General Inventory of Harvard University's Institute of Geographical Exploration 1933 Aerial Survey of Massachusetts Aerial Photographs, & other IGE Aerial Photographs

At the Harvard Forest Archives, Petersham,
March 11, 2020

Sean Fisher, DCR Archivist
July 2020

HARVARD FOREST ARCHIVES
Archives
322B
ENTRANCE

Over the course of 4 days in early May 1933, the relatively new Harvard Institute (aka School) of Geographical Exploration (IGE), in conjunction with the U.S. Army Air Corps, undertook the 1st ever aerial photo survey of an entire state, of Massachusetts.

The work was jointly led by aerial photographer Weld Arnold, of the IGE, and Lt. James F. Phillips, of the Army Air Corps.

Using a 5-lens camera, about 800 composite photographs were created, with 5 exposures each, totaling 4,000 images.

The work was highlighted in articles of Boston newspapers, including the *Boston Globe* and the *Christian Science Monitor*; and in a November 1933 issue of the *Popular Mechanics Magazine*.

Aerial photography from airplanes was first used for military purposes, during World War 1.

Non-military government and commercial aerial photography did not start until the 1920s. One of the early uses was by the MA state government, for the construction of the Quabbin Reservoir, and related water supply aqueduct. The agency, the Metropolitan District Water Supply Commission, hired an aerial photo survey company to make an aerial survey of the Swift, Ware and Chicopee River Watersheds in 1926-1927.

The 1st federal statewide aerial survey of Massachusetts was in 1938, through the U.S. Geological Survey.

The Harvard IGE was started in 1931, through private funds. The donor pulled the funds in 1951, and the IGE closed.

I have had a career-long fascination with aerial photography since the early 1990s.

During the 1990s, as the MDC Archivist, I located an index map of Massachusetts for the 1933 IGE survey in the MDC Archives, with the Swift, Ware, Wachusett, Sudbury, and Cochituate Reservoirs Watersheds highlighted in colors, and with a MDWSC Plans Accession No. on it. To me, the IGE had shared this index map and aerial photos of those watersheds with the MDWSC.

As the 1933 articles note, the prints "will be available . . . for such purposes as forestry work, engineering projects, construction work, city planning and projects of public interest."

In 2002, I located the IGE 1933 photo prints that it shared with the MDWSC in the Records Center of the Massachusetts Water Resources Authority (MWRA), the new state agency created in 1985 from the MDC Water Division. The MDC retained management of the water supply reservoirs (Quabbin, Wachusett, Sudbury), and the MWRA was given the water distribution function from these reservoirs.

I formally inventoried this same photo sub-set in the MWRA Records Center in February 2020.

Back in 2003, I made inquiries to the Harvard Map Collection asking about the whereabouts of the IGE's 1933 aerial photo survey of MA collection. The Director communicated that that specific collection had been missing for many years, after campus-wide searches through the years.

It was not until my visit to the Harvard Forest Archives on March 11, 2020 that I located another small portion from the 1933 IGE aerial survey of MA.

And, it was not until July 2020, while compiling this PowerPoint Report that I discovered online that the Harvard Collection of Historical Scientific Instruments holds a significant collection of IGE aerial survey photos and objects, including some photos from the 1933 survey.

The Cambridge Historical Commission also holds some prints from the 1933 IGE survey, which are also online.

Through examining additional aerial photos in the Harvard Forest Archives, and in the DCR Archives, and in DCR's archival collections at the Mass. State Archives, I have also determined that the IGE also used the letter 'H' as a prefix for a photo number, followed by 2 digits that reference year. For example, "H38" refers to a photo taken in 1938.

Harvard IGE Aerial Photos at HFA

IGE 1933 Aerial Survey of Massachusetts

16.25” x 15.75” prints (10)

- 251C
- 252C
- 253A
- 253C
- 253D
- 253E
- Plus 4 not numbered (299, 300, 344, 345?)

6” x 7” prints (4)

