellis, 1901), 6-9.

<sup>2</sup> *Ibid*, 4-5.

<sup>3</sup> Tenney L. Davis (MIT 1913) and H. M. Goodwin (MIT 1890). *A History of the Departments of Chemistry and Physics at the Massachusetts Institute of Technology 1865-1933* (Cambridge: The Technology Press, 1933), 19-21.

<sup>4</sup> Freeman, 5-7.

<sup>5</sup> Tenney and Goodwin, 23-25; 27-28.

<sup>6</sup> Freeman, 8; 17-18.

## **PROVENANCE NOTE**

The Holman papers were donated to the Institute Archives in 1970. In 1978, a set of 64 photographs constituting part of the original donation were transferred to the MIT Museum.

## **SCOPE AND CONTENT NOTE**

This collection mainly consists of records documenting Silas W. Holman's professional life at MIT. The earliest documents are diaries, notes, and drafts of papers from the years 1873-1876, when Holman was an undergraduate studying physics. The bulk of the collection dates from 1885 to 1910. Series III is the highlight of the collection, providing detailed information about the laboratory and classroom methods used to teach physics in the early years of MIT's existence. The photographs in Series VI also document the Rogers Laboratory, showing the space and equipment that Holman used while he taught.

During his most active years, Holman produced a diverse array of documents. As a young instructor and assistant to the head of the Department of Physics, Holman conducted and directed research, prepared papers for publication, gave lectures, and corresponded with his colleagues. All of these activities are well represented in Series I through V.

Series I is composed of Silas Holman's correspondence. Although most is work related, some personal and family letters are included in the correspondence folders. Holman kept letterpress books with copies of his own letters, in addition to the originals of letters he received. The bulk of this material falls between the years 1885 and 1895.

Series II contains notes for Holman's laboratory experiments. These are concentrated early in his career, when his health permitted his own research. When his health began to fail he first directed the research of others, rather than continuing to conduct the experiments himself. Some of this research, done under his supervision, is represented in this collection.

Series III contains lecture notes, tests and sample problems, and laboratory procedures. Following the example of his own teacher, Edward Pickering, Holman created standard sets of notes and directions for experiments for the use of his students. Holman described these books as "printed, but not published"—they went through editions and were lithographed by a printer, but they remained only as tools for MIT students, not general textbooks.

Series IV contains drafts of papers, manuscripts of books, unpublished writings, and Holman's own notes on the writings and research of others.

Series V is composed only of published materials, such as copies of Holman's books and reprints of his contributions to scientific journals. It also includes scientific published matter written by others and collected by Holman.

Series VI contains family correspondence and memorabilia including material relating to his wife, Lydia Newman Holman, and his daughter, Anna E. Holman. The material created by Silas Holman takes the form of diaries and drawings from his adolescent and college years (MIT class of 1876). Of interest is a folder of material created after a visit to Mt. Wachusett in Massachusetts in 1876 during which he made calculations regarding the altitude and a drawing (the Ideal View) of the White Mountains in New Hampshire. A letter about the drawing from MIT colleague and fellow outdoor enthusiast William Pickering is included. Holman's lifelong involvement in the outdoors later with his family is reflected in the plans for their summer home (1890), and in a set of canoe catalogs. The bulk of material in this series dates after Silas Holman's death in 1900. Lydia Holman's continuing relationship with MIT after her husband's death is documented by invitations and programs for dinners, reunions, and Alumni Association events. The correspondence between his daughter Anna E. Holman and her friends when she was a young girl covers the period 1901-1910.

<b>Box</b>	<b>Folder</b>	<b>Contents</b>	(O) = Oversize
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### **SERIES I. CORRESPONDENCE**

1	1	Correspondence, 1876, 1880-1884	
1	2	Alumni Fund, 1879-1880	
1	3	Correspondence, 1885-1886, 1888-1890	
1	4	Catalogs and Advertisements, 1885-1895	
1	5	History of MIT, 1885-1898	
1	6	Letterpress book, 30 September 1887 - 21 August 1889	
1	7	Letterpress book, 6 December 1888 - 10 June 1889	
1	8	Letterpress book, 27 September 1889 - 8 June 1893	
1	9	Correspondence, 1891-1897	
1	10	Pure Metals, 1895	
1	11	Correspondence, January - October 1898	
1	12	Correspondence, November - December 1898	
1	13	Correspondence, 1899, 1902	
1	14	Opinion about a General Course at the Institute, 19 February 1900	

