

Claude Elwood Shannon

A Register of His Papers in the Library of Congress

Prepared by Joseph K. Brooks



Manuscript Division, Library of Congress

Washington, D.C.

2003

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Latest revision: 2004-07-19

Collection Summary

Title: Papers of Claude Elwood Shannon

Span Dates: 1932-1995

Bulk Dates: (bulk 1938-1989)

ID No.: MSS84831

Creator: Shannon, Claude Elwood, 1916-2001

Extent: 7,000 items; 20 containers plus 1 oversize, 1 computer file, and 1 classified; 8 linear feet

Language: Collection material in English

Repository: Manuscript Division, Library of Congress, Washington, D.C.

Abstract: Mathematician, information theorist, and computer scientist. Correspondence, scientific papers, theorems, topical files, articles, notes, speeches, and miscellaneous material relating to Shannon's professional life.

Selected Search Terms

The following terms have been used to index the description of this collection in the Library's online catalog. They are grouped by name of person or organization, by subject or location, and by occupation and listed alphabetically therein.

Names:

Shannon, Claude Elwood, 1916-
Andrew, Merle M.--Correspondence
Ashby, William Ross--Correspondence
Berkeley, Edmund Callis--Correspondence
Biunno, Vincent P.--Correspondence
Bode, Hendrik W. (Hendrik Wade), 1905- --Correspondence
Brown, Gordon Stanley, 1907-1996--Correspondence
Campbell, John William, 1889- --Correspondence
Casby, James U.--Correspondence
Dowling, Kevin--Correspondence
Elias, P. (Peter)--Correspondence
Flanagan, Dennis, 1919- --Correspondence
Flood, Merrill Meeks, 1908- --Correspondence
Gabor, Dennis, 1900- --Correspondence
Hubbard, L. Ron (La Fayette Ron), 1911- --Correspondence
Kleene, Stephen Cole, 1909- --Correspondence
Lasker, Edward, 1885- --Correspondence
Levy, David N. L.--Correspondence
Liversidge, Anthony--Correspondence
McCarthy, John, 1927- --Correspondence
Moore, Edward F.--Correspondence
Pierce, John Robinson, 1910- --Correspondence
Piore, Emanuel Ruben, 1908- --Correspondence
Price, G. Baley (Griffith Baley), 1905- --Correspondence
Sagan, Carl, 1934- --Correspondence
Shneidman, Edwin S.--Correspondence
Singmaster, David--Correspondence
Stratton, Julius Adams, 1901- --Correspondence
Uttley, A. M.--Correspondence
Von Neumann, John, 1903-1957--Correspondence
Weaver, Warren, 1894- --Correspondence
Bell Telephone Laboratories, inc.

Subjects:

Computer chess
Computer games

Computers
Games--Data processing
Information theory
Telecommunication

Occupations:

Computer scientists
Information theorists
Mathematicians

Administrative Information

Provenance:

The papers of Claude Elwood Shannon, mathematician, information theorist, and computer scientist, were given to the Library of Congress by Mary E. Shannon in 2001.

Copyright Status:

The status of copyright in the unpublished writings of Claude Elwood Shannon is governed by the Copyright Law of the United States (Title 17, U.S.C.).

Security Classified Documents:

Government regulations control the use of security classified items in this collection. Manuscript Division staff can furnish information concerning access to and use of any classified items.

Preferred Citation:

Researchers wishing to cite this collection should include the following information: Container number, Claude Elwood Shannon Papers, Manuscript Division, Library of Congress, Washington, D.C.

Biographical Note

<i>Date</i>	<i>Event</i>
1916, Apr. 30	Born, Petoskey, Mich.
1936	B.S., University of Michigan, Ann Arbor, Mich.
1940	M.Sc., electrical engineering, and Ph.D., mathematics, Massachusetts Institute of Technology, Cambridge, Mass.
1940-1941	Fellow, Institute for Advanced Study, Princeton, N.J.
1948	Published "A Mathematical Theory of Communication," <i>Bell System Technical Journal</i>
1949	Married Mary E. Moore
1941-1958	Research mathematician, Bell Telephone Laboratories, Murray Hill, N.J.
1958-1978	Donner Professor of Science, Massachusetts Institute of Technology, Cambridge, Mass.
1985	Awarded Kyoto Prize
2001, Feb. 24	Died, Medford, Mass.