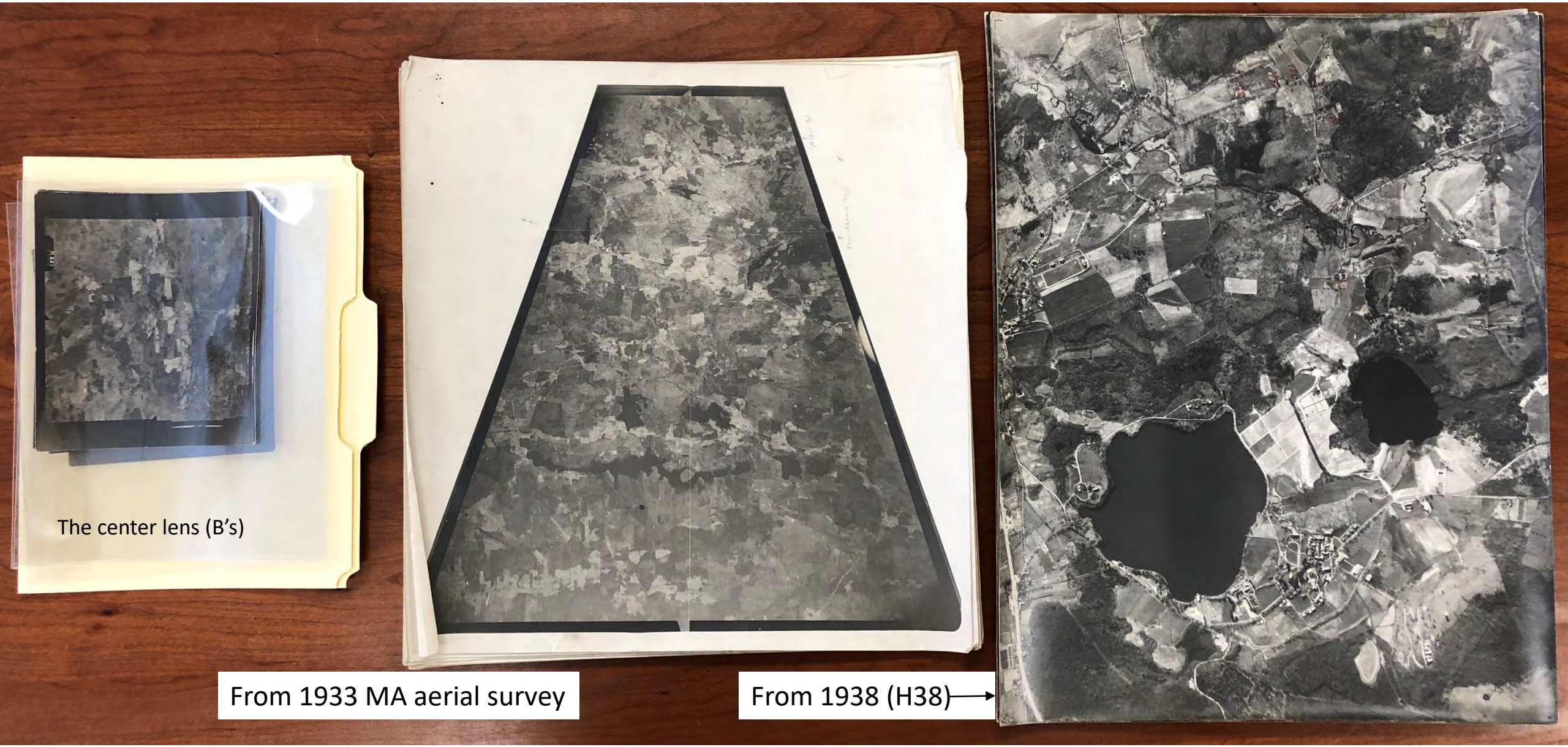
- 251B
- 253B
- 255B (2)

IGE 1938 & Undated Aerials (of MA?/Harvard Forest area?)

15.5” x 19.5” prints (8)

- No. H38-M-2_?
- No. H38-M-2_?
- Nos. 33-38 (6)

IGE Aerial Photographs in the Harvard Forest Archives



Photograph Number

Identification

Date

WARNING

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WHEN REPRODUCED
WATCH CREDIT LINE

INSTITUTE OF GEOGRAPHICAL EXPLORATION
HARVARD UNIVERSITY
2 DIVINITY AVENUE
CAMBRIDGE - MASSACHUSETTS

Thomas Barbour

Photograph Number B# 251

Identification

Date

WARNING

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CAMBRIDGE - MASSACHUSETTS

H38-M-21

H38-M-2

Photograph By

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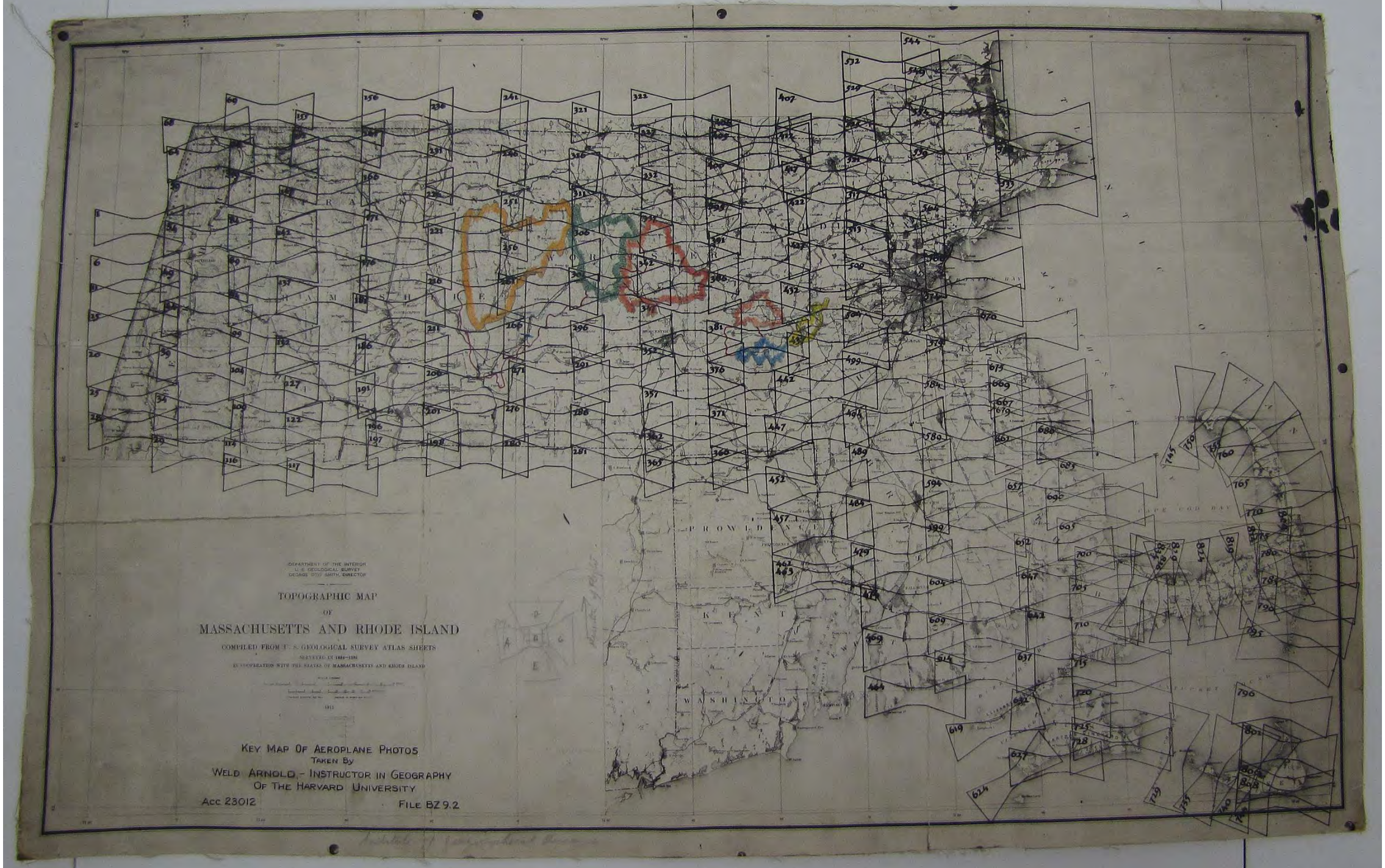
HARVARD UNIVERSITY

