Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC: George D. Birkhoff Residence

AND/OR COMMON: 22 Craigie

2 LOCATION

STREET & NUMBER: 22 Craigie

__NOT FOR PUBLICATION

CITY, TOWN: Cambridge __ VICINITY OF

CONGRESSIONAL DISTRICT: Eighth

STATE: Massachusetts CODE: 25 COUNTY: Middlesex CODE: 017

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	__PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
X BUILDING(S)	X PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
__STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	X PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	__YES: UNRESTRICTED	__INDUSTRIAL	__TRANSPORTATION
		X NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME: Oliver and Agnus V. Brooks

STREET & NUMBER: 22 Craigie

CITY, TOWN: Cambridge __ VICINITY OF STATE: Massachusetts

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC: Middlesex Registry of Deeds, Southern District

STREET & NUMBER: 3rd and Ottis Streets

CITY, TOWN: Cambridge STATE: Massachusetts

6 REPRESENTATION IN EXISTING SURVEYS

TITLE: None

DATE

__FEDERAL __STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS

CITY, TOWN STATE

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
X EXCELLENT	__DETERIORATED	__UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	X ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

22 Craigie Street in Cambridge, Massachusetts, is a three story frame structure which according to its present owner was built in the 1890's. The style and the known dates of other houses on the block would indicate that it was probably built at an earlier date. The architect is unknown. The design is French Revival, a popular style of the period. The house is not noted in the Cambridge Historical Commission's study of Cambridge architecture (Old Cambridge, 1973). It thus appears to be of no architectural importance.

The integrity of the exterior is whole. No significant changes have been made since its construction. The interior, a typical central hall plan, has been modified by the conversion of a first floor parlor into a cathedral ceiling type living area. Other changes include the installation of a modern kitchen and the addition of a bath. With the exception of these changes, the house is essentially the same as during the eight years (1920-1928) it was occupied by George D. Birkhoff.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	X SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	__ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	__TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES

BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

George David Birkhoff was born March 21, 1881, near Holland, Michigan. When he was two, his father, a physician, moved the family to Chicago. Birkhoff grew up in Chicago. After attending the Lewis Institute, he entered the University of Chicago. Birkhoff did not complete his undergraduate study at Chicago, but instead transferred to Harvard where he received a B.A. in 1905 and a M.A. in 1906. While at Harvard Birkhoff studied under Professor Maxime Bocher. Birkhoff returned to Chicago for his Ph.D. His dissertation was on a subject close to Professor Bocher's interests. According to his Dictionary of American Biography biographer, the dissertation was "powerful" and "forceful."

Upon completion of graduate study Birkhoff entered the halls of academia which were to be his home for the rest of his life. His first position was at the University of Wisconsin as an instructor in mathematics. A year later he moved to Princeton as a preceptor. Although he quickly rose to full professor, Birkhoff remained only three years at Princeton. In 1912 he answered a call to his alma mater on the banks of the Charles.

Birkhoff remained at Harvard for the rest of his life. His first love was mathematical research, but he was also a gifted teacher. Although not a polished lecturer, students found him very stimulating and a significant number of his graduate students later achieved prominence in mathematics.

Birkhoff was totally dedicated to his discipline and took little interest in the social and political concerns of the period. Frank in his relationships with others, he possessed a natural charm which endeared him to his family and friends. His son Garrett followed his footsteps and became a leading mathematician. Birkhoff's prominence in mathematics allowed him to travel extensively attending conferences and meetings. He enjoyed these travels a great deal and visited many countries in Europe, South America, and the Far East.

Birkhoff received practically every honor open to a mathematician. Numerous universities in this country and abroad conferred honorary doctorates on him. He belonged to all the societies and was president of the American Association for the Advancement of Science (1937) and the American Mathematical Society (1925). Among his numerous prizes and awards were the Newcomb Cleveland Prize (1926), the Querini-Stempalia Prize (1919), and the Bocher Prize (1923). He died of a coronary attack at his home in Cambridge on November 12, 1944.

(Continued)

9 MAJOR BIBLIOGRAPHICAL REFERENCES

George D. Birkhoff, Collected Mathematical Papers, (New York, 1950).
"George D. Birkhoff," Dictionary of American Biography, Supplement Three (New York, 1973).
Werner Heisenberg, Steps Over Borders (Munich, 1971).

(Continued)

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY less than one acre

UTM REFERENCES

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A	19	324780	4,619,360	B			
C				D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE
James Sheire, Historian — March 1975

ORGANIZATION — DATE
OAHP-Historic Sites Survey-National Park Service

STREET & NUMBER — TELEPHONE
1100 L Street NW.

CITY OR TOWN — STATE
Washington — D.C.

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ____ LOCAL ____

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

FEDERAL REPRESENTATIVE SIGNATURE

TITLE — DATE

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

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When Birkhoff's collected papers were published in 1950, several of his colleagues contributed to an introduction that assessed his contributions to mathematics. According to R. E. Langer, Birkhoff was above all an intellectual disciple of the great French mathematician Jules Henri Poincare. Oswald Veblen, a friend from his days at Chicago and Princeton, said Birkhoff took up the leadership in dynamics at the point where Poincare laid it down. Like Poincare, Birkhoff was deeply interested in applying mathematical analysis to the empirical concerns of the physical sciences in general and physics in particular. "Without a true model (mathematical) as a starting point," Birkhoff contended, "it does not seem likely that a final conception of the physical universe can be arrived at."

Birkhoff's mathematical interests are divided in four major areas: differential equations, dynamics, linear and Q-type difference equations, and theory of relativity. Although he made contributions to all four areas, he is best remembered for his work in dynamics and equations. His most spectacular accomplishments, which earned him a worldwide reputation, were, first, his solution of Poincare's so-called "last theorem," and, second, his own ergodic theorem. In the former Birkhoff while in his early thirties solved a theorem that Poincare had posited but had never been able to answer. According to a colleague, the theorem was "...no mere curiosity, but had an important bearing on the presence of periodic orbits in a dynamical system." In his ergodic theorem Birkhoff, according to the same observer, "...resolved in principle a problem of gas theory and statistical mechanics that had baffled theoretical physicists for half a century."

George D. Birkhoff's significance in the history of science in America is that he was, in the words of his friend and fellow mathematician H. S. Vandiver, "...widely regarded as the leading native American mathematician of his generation." In his history of Mathematical Thought from Ancient to Modern Times, Morris Kline calls Birkhoff, "one of the first great American mathematicians." And Marston Morse, also a colleague, writes, "During the major part of his life, Birkhoff was the acknowledged leader of American mathematics."

As the leading American mathematician of his generation, Birkhoff actively participated in one of the most fundamental characteristics of modern science, i.e. the formulation of laws of nature which conform to the mathematics in which they are expressed and which are empirically verifiable. Many physical sciences, and especially physics, no longer observed nature. The only thing the scientist "saw" was a mathematically formulated conception that was or was not empirically verifiable by means of its operationalization in a research process. In a crude sense the atom bomb verified $E=MC^2$. Birkhoff's participation in the

(Continued)

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search for a mathesis universalis was a demonstration that at the turn of this century science in America had come of age on the world scene.

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Major Bibliographical References: 22 Craigie

Morris Kline, Mathematical Thought from Ancient to Modern Times (New York, 1972).

H. S. Vandiver, "Some of My Recollections of George D. Birkhoff," Journal of Mathematical Analysis and Application, October, 1963.