Scope and Content Note

The papers of Claude Elwood Shannon (1916-2001), mathematician, computer scientist, and information theorist, span the years 1932-1995, with the bulk of the material dating from 1938 to 1989. Shannon established the field of information theory with several seminal scientific papers, including “A Mathematical Theory of Communication,” published in 1948. He was first to realize that the bit, expressed mathematically with only two symbols, ones and zeros, could serve as the basic unit of any kind of electronically generated information in communications and computer systems. His papers are organized in [Correspondence](#), [Speeches and Writings](#), [Miscellany](#), [Oversize](#), [Computer File](#), and [Classified](#) series. A few documents are in French, German, Russian, or Japanese.

The [Correspondence](#) series, grouped in general and postcard files, documents the promulgation of ideas based on information theory, not only in mathematics, computer science, electrical engineering and other scientific and technical fields, but in sociology, law, economics, psychology, linguistics, and literature as well. The correspondence also relates to areas in which Shannon's professional and avocational interests converged, such as programming computers and automata to play chess and other games, run mazes, juggle, and solve puzzles. There is also additional material on these topics in the [Miscellany](#) series. Scientific papers attached to general correspondence have been filed in the [Miscellany](#) series. The postcards are related mostly to the distribution of Shannon's scientific papers during 1948-1951.

Correspondents include Merle M. Andrew, William Ross Ashby, Edmund Callis Berkeley, Vincent Biunno, Hendrik W. Bode, Gordon Stanley Brown, John William Campbell, James U. Casby, Kevin Dowling, Peter Elias, Dennis Flanagan, Merrill M. Flood, Dennis Gabor, L. Ron Hubbard, Stephen Cole Kleene, Edward Lasker, David N. L. Levy, Anthony F. Liversidge, John McCarthy, Edward F. Moore, John R. Pierce, Emanuel R. Piore, G. Baley Price, Carl Sagan, Edwin S. Shneidman, David Singmaster, Julius Adams Stratton, A. M. Uttley, John Von Neumann, and Warren Weaver.

Articles and scientific papers among the [Speeches and Writings](#) series, including theorems, are organized in alphabetical and chronological files. Dated articles and scientific papers are arranged chronologically, while the undated material is organized alphabetically by title. Shannon's articles and papers published under the auspices of his employer, Bell Telephone Laboratories, Murray Hill, New Jersey, and meant for general dissemination are part of the [Speeches and Writings](#), but technical memoranda, Shannon's work produced at the company, are part of the Bell Telephone Laboratories file in the [Miscellany](#) series.

Organization of the Papers

The collection is arranged in six series:

- [Correspondence, 1938-1995, n.d.](#)
- [Speeches and Writings, 1938-1987, n.d.](#)
- [Miscellany, 1932-1993, n.d.](#)
- [Oversize, 1949-1953, n.d.](#)
- [Computer File, 1993](#)
- [Classified, 1940-1943, n.d.](#)

Description of Series

<i>Container</i>	<i>Series</i>
BOX 1-5	<p><u>Correspondence, 1938-1995, n.d.</u></p> <p>General correspondence with attached material and postcards between Shannon and colleagues, professional associates, scholars, friends, and the public relating to information theory, mathematics, artificial intelligence, computer technology, and other professional interests. Arranged in files of general correspondence and postcards and thereunder chronologically.</p>
BOX 6-11	<p><u>Speeches and Writings, 1938-1987, n.d.</u></p> <p>Scientific papers, articles, theorems, speeches, lecture notes, interviews, poems, songs, bibliographies, book reviews, and a television program script. Arranged alphabetically by type of material and alphabetically or chronologically thereunder.</p>
BOX 11-20	<p><u>Miscellany, 1932-1993, n.d.</u></p> <p>Subject files, notes, drawings, diagrams, graphs, technical memoranda, patents, scientific papers, printed matter, and miscellaneous material. Arranged alphabetically by subject or type of material and chronologically thereunder.</p>
BOX OV 1	<p><u>Oversize, 1949-1953, n.d.</u></p> <p>Diagrams and drawings. Arranged and described according to the series, containers, and folders from which the items were removed.</p>
BOX CF 1	<p><u>Computer File, 1993</u></p> <p>Computer game. Arranged and described according to the series, container, and folder from which the item was removed.</p>
BOX CL1	<p><u>Classified, 1940-1943, n.d.</u></p> <p>Documents containing security information removed from the collection. Arranged and described according to the series and folders from which the items were removed.</p>