35

Photograph By

INSTITUTE OF
GEOGRAPHICAL EXPLORATION
HARVARD UNIVERSITY

Harvard IGE 1933 MA Aerial Survey Material in the DCR Archives


DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR
TOPOGRAPHIC MAP
OF
MASSACHUSETTS AND RHODE ISLAND
COMPILED FROM U. S. GEOLOGICAL SURVEY ATLAS SHEETS
IN COOPERATION WITH THE STATES OF MASSACHUSETTS AND RHODE ISLAND
1915
KEY MAP OF AEROPLANE PHOTOS
TAKEN BY
WELD ARNOLD, - INSTRUCTOR IN GEOGRAPHY
OF THE HARVARD UNIVERSITY
ACC 23012
FILE BZ 9.2
PROVIDENCE
KENT
WASHINGTON

DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

TOPOGRAPHIC MAP

OF

MASSACHUSETTS AND RHODE ISLAND

COMPILED FROM U. S. GEOLOGICAL SURVEY ATLAS SHEETS

SURVEYED IN 1884–1894

IN COOPERATION WITH THE STATES OF MASSACHUSETTS AND RHODE ISLAND

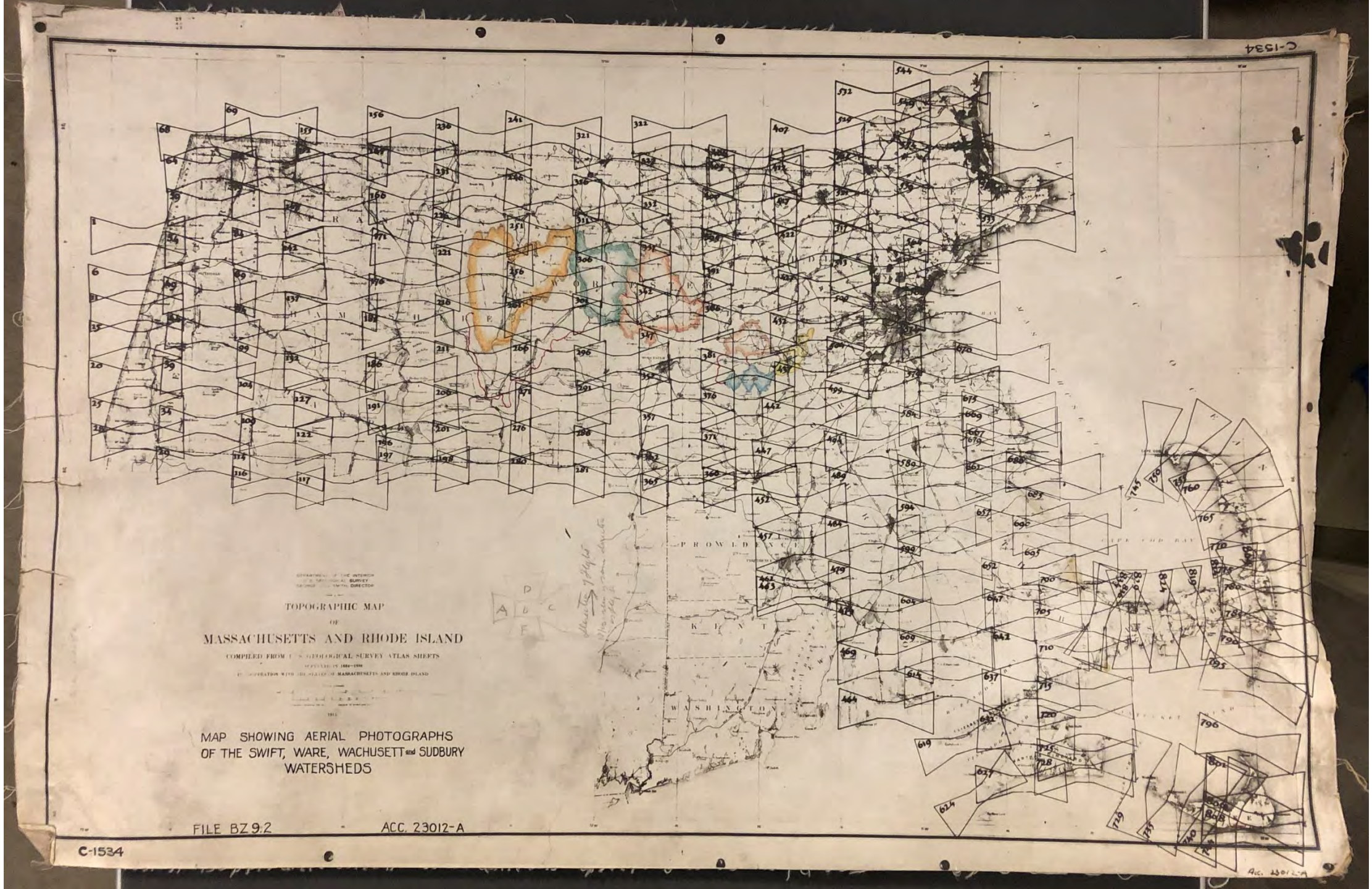
1919

KEY MAP OF AEROPLANE PHOTOS
TAKEN BY
WELD ARNOLD, - INSTRUCTOR IN GEOGRAPHY
OF THE HARVARD UNIVERSITY

ACC 23012

FILE BZ 9.2

Harvard IGE 1933 MA Aerial Survey Material in the
Massachusetts Water Resources Authority (MWRA),
Records Center, Marlborough,
February 2020, as surveyed by the DCR Archivist


C-1534
TOPOGRAPHIC MAP
OF
MASSACHUSETTS AND RHODE ISLAND
COMPILED FROM U. S. GEOLOGICAL SURVEY ATLAS SHEETS
MAP SHOWING AERIAL PHOTOGRAPHS
OF THE SWIFT, WARE, WACHUSETT and SUDBURY
WATERSHEDS
FILE BZ 9:2
ACC. 23012-A
C-1534

14”x21”

DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

TOPOGRAPHIC MAP

OF

MASSACHUSETTS AND RHODE ISLAND

COMPILED FROM U. S. GEOLOGICAL SURVEY ATLAS SHEETS

SURVEYED IN 1884—1888

IN COOPERATION WITH THE STATES OF MASSACHUSETTS AND RHODE ISLAND

SCALE 1:250000

Contour interval 100 feet Datum is mean sea level

1915

MAP SHOWING AERIAL PHOTOGRAPHS
OF THE SWIFT, WARE, WACHUSETT and SUDBURY
WATERSHEDS

FILE BZ 9.2

ACC. 23012-A

C-1534

16.25”x15”

Photograph Number 212-A

Identification

Date

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INSTITUTE OF GEOGRAPHICAL EXPLORATION
HARVARD UNIVERSITY
2 DIVINITY AVENUE
CAMBRIDGE - MASSACHUSETTS

N 212
AC 31-83-B

212

A,B,C

AERIAL PHOTOGRAPH OF WESTERN MASSACHUSETTS

TAKINGS 252 thru 280
LP-2-1
02-02
TAKINGS 282 thru 299
LP-2-2
02-03
TAKINGS 300 thru 320
LP-2-3
02-05
TAKINGS 321 thru

18” x 18” envelopes (stack = just under 3.5”)

About 135 Prints (16.25” x 15”; the center B’s are smaller in size)
No. Ranges 212-226, 249-263, 298-310, 336-346
All are A, B, C (3 prints per envelope), except

- 226: B, C
- 249: C
- 259: C
- 260-298: C (260, 261, 262, 263, 298)