### **SERIES II. RESEARCH NOTES**

1	15	Miscellaneous, 1876-1882	
1	16	Thermometer Comparisons. Baltimore, January – February 1879	
1	17	Errors of Cathetameter Scale. Comparison With Standard Metre by Prof. W. A. Rogers, February 1879	
1	18	Measurement of Temperature, ca. 1880-1881	
1	19	On the Use of the Mercury Thermometer at High Temperatures, Part 3, ca. 1880-1881	
1	20	On the Friction of Leather Belts on Iron Pulleys, ca. 1882	
1	21	Special Notes on Lab Work, Colton File #1, ca. 1885-1888	

<b>Box</b>	<b>Folder</b>	<b>Contents</b>	(O) = Oversize
1	22	Special Notes on Lab Work, Colton File #2, ca. 1884-1888	
1	23	Special Notes on Lab Work, Colton File #2, ca. 1884-1887	
1	24	Special Notes on Lab Work, Colton File #2, ca. 188?	
1	25	Special Notes on Lab Work, Colton File #2, ca. 1888-1889	
2	41	Original Binders for Colton Files, ca. 1884-1889	
1	26	Melting and Boiling Points. Data and References, 1894-1895	
<b>SERIES III. TEACHING MATERIALS</b>			
1	27	Examination Papers, 1873-1893	
1	28	Laboratory Experiments, ca. 1881-1883	
1	29	Physical Laboratory Notes, ca. 1883	
1	30	Lowell Course on Heat, 1884	
4	1(O)	Heat Questions with Answers, 1884-1892	
1	31	Heat Lecture Notes, 1886	
1	32	Precision of Measurements as Given in 1886-1887 to 4 <sup>th</sup> Year Electrical Engineers	
1	33	Heat Lecture Problems, 1886-1889	
1	34	Heat Lectures. Additional References, etc., 1886-1893	
1	35	Heat Examination Papers, 1886-1893	
1	36	Thermometry 0° - 100°, ca. 1887+	
1	37	Thermometry 0° - 100°, ca. 1887+	
1	38	Heat Lecture, 1892	
1	39	Heat Lecture. Additional References, etc., ca. 1892+	
1	40	Discussion of the Precision of Measurements. Lecture Memos, Corrections and Suggestions, 1895	
1	41	Laboratory Notes, undated	

<b>Box</b>	<b>Folder</b>	<b>Contents</b>	(O) = Oversize
<b>SERIES IV. WRITINGS</b>			
2	1	Index Rerum, 1875	
2	2	Paper on Kinetic Theory of Gases. Other MSS. written at MIT, 1875-1879	
2	3	Illustrations of the Dynamical Theory of Gases, ca. 1876+	
2	4	Calibration Studies, 1878-1881	
2	5	Viscosity of Gases. Computations and Notes, 1878-1884	
2	6	Reduction Tables, 1879	
2	7	New Suggestions, 1879	
2	8	Air Thermometer, ca. 1879+	
2	9	Electricity, 1881	
2	10	Friction of Leather Belts, 1881-1882	
2	11	E.M.F. and Resistance of Battery. Special Directions. Old Papyrographed List of Methods, ca. 1884+	
2	12	American Association Paper on Thermometry, 1885	
2	13	Viscosity of Gases. Notes Made in 1885	
2	14	On the Effect of Temperature on the Viscosity of Air, 1885	
2	15	On the Effect of Temperature on the Viscosity of Gases, 1885	
2	16	Heat Notes, 1886	
2	17	Precision of Measurements, February 1888	
2	18	Energy, Work, and Force, ca. 1890s	
2	19	Force, 1891-92	
2	20	Telephone, ca. 1893	
2	21	Energy. Force., 1894	
2	22	Draft of First Portion of Electrical Measuring Instruments, ca. 1894-1897	

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2	23	Cooling Correction Notes, 1894-1895	
2	24	Thermo-Electrics of Pt-Ir Alloy. Barus Data and Computation, 1894	
2	25	Thermo-Electrics of Pt-Rh Alloys. H.[?]W. Data and Computation, 1894	
2	26	Thermometry and Pyrometry. Miscellaneous References, 1894-1895	
2	27	Telephone, 1894-1895	
2	28	Thermo-Electrics. General Notes, 1894-1895	
2	29	Thermo-Electrics of Chemically Pure Metals. Noll Data and Computations, 1895	
2	30	Notes on Articles on Gases and Heat, ca. 1895	
2	31	Res of Pt, ca. 1895+	
2	32	Slide Rule, June 1897	
2	33	Preface [Matter, Energy, Force and Work], 1897	
2	34	Microphone, 1899	
2	35	Philosophy of Science, 1899	
2	36	Places of Figures, January 1900	
2	37	Notes on Articles on Gases and Heat, undated	
2	38	Mercurial Thermometer, undated	
2	39	Thompson Reflecting Galvanometer. Special Additional Notes, undated	
2	40	Life and Mind as Related to Energy, undated	

