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

1 NAME

HISTORIC
Charles F. Kettering House

AND/OR COMMON
Ridgeleigh Terrace

2 LOCATION

STREET & NUMBER
3965 Southern Boulevard — NOT FOR PUBLICATION

CITY, TOWN
Kettering — VICINITY OF

CONGRESSIONAL DISTRICT
3

STATE	CODE	COUNTY	CODE
Ohio	39	Montgomery	113

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	X EDUCATIONAL	—PRIVATE RESIDENCE
—SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	—ENTERTAINMENT	—RELIGIOUS
—OBJECT	—IN PROCESS	—YES: RESTRICTED	—GOVERNMENT	—SCIENTIFIC
	—BEING CONSIDERED	—YES: UNRESTRICTED	—INDUSTRIAL	—TRANSPORTATION
		X NO	—MILITARY	X OTHER:

4 OWNER OF PROPERTY

(Contact: Dr. Marlowe H. Schaffner, President)

NAME
Kettering Medical Center

STREET & NUMBER
3535 Southern Boulevard

CITY, TOWN
Kettering — VICINITY OF

STATE
Ohio

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.
Montgomery County Recorder's Office

STREET & NUMBER
451 West Third Street

CITY, TOWN
Dayton

STATE
Ohio

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Montgomery County Landmarks Committee Report; Ohio Historic Inventory; National Register of Historic Places

DATE
1968, 1976, 1976 — X FEDERAL X STATE X COUNTY —LOCAL

945

DEPOSITORY FOR SURVEY RECORDS
Montgomery County Historical Society; Ohio Historic Preservation Office; National Register of Historic Places

CITY, TOWN
Dayton, Columbus, Washington

STATE
Ohio, D.C.

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

From 1914 until his death in 1958 Charles F. Kettering occupied this two-story house of stucco and half-timber construction. It exhibits features of both Prairie Style and Jacobethan architecture and is situated on a wooded glacial moraine in semi-isolation. Designed by the Dayton architectural firm of Schenck and Williams, it overlooks Kettering Medical Center and College of Medical Arts and much of the Great Miami Valley below.

Although Ridgeleigh Terrace is only one of three known extant structures associated with Kettering, it boasts the longest and closest association with him. The Deeds Barn where he perfected the self-starter is extant, but it has been moved twice and stands some distance from its original site. It also has been given an entirely new roof and a modern concrete floor. Kettering also had a combination laboratory-office in the Annex of the General Motors Building in Detroit, but almost all traces of its original purpose were removed when this section of the building was converted into office space.

The eastward-facing Kettering House is an irregularly-shaped structure capped with a combination of pitched gable and flat roofs covered with green tiles. The house sits over a full basement dug out of the hillside and rests on foundations of stone rubble and concrete. Walls are stuccoed and feature dark painted rectilinear half timbers. The roof eaves with their exposed rafters project somewhat in typical Prairie School style, while the gables exhibit wide unadorned verge boards. The front entrance, which is marked by a three-bay-wide porté-cochere, features stone rubble construction with dressed stone pillars. Situated on each side of the front facade, near the main entrance, is an interior chimney of stone rubble construction. The rear (west) facade exhibits, near the north end of the house, a chimney of similar but somewhat larger construction. Windows throughout are generally of the mullioned variety.

Inside, a central hall plan is generally followed. The first floor features a formal entry hall with a central, open, two-flight stairway. To the right on the first floor is a large formal dining room, a breakfast room, two enclosed porches, a large pantry, and a kitchen. The dining room features a marble fireplace, wood-paneled walls, a pressed plaster ceiling with a Chinese Chippendale motif, sliding French doors, and the Ketterings' dining room furniture in the Louis XIV-XVI style. To the left on the first floor are the drawing room, a conservatory, a small bedroom, an enclosed porch, and a Lanai added after Kettering's death. The drawing room is decorated in much the same style as the dining room except that its ceiling has a flower motif.