- 299: B, C
- 310: A, C
- 336: C
- 337: C
- 338-341: B, C
- 346: C (envelope has a little water damage, from 2006 flood)

<u>Range Coverage</u>

- Swift/Ware River Watersheds (212-226, 249-263)
- Ware River/Wachusett Watersheds (298-310)
- Wachusett Watershed (336-346)

Background Research and Information Available Online

Boston Globe, May 13, 1933, p. 18

COMPLETE PHOTOGRAPH OF MASSACHUSETTS FINISHED

Every Bit of State Covered From Plane—To Be Basis of New Map, Much Needed

NEW YORK, May 12 (A. P.)—A complete photographic record of Massachusetts, made from 15,000 feet in the air, was announced today by the Institute of Geographical Exploration of Harvard University through 1st Lieut James F. Phillips.

Phillips said the exploit represented the first time that any state has been completely covered by aerial photograhpy.

Cartographers at the institute now are at work on a new map to be made from the photographs. It is expected the work will require approximately two years.

Weld Arnold of the Geographical Institute supervised the work and Phillips piloted. A new-type 5-lens camera, costing $12,000 to construct, was used. An area of 8039 square miles was photographed at a scale of two inches to the mile in a total flying time of 24 hours and 40 minutes. Composite photographs, of five exposures each, numbered 800.

Comparison of the photographs with existing maps of the state, Phillips said, exposed new roads, reservoirs, boundaries and other features that have never been mapped, and made need for a new map apparent. He expected the new map to be of great future value to forestry, engineering, city planning and other projects.

Boston Globe, June 7, 1933, p. 29

AERIAL MAP OF STATE REVEALS NEW FEATURES

An aerial photographic record of Massachusetts taken from a height of 15,000 feet under auspices of the Institute of Geographical Exploration of Harvard University will be used as the basis for a new map of the State. Massachusetts is the first State ever to have its complete photograph taken, the New England Council says in its bulletin.

Comparison of the aerial photographs, of which 800 were made at a scale of two inches to the mile, with existing maps of the State revealed new roads, reservoirs, boundaries and other features which had never been mapped. The new map, completion of which will take about two years more, is expected to be of great value to future forestry, engineering and town planning projects.