### **SERIES V. PUBLISHED MATERIALS**

3	1	Papers on Physics, 1876-1896	
3	2	Simple Method for Calibrating Thermometers, 8 March 1882	

<b>Box</b>	<b>Folder</b>	<b>Contents</b>	(O) = Oversize
3	3	<i>The Manual Element in Education.</i> by John D. Runkle, 1882	
3	4	The Effect of Temperature on the Viscosity of Gases, 13 May 1885	
3	5	On the Friction of Leather Belts on Iron Pulleys, September 1885	
3	6	<i>Physical Laboratory Notes</i> , 1885	
3	7	<i>Physical Laboratory Notes</i> , 1885	
3	8	<i>Physical Laboratory Notes</i> , Editions 1 to 4, 1885	
3	9	<i>Heat: Lecture Notes Prepared for the Use of Students at the Massachusetts Institute of Technology</i> , 1886	
3	10	<i>Lecture Notes</i> , 1886, 1888, 1891	
3	10	<i>Physical Laboratory Notes</i> , Editions 5 to 8, 1892	
3	11	<i>Discussion of the Precision of Measurements</i> , 1892	
3	12	Revue Scientifique, 1892, 1895	
3	13	Fundamental Standards of Length and Mass, 1893	
3	14	Calorimetry: Methods of Cooling Correction, 13 November 1895	
3	15	Thermo-Electric Interpolation Formulæ, 13 November 1895	
3	16	Melting Points of Aluminum, Silver, Gold, Copper, and Platinum, 13 November 1895	
3	17	Pyrometry: Calibration of the Le Chatelier Thermo-Electric Pyrometer, 13 November 1895	
3	18	Galvanometer Design: Waste Space Near The Needle, December 1895	
4	2(O)	Nouvelles Déterminations des Mètres Étalons [J.-René Benoît and Ch.-Ed. Guillaume], 1895	
3	19	Thermo-Electric Interpolation Formulæ, June 1896	
3	20	Melting Points of Aluminum, Silver, Gold, Copper, and Platinum, July 1896	
3	21	<i>Computation Rules and Logarithms</i> , 1896	

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3	22	General Principles of the Method of Least Squares, with Applications [Dana P. Bartlett, S.B.], 1896	
4	3	<i>The Telescope-Mirror-Scale Method; Adjustments and Tests</i> , May 1898	
4	4	Johns Hopkins University circulars, June 1898	
4	5	<i>Matter, Energy, Force and Work</i> , 1898	
4	6	"The Function of the Laboratory" <i>Technology Review</i> , January 1899	
<b>SERIES VI. FAMILY CORRESPONDENCE AND MEMORABILIA</b>			
5	1	Holy Bible belonging to Silas W. Holman, 1874	
5	2	Diary, course notes 1873-1874	
5	3	Diary, vacation notes, summer 1875	
5	4	Diary, trip to Azores, March 1877	
5	5	Photograph of Silas Holman, 1876	
5	6	Sleeve for 1876 photograph	
4	7(O)	Calculations sheets, drawing "Ideal View of White Mountains from Wachusett", letter from William Pickering 1876	
5	7	Lydia Newman, State of Maine Teaching Certificate, 1877	
4	8(O)	Patents, 3 May 1882	
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5	9	Photograph, unidentified ca. 1883	
5	10	Duplicates and original box for photograph in Box 5/Folder 9	
5	11	Photographs MIT, Persons & Rooms, ca. 1883	
5	12	Copyrights, 1885-1898	

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5	14	The Residence [Bear Island, NH] 1890	
5	15	<i>Special Catalogue of Mathematical Instruments, Drawing Materials, Scientific Books, 1891</i>	
4	10(O)	Contracts with Publishers, 1892, 1895, 1898	
5	16	<i>In Memoriam. Lewis Mills Norton. 10 May 1893</i>	
5	17	Patents, 1895	
5	18	<i>In Memory of Francis Amasa Walker, December 1897</i>	
5	19	Clippings related to <i>Matter, Energy, Force and Work</i> , 1898-1899	
5	20	<i>Sumner Hollingsworth, 1899</i>	
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5	30	Invitation to the White House, Rev. & Mrs. S.M. Newman, 1904	
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