(continued)

8 SIGNIFICANCE

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

SPECIFIC DATES 1914-1958 BUILDER/ARCHITECT Schenck and Williams

STATEMENT OF SIGNIFICANCE

Charles F. Kettering had more influence on the technological development of the automobile than perhaps any other individual. His development of the first successful electric starter in 1911, according to John B. Rae, one of the Nation's leading automotive historians, "was a major factor in promoting widespread use of the gasoline automobile, particularly because it made the operation of gasoline cars more attractive to women." In fact, says Rae, Kettering's device "may be regarded as the decisive factor in the triumph of the gasoline over the steam automobile."[1]

As head of the General Motors Research Corporation from 1920 to 1947, Kettering, according to historian Alex Groner, "pioneered the principle of the research team."[2] In 1922, a few years after his Dayton Engineering Laboratories Company (Delco) had become a division of General Motors, Kettering and Thomas H. Midgley achieved what Rae has described as "the outstanding single qualitative advance" in the improvement of gasoline by mixing tetraethyl lead with gasoline to reduce engine knock. One year later, Kettering "broke another major bottleneck in automobile production" by developing in cooperation with DuPont researchers a quick-drying automobile paint.[3] In the 1920's the refrigerant freon was developed under his direction. During the next decade he turned his attention to improvement of the diesel engine, and the two-cycle engine that came out of this research made possible the conversion of the Nation's railroads from steam to diesel power.

From 1914 until his death in 1958 Charles F. Kettering occupied this two-story house of stucco and half-timber construction, which is situated on a wooded, glacial moraine in semi-isolatation. Designed by the Dayton architectural firm of Schenck and Williams, it exhibits features of both Prairie style and Jacobethan architecture and overlooks Kettering Medical Center and College of Medical Arts

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[1]John B. Rae, The American Automobile: A Brief History (Chicago, 1965), 48.

[2]Alex Groner, The American Heritage History of American Business and Industry (New York, 1972), 276.

[3]Rae, The American Automobile, 90.

(946)

9 MAJOR BIBLIOGRAPHICAL REFERENCES

(See continuation sheet.)

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY circa 11 acres

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	16	740480	4397440
B	16	740740	4397450
C	16	740760	4397190
D	16	740500	4397180

VERBAL BOUNDARY DESCRIPTION

(See last page of 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

Ralph J. Christian, Historian, Historic Landmarks Project

ORGANIZATION — DATE

American Association for State and Local History — March 1977

STREET & NUMBER — TELEPHONE

1400 Eighth Avenue South — 615-242-5583

CITY OR TOWN — STATE

Nashville, — Tennessee 37203

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ 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

959

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

UNITED STATES DEPARTMENT OF THE INTERIOR
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At the top of the two-fight main stair is a pipe organ that Kettering installed for his wife. It still plays beautifully. The second floor features a centrally located open sitting room that is flanked on either side by bedrooms. To the right are three bedrooms including the master bedroom, which features exposed ceiling beams, a marble fireplace, a gigantic dressing room, and a large bath. On the left are two bedrooms and an enclosed porch that were used for guests. Most of the furnishings in these rooms as well as throughout the house belonged to Kettering.

Approximately 50 feet east of the house is a greenhouse and a combination garage and servants' quarters designed in the same style as the house. The one-story garage has spaces for four cars, features dark wood paneling, and has radiant steam heat. In the basement of this structure is the heating and cooling plant for the house as well as a tunnel connecting the two structures.

After Kettering's death in 1958, his son Eugene and his family occupied the house and made a number of alterations. The only major exterior change, however, was to the rear (west) facade. The porches in this section were enclosed and a huge polygonal Lanai was constructed. Inside, much of the original paneling was lightened, lighting fixtures were replaced, and the wooden stair rail replaced with one of wrought iron.

After Eugene Kettering's death in 1963, his widow donated the house to the Kettering Medical Center and College of Medical Arts. At present the residence is used for group meetings and a guest house, but plans have recently been announced by the Medical Center to convert a portion of it into a Kettering Memorial House Museum. It and its supporting structures are beautifully landscaped and carefully maintained.