Christian Science Monitor, May 13, 1933, p. 3

Harvard Mapping Massachusetts By An Aerial Survey
Christian Science Monitor (1908-Current file): May 13, 1933; ProQuest
pg. 3

Harvard Mapping Massachusetts By An Aerial Survey

More Than 4500 Pictures Taken by Plane to Be Pieced Together

More than 4500 photographic prints of the State of Massachusetts are being pieced together at the Harvard Institute of Geographical Exploration to form the first complete aerial survey of an entire state. The area surveyed is the largest ever covered in a single project, according to announcement from University Hall.

In conducting the survey, the institute employed a new five-lens super-camera weighing 104 pounds. The central lens takes a vertical photograph and the four other lenses take oblique photographs. All five simultaneous pictures are then assembled into one composite picture in the form of a Maltese cross.

The scale of the map is one to thirty thousand, which reduces the State of Massachusetts to a composite picture 33 feet long by 22 feet wide. On this same scale the Harvard Stadium is about three-eighths of an inch in length.

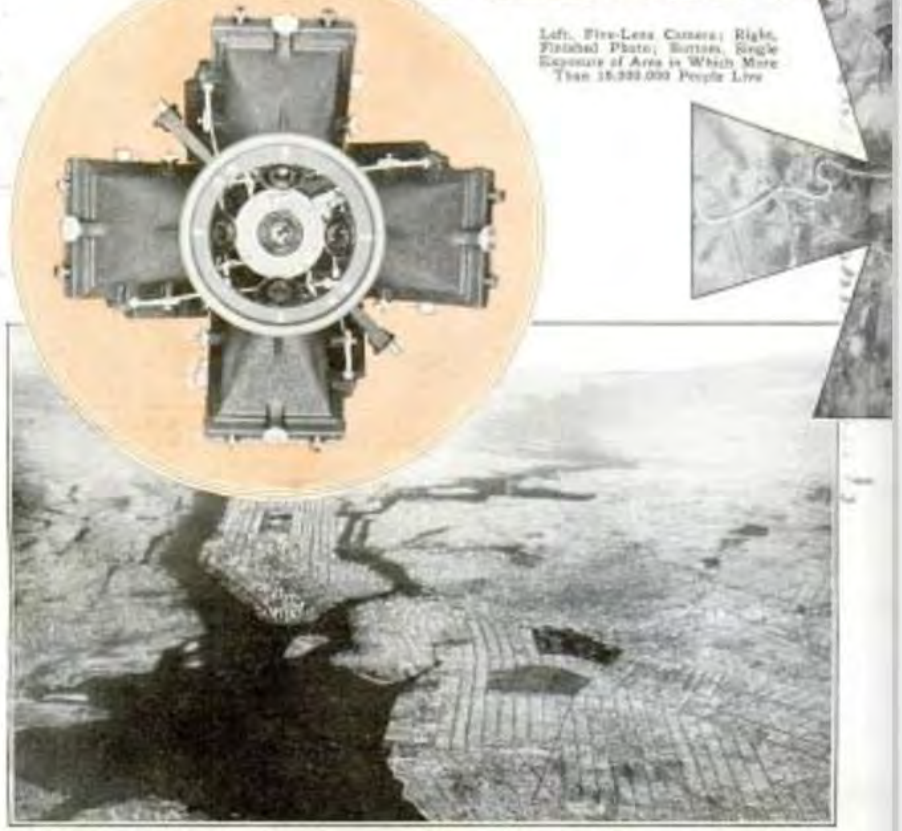
The camera is the result of 15 years' research and experimental work, with multiple lens photography. Maj. James W. Bagley of the Army Engineer Corps designed and built the first successful multiple lens camera using three lenses. This was subsequently developed into a four-lens camera, and finally into the present five-lens one used by the institute. It cost approximately $12,000 to construct. Watch makers took more than nine months to complete the camera because of the exactness and precision of measurement necessary.

Actual photography on the map project was done by Mr. Weld Arnold of the Geographical Institute. Lieut. James F. Philips of the United States Army piloted the plane. A total of 24 hours and 40 minutes flying time was devoted to the work in four days of actual flying.

Starting the first day from Boston the plane proceeded to the western edge of the State, flew from north to south, back and forth, across the State taking photographs at intervals of approximately one minute each which covered an area of about 15 miles. The plane flew at an altitude of 15,000 feet and covered an area of 8039 square miles.

The map was considered desirable at this time because of the need for an up-to-date record of new roads, town boundaries, reservoirs, ponds, and changes in terrain which do not appear on any of the existing maps. All photographs are the property of the institute but will be available when pieced together, for such purposes as forestry work, engineering projects, construction work, city planning and projects of public interest.

TEN MILLION *at one* SHOT



Left, Five-Lens Camera; Right, Finished Photo; Bottom, Single Exposure of Area in Which More Than 10,000,000 People Live

Courtesy U. S. Army Air Corps

By JULIAN LEGGETT

SHOOTING 10,000,000 people at one time is impossible for the most deadly engine of war but comparatively easy for a five-lens camera, actually five cameras in one, so constructed that highly accurate photographs can be made from an airplane flying thousands of feet high.

One example of its efficiency is a photograph of New York city and vicinity, in which some 10,000,000 people live. This snapshot was made from a United States army plane cruising 25,300 feet above the city in a temperature of fifty-one degrees below zero.