Container List

<i>Container</i>	<i>Contents</i>
BOX 1-5	Correspondence, 1938-1995, n.d. General correspondence with attached material and postcards between Shannon and colleagues, professional associates, scholars, friends, and the public relating to information theory, mathematics, artificial intelligence, computer technology, and other professional interests. Arranged in files of general correspondence and postcards and thereunder chronologically.
BOX 1	General 1938-1955 <i>See also Container 19, Scientific papers by others, Miscellany</i> (12 folders)
BOX 2	1956-1958 <i>See also Container 19, Scientific papers by others, Miscellany</i> (10 folders)
BOX 3	1959-1979 <i>See also Container 19, Scientific papers by others, Miscellany</i> (9 folders)
BOX 4	1980-1985 (10 folders)
BOX 5	1986-1995, n.d. (6 folders) Postcards regarding distribution of scientific papers, 1948-1951, n.d. (2 folders)
BOX 6-11	Speeches and Writings, 1938-1987, n.d. Scientific papers, articles, theorems, speeches, lecture notes, interviews, poems, songs, bibliographies, book reviews, and a television program script. Arranged alphabetically by type of material and alphabetically or chronologically thereunder.
BOX 6	Articles and scientific papers Alphabetical file, n.d. A-L (9 folders)
BOX 7	M-T (10 folders)
BOX 8	U-Z and untitled (3 folders) Chronological file 1938-1946 (7 folders)
BOX 9	1948-1955 (8 folders)
BOX 10	1956-1978 (5 folders) Bibliographies and table of contents, 1956, n.d. Book reviews, 1956, 1962, n.d. Poems and songs, ca. 1981-ca. 1982, n.d.

Speeches and Writings, 1938-1987, n.d.

Container

Contents

	Speeches, lectures, and interviews 1947-1984, n.d. (3 folders)
BOX 11	1985-1987, n.d. (2 folders) Television program, script, n.d.
BOX 11-20	Miscellany, 1932-1993, n.d. Subject files, notes, drawings, diagrams, graphs, technical memoranda, patents, scientific papers, printed matter, and miscellaneous material. Arranged alphabetically by subject or type of material and chronologically thereunder.
BOX 11	Antique Store of the 21st Century, Brookline, Mass., 1983 American Academy of Achievement, Dallas, Tex., 1966-1967 Artificial intelligence, 1955, 1978, 1984, n.d. Bell Telephone Laboratories, Murray Hill, N.J. 3-Relay Kit, n.d. Diagrams and photographs International Morse decoder, number display circuit, perpetual calendar, relay circuit analyzer, 1953, n.d. <i>See Oversize</i> Miscellany, 1940, 1949-1953, n.d. <i>See Classified</i> Miscellany, 1943-1956 <i>See also Classified</i> Patents, 1946-1953, n.d.
BOX 12	Technical memoranda, 1940-1955 (5 folders) Berkeley, Edmund C. Miscellany, 1950-1954, n.d. Probability and statistical kit, 1960, n.d. Bibliographies regarding communication theory and machine self- reproduction, n.d.
BOX 13	Biographical material, ca. 1951, 1961-1989, n.d. Brain, mind, and nervous system, n.d. Notes Typescripts Cember, Richard P., <i>Word for Word</i> , computer game, 1993 <i>See also Computer File</i> Codrington Club, Oxford, England, 1980, n.d. Computer memory, bits storage capacity, 1949 Ephemera, 1948, n.d. Game playing and puzzle solving machines Chess Articles and scientific papers, 1950-1955, 1989, n.d. Miscellany, n.d. Condon, Edward U., Nim playing machine, 1940 Maze running Miscellany, 1956, 1978-1979, n.d. Theseus, n.d. Miscellany, 1953-1955, n.d.
BOX 14	Rubik cube solving machines

Miscellany, 1932-1993, n.d.