Boundary Justification. The boundary described below includes the Charles F. Kettering House, the greenhouse, the garage, the upper portion of the approach drive, and the entire promontory upon which these features rest. The boundary is delineated in a circle because the house and outbuildings rest upon the nose of a rounded glacial moraine. The circle takes in the essential

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landscape of the house grounds and omits those outlying areas of the former Kettering estate that are somewhat separated from the house and that represent modern intrusions upon the former estate grounds.

Boundary Description: As indicated in red on the accompanying maps, [(1) U.S.G.S., 7.5' Series, Ohio, Dayton South Quad., 1966, photorevised 1964, and (2) AASLH Sketch Map, 1977], the boundary of the nominated property is described by a circle that is 800 feet in diameter and that has its center point at the midpoint of the Kettering House.

and much of the Great Miami Valley below. The house is only one of three known extant structures associated with Kettering, but it enjoys the longest and closest identification with him.

History

Charles Franklin Kettering was born August 29, 1876, on a farm near Loudonville, Ohio, to Jacob and Martha Hunter Kettering. Jacob had immigrated to the United States in the 1830's from Alsace-Lorraine and settled in Ashland County, Ohio, where he had became a relatively prosperous farmer and married Martha Hunter, who was of Scotch-Irish descent. At an early age, "Charlie" Kettering showed an interest in machinery, and before he was 9 years old, he had taken his mother's sewing machine apart and put it back together again to study its construction. A few years later, he purchased a telephone by mail simply to take it apart and learn how it worked.

After attending a one-room school near his home, Kettering entered Loudonville High School, from which he graduated in 1895. He taught in a country school for a year and then entered the College of Wooster but had to leave after the first term because of severe eyestrain. After another stint as a teacher, he entered Ohio State University in the fall of 1898 to study electrical engineering. Early in his sophomore year, however, his eye problems intensified, forcing him to leave school again. Kettering then went to work for the Star Telephone Company as a laborer on a line gang. Within a few months, he had recovered from his eye ailment and had been promoted to foreman of the line gang. In 1901 he returned to Ohio State and resumed his engineering studies. Meanwhile he supported himself by working as troubleshooter for the telephone company.

When Kettering was graduated in 1904, he accepted a position in the inventions department of the National Cash Register Company in Dayton. Here he came in contact with Edward A. Deeds, who was to have a significant impact on his future career. Kettering's first major contribution at National Cash Register was the development of the O.K. Charge Phone, which, by combining the telephone, the cash register, and a special magnetic stamping device, made it possible for a retail firm's central credit department to approve charge sales at the point of selling. Kettering also

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developed a low-cost printing cash register and an accounting machine for banks which had multiple counters and could subtract as well as add.

Kettering's major contribution to National Cash Register, however, was the electric cash register that he perfected in 1905 to replace the old hand-operated variety. Most electrical engineers of that era believed that an electric motor small enough to fit inside a cash register would not be powerful enough to run it, but Kettering, who, according to Rae, was to make "a career of technological unorthodoxy" took "particular pleasure in doing the things that would confound the experts."[4] Kettering solved the size problem by developing a different kind of electric motor, one which had to supply only a momentary burst of power. This motor, says Kettering biographer T. A. Boyd, had "extra high turning power for its size and a clutch for engaging the mechanism of the cash register and then releasing it at just the right time."[5]

By 1908 Kettering, with Deeds encouragement had begun to devote many of his off-hours to experimentation on automobile ignition systems. Most early automobiles had a dual dry battery and magneto ignition system, neither of which were very satisfactory. Working in a barn on Deeds' estate and assisted by a dozen or so fellow National Cash Register employees, soon called the "Barn Gang," Kettering devised a battery ignition system with a relay which gave one powerful spark for each contact of the distributor instead of the usual shower of sparks and thereby greatly extended battery life.

In 1909, shortly after several automobile manufacturers, including Henry M. Leland's Cadillac Motor Car Company, had placed orders for his ignition system, Kettering resigned his position with National Cash Register to devote his time to independent research. Later that same year he and Edward A. Deeds organized the Dayton Engineering Laboratories Company (later shortened to Delco). Deeds took charge of the business end of the operation while Kettering confined his talents largely to research and improving his ignition system.