Military experts point out that such a camera is of great importance because only one photograph may be sufficient to accomplish the same end that meant hours of dangerous flying and scores of snapshots in the day of the single-lens camera. Aerial photography, from the commercial angle, actually has been revolutionized by this new camera. For the first time in history, it is possible to photograph an entire

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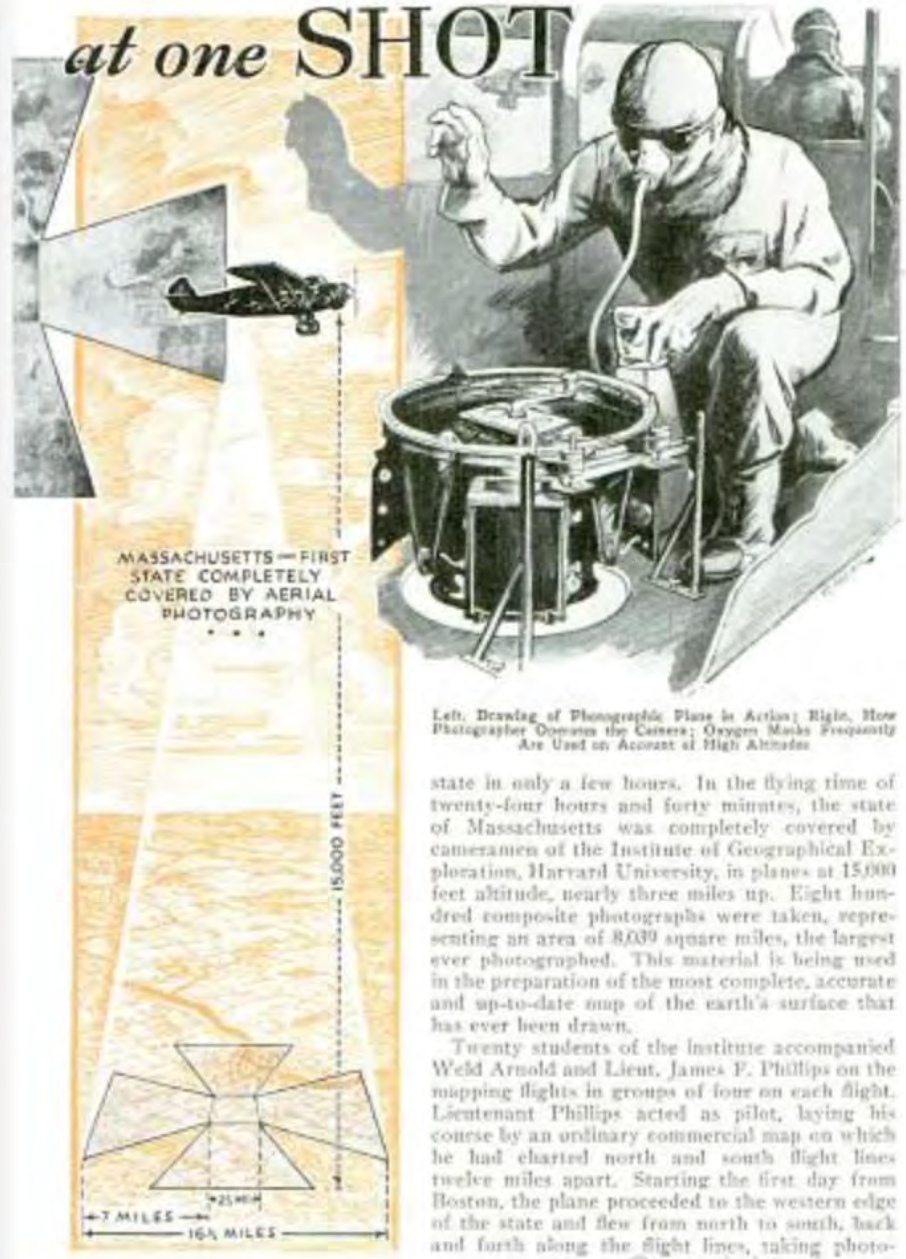

Left, Drawing of Photographic Plane in Action; Right, How Photographer Operates the Camera; Oxygen Masks Frequently Are Used on Account of High Altitudes

state in only a few hours. In the flying time of twenty-four hours and forty minutes, the state of Massachusetts was completely covered by cameramen of the Institute of Geographical Exploration, Harvard University, in planes at 15,000 feet altitude, nearly three miles up. Eight hundred composite photographs were taken, representing an area of 8,039 square miles, the largest ever photographed. This material is being used in the preparation of the most complete, accurate and up-to-date map of the earth's surface that has ever been drawn.

Twenty students of the Institute accompanied Weld Arnold and Lieut. James F. Phillips on the mapping flights in groups of four on each flight. Lieutenant Phillips acted as pilot, laying his course by an ordinary commercial map on which he had charted north and south flight lines twelve miles apart. Starting the first day from Boston, the plane proceeded to the western edge of the state and flew from north to south, back and forth along the flight lines, taking photo-

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Top and Bottom Photos, Courtesy Institute of Geographical Exploration, Harvard University

Top, Photo of Boston and Cambridge; Note Harvard Stadium (the White Oval); Right, End View of Camera; Bottom, Photo Along Atlantic Coast

graphs at the rate of one each minute. Approximately fifteen miles of the state was recorded each time the camera snapped.