Container

Contents

	Miscellany, 1981-1982, n.d.
	Singmaster, David, 1981-1982
	Gaussian channels, n.d.
	Generalized central limit theorem, n.d.
	Harvard University, Cambridge, Mass., Whole Sky Search for Life project, 1982-1984, n.d.
	Harvey Prize, Israel Institute of Technology, Haifa, Israel, 1972, n.d.
	Information and communications quotations, n.d.
	Institute for Advanced Studies, Princeton, N.J., 1940, 1977
	Institute of Radio Engineers, Professional Group on Information Theory, 1955
	Juggling machines
	Articles
	By Shannon, n.d.
	By others, 1979-1982, n.d.
	Miscellany, 1980-1984, n.d.
BOX 15	Notes, n.d.
	(4 folders)
	Kolota, Gina, "A Math Image Problem," 1986
	Lang, Serge, 1988
	Machine handwriting recognition, n.d.
	Massachusetts Institute of Technology, Cambridge, Mass.
	Mechanical hands, 1958-1960, n.d.
	Miscellany, 1950-1965, 1972-1973, 1979, 1985, n.d.
	Musical instruments, pitch meters, and metronomes, n.d.
BOX 16	Notes
	Diagrams, drawings, and tables, 1949-1951, n.d.
	(5 folders)
	<u>See also Oversize</u>
	Miscellany
	1957, n.d.
	(4 folders)
BOX 17	(7 folders)
BOX 18	(7 folders)
BOX 19	Notebooks and forms, n.d.
	Photographs of Shannon, n.d.
	Research proposals, 1957, n.d.
	Scientific papers by others
	Automata studies project, 1955, n.d.
	Miscellany, 1932, 1939-1942, 1952-1960, 1981, n.d. <u>See also Containers 1-3, General</u>
	(5 folders)
	Siforov, Vladimir L., 1966
BOX 20	Statistical English, codes, and translating machines, 1948-1949, n.d.
	Statue of Albert Einstein, Washington, D.C., 1978-1979, n.d.
	Symposia and meetings
	Miscellany, 1950, 1958, 1965, 1972, 1985, n.d.
	"Skeleton Key to the Information Seminar—Notes," n.d.
	(3 folders)
	THROBAC (Thrifty Roman Numeral Backward Looking Computer), 1953

Miscellany, 1932-1993, n.d.

Container

Contents

Unicycles and related problems, n.d.
Unsolved mathematical problems, n.d.

BOX OV 1

Oversize, 1949-1953, n.d.

Diagrams and drawings.
Arranged and described according to the series, containers, and folders from which the items were removed.

BOX OV 1

Bell Telephone Laboratories, Murray Hill, N.J.

Diagrams and photographs

International Morse decoder, number display circuit, perpetual calendar, and relay circuit analyzer, 1953, n.d. (Container 11)

Notes

Diagrams, drawings, and tables, 1949-1951, n.d. ([Container 16](#))

BOX CF 1

Computer File, 1993

Computer game.

Arranged and described according to the series, container, and folder from which the item was removed.

BOX CF 1

Miscellany, 1932-1993, n.d.

Cember, Richard P., *Word for Word*, computer game, 1993 ([Container 13](#))

BOX CL1

Classified, 1940-1943, n.d.

Documents containing security information removed from the collection.

Arranged and described according to the series and folders from which the items were removed.

BOX CL 1

Bell Telephone Laboratories, Murray Hill, N.J.

Diagrams and photographs

Miscellany, n.d. (Container 11)

Miscellany

Analogue for the Vernam System for Continuous Time Series, Case 20878, 1943, May 10 ([Container 11](#))

Pulse Code Modulation, Case 20878, Dec. 1, 1943 ([Container 11](#))

Washington, J.S.M., cable to War Cabinet Offices, London, England, 1943, Feb. 20 ([Container 11](#))