(148)

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[4]John B. Rae, American Automobile Manufacturers: The First Forty Years (Philadelphia, 1959), 114.

[5]T. A. Boyd, Professional Amateur: The Biography of Charles Franklin Kettering (New York, 1957), 54.

While Kettering tinkered and experimented in Dayton, a sequence of events occurred which were to lead to his greatest triumph. In 1910 a friend of Henry M. Leland's died as a result of complications received while trying to crank a stalled car. (Many automotive historians have identified this individual as Byron Carter, inventor of the friction drive Cartercar, but he died 2 years earlier.) Deeply disturbed, Leland put the Cadillac engineering department to work on the problem, and they soon concluded, as had others before them, that an electric starter was the answer. The only problem, however, was that an electric motor to power such a starting device would have to be almost as large as the car's engine.

At this juncture, Leland, well aware of Kettering's success with the electric cash register, asked him to devise a small electric motor to power a starter. Working in the Deeds barn, Kettering developed an electric power unit with a high torque motor for cranking the engine and a generator to keep the battery charged. Kettering, says Boyd, "devised a 6-24 volt system which in the starting position operated at 24 volts but in the running position fed electricity back into the battery at 6 volts."[6] Demonstrated successfully on a Cadillac on February 27, 1911, Kettering's starting device was adopted as standard equipment on the 1912 Cadillac, and within a few years was adopted by most automobile manufacturers. Kettering's achievement marked a watershed in the development of the automobile. In the words of Rae,

> the electric starter was more than just a convenience or safety item. It was a major factor in promoting widespread use of the gasoline automobile, particularly because it made the operation of gasoline cars more attractive to women. In fact, the electric starter may be regarded as the decisive factor in the triumph of the gasoline over the steam automobile.[7]

(949)

The great demand for the starters forced Kettering and Deeds to change Delco from a research and development-oriented company

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[6] Ibid., 69.

[7] Rae, The American Automobile, 48.

to a manufacturing one, because electrical manufacturers refused to produce the starter as they had the ignition system. Kettering, however, concentrated on research and soon developed an electric headlight system. Later he turned his attention to other areas. He devised a small lighting plant, designed particularly for farmers which enabled them to generate their own electrical power, and during World War I, he successfully tested a pilotless airplane.

In 1916 when William C. Durant was organizing United Motors, he purchased Delco, thus bringing Kettering into the General Motors orbit. During the 1920's, thanks to Alfred P. Sloan, Jr., Kettering became the dominant figure in General Motors' research and development program. As head of the General Motors Research Corporation, Kettering, who "believed in working cooperatively with other engineers . . . pioneered," according to business historian Alex Groner, "the principle of the research team."[8]

Although he and his researchers failed in some endeavors, like their attempt to develop a copper-cooled engine, there were some rather spectacular breakthroughs. In 1922 he and Thomas H. Midgley achieved what Rae had described as "the outstanding single qualitative advance" in the improvement of gasoline by mixing tetraethyl lead with gasoline to reduce engine knock. One year later, Kettering "broke another major bottleneck in automobile production" by developing, in cooperation with DuPont researchers, a quick-drying automobile paint.[9]

As before, achievements were not confined to the automotive field. In the 1920's the refrigerant freon was developed under Kettering's direction. During the 1930's he turned his attention to improvement of the diesel engine, and the two-cycle engine that came out of this research made possible the conversion of the Nation's railroads from steam to diesel power.

In the course of his lifetime, Kettering obtained nearly 200 patents on his inventions and innovations and amassed a considerable fortune. Although he officially retired from General Motors in 1947, he continued to act as a consultant to the corporation until his death in Dayton on November 25, 1958, at the age of 82.

(950)

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[8]Groner, American Heritage History of American Business and Industry, 276.

[9]Rae, The American Automobile, 90.

Boyd, T. A., Professional Amateur: The Biography of Charles Franklin Kettering (New York: E. P. Dutton & Co., Inc., 1957).

"Charles Franklin Kettering," National Cyclopedia of American Biography, XLVIII (New York: James T. White & Company, 1963), 1-5.

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_____, The American Automobile: A Brief History (Chicago: Press, 1965).

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