It was obvious to the men in charge of the work that there was need for an up-to-date map of many sections as new roads, town boundaries, reservoirs and ponds did not appear on existing maps. The photographs are suitable for forestry work, engineering projects, construction work of various sorts, city planning, as well as for map-making. The scale is about one to 30,000, which would present Massachusetts as a photograph thirty-three feet long by twenty-two feet wide. However, the photographs do not represent a continuous mosaic, due to the fact that at 15,000 feet the center lens of the camera takes direct perpendicular pictures of a strip two and one-half miles wide, while the side lenses take a diagonal strip about six miles wide on either side, like the wings of a Maltese cross. In map work, the direct photographs can be pieced together in strips two and one-half miles wide, separated by seven-mile strips, which can be filled in from the wing photographs.

The five-lens camera is the further development of the tri-lens camera widely known by military authorities as the Bagley, invented by Maj. James W. Bagley some sixteen years ago. The latest camera is the result of fifteen years of guarded

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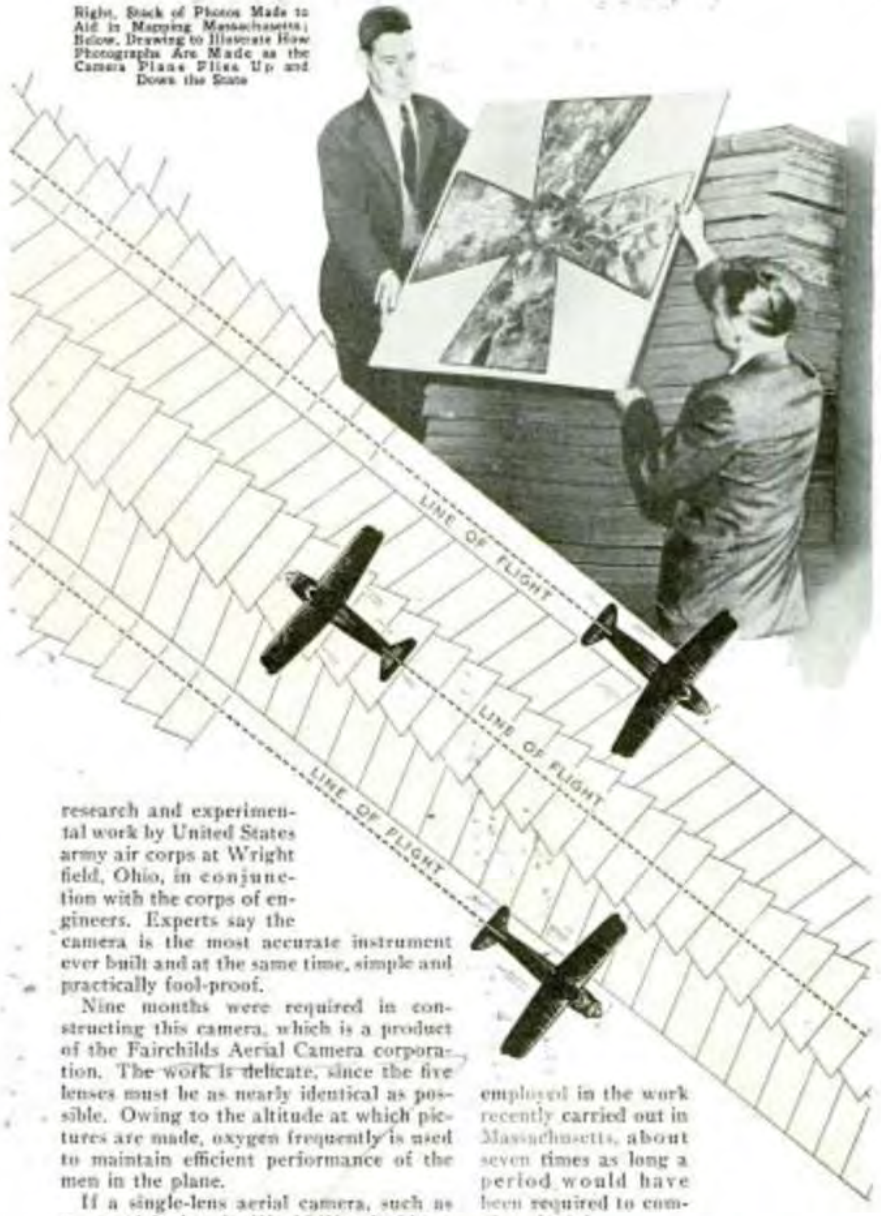
Right, Stack of Photos Made to Aid in Mapping Massachusetts; Below, Drawing to Illustrate How Photographs Are Made as the Camera Plane Flies Up and Down the State



research and experimental work by United States army air corps at Wright field, Ohio, in conjunction with the corps of engineers. Experts say the camera is the most accurate instrument ever built and at the same time, simple and practically fool-proof.

Nine months were required in constructing this camera, which is a product of the Fairchilds Aerial Camera corporation. The work is delicate, since the five lenses must be as nearly identical as possible. Owing to the altitude at which pictures are made, oxygen frequently is used to maintain efficient performance of the men in the plane.

If a single-lens aerial camera, such as was used during the World War, had been employed in the work recently carried out in Massachusetts, about seven times as long a period would have been required to complete the job.

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Popular Mechanics Magazine
REGISTERED IN U. S. PATENT OFFICE AND CANADA
WRITTEN SO YOU CAN UNDERSTAND IT

Vol. 60 NOVEMBER, 1933 No. 5

Julian Leggett, "Ten Million at One Shot," *Popular Mechanics Magazine*, Vol. 60, No. 5 (November 1933), pp. 658-661

Boston Globe,
April 16, 1934, p. 5

OPEN LECTURE ON AERIAL PHOTOGRAPHY AT HARVARD

An illustrated lecture on aerial photography as developed by the United States Army Air Corps will be given by Lieut James F. Phillips of Wright Field, Dayton, O, on Wednesday, April 18, at 8 p m. The lecture will be held in the Institute of Geographical Exploration at Harvard on Divinity av, off Kirkland st, and admission will be free to the general public.

Last year Lieut Phillips assisted Weld Arnold, director of the Institute, in photographing the entire State of Massachusetts from the air, and some of these pictures will be on view at the lecture.

Weld Arnold (1895-1962)

- Harvard, Class of 1918
- WW1 veteran

James F. Phillips (1900-1973)

Boston Globe, Oct. 8, 1962, p. 23

Weld Arnold Rites Today in Nevada

Services for Weld Arnold, 67, Nevada's first Civil Defense director and a former Harvard professor, will be held today in Carson City, Nev.

Mr. Arnold died Friday night in Carson City, where he was a resident 20 years.

During World War I, Mr. Arnold was an Army lieutenant and in World War II he was an Air Corps colonel.

He leaves a wife, Margaret; a son, Thomas, of Carson City and a daughter, Mrs. Mary Arnold Twining, of Storrs, Ct.

Boston Globe, Feb. 21, 1973, p. 41

James Phillips, ex-Cambridge general, dies

Services will be held at 1 p.m. Friday in Ft. Myer Chapel at Ft. Myer Heights, Arlington, Va., for Maj. Gen. (USAF-Ret.) James F. Phillips of Washington, D.C. He died Feb. 5 of a heart attack at his winter home in Las Palmas, Grand Canary Island, Spain.

He was a former commanding general of the Air Force Research Center in Cambridge and served as Air Force secretary of the Research and Development Board.

Gen. Phillips was born in Cambridge, Idaho, and was graduated from Iowa State University in 1922.

In the mid-1920s he entered the Air Corps Primary Flying School at Brooks Field, Tex., and in 1928 was graduated from the Air Corps Advanced Flying School at Kelly Field, Tex.

After an assignment of several years at Wright Field in Dayton, Ohio, he became an instructor of aerial photography and mapping at the Institute of Geographical Exploration at Harvard University.

During much of World War II he was chief of the materiel division in the Office of the Assistant Chief of Air Staff for Materiel and Supply. In August, 1945, he was named commanding general of the Philippines Air Materiel Area in Manila.

He leaves his wife, Marcella; two daughters, Dr. Laura Phillips of Los Angeles and Mrs. Ulric Weil of White Plains, N.Y.; a brother, George N. Phillips of Iowa; a sister, Mrs. Aaron Rowe of Missouri, and two grandchildren.

Burial will be in Arlington National Cemetery.

Boston Globe,
March 8, 1932, p. 2

AERIAL PHOTOGRAPHY LECTURES AT HARVARD

Aerial photography, one of the most important features of present-day warfare, will receive consideration at Harvard during the next six weeks when six Army officers, all experts in the subject, will give a series of 12 lectures at the new Harvard School of Geographical Exploration on Divinity av, Cambridge. The lectures will be illustrated and are open to the public.

The first lecture will be given this evening at 8 by Capt D. M. Reeves of the Army Air Corps, who is now stationed at the Wright Field, Dayton, O. Capt Reeves will speak tonight and Wednesday night on "Military Use of Aerial Photographs."

The remainder of the series of lectures will be given on Wednesday and Thursday evenings.

"No Dispute" Over Closing Harvard's $2 Million Institute

Doors were being closed today at Harvard's $2,000,000 Institute of Geographical Exploration on Divinity av., Cambridge, and its five-man staff discharged with nine months' pay.

After 20 years the world renowned map-making center, created and financed by a 76-year-old, Boston-born jungle explorer and millionaire scientist, was at an end.

Dr. A. Hamilton Rice, graduate of Harvard College (1898) and the Harvard Medical School (1904) and holder of a Harvard honorary degree (A. M., 1915), had withdrawn his support of the Institute and severed his connection with it.

From his Newport, R. I., estate he charged the University did not take a proper interest in geography and refused to cooperate in running the Institute. He also said higher income taxes would prevent further aid on his part without "sympathy" from the University.

Harvard itself, declining to argue with a former benefactor and an alumnus upon whom it had bestowed one of its famed honorary degrees, issued a carefully worked statement announcing Dr. Rice's withdrawal and declined further to amplify the statement.

Meanwhile it owned a roomy brick and granite building with a spacious amphitheatre, thousands of dollars worth of maps and scientific equipment, and no money and nobody to run it.

Transfer Classes

A spokesman said that the building would be closed pending a decision by Pres. Conant and the Harvard Corporation as to its future use. Records were being packed today, and arrangements made to transfer to other buildings classes which met in the Institute.

Dr. Rice and his first wife, the late Mrs. George B. Widener, presented the building and equipment to Harvard in 1931. Dr. Rice became its first director and a professor of geographical exploration.

The famed explorer of South American jungles and the widow of the wealthy Philadelphia financier, who went down on the Titanic, were married in Boston in 1915. The Widener family gave to Harvard the Widener Library, which serves as the center of the university's vast library system.

The first Mrs. Rice often accompanied her husband on his expeditions into the Amazon jungles. They were once attacked by cannibals.

She died several years ago, and Dr. Rice has since remarried. The present Mrs. Rice is the former Dorothy Farrington Upham.

Operated Separately

In announcing Dr. Rice's withdrawal of support, the University pointed out that the Institute was operated separately from the university although under its name. Dr. Rice paid the salaries of the staff and the operating expenses of the building and its research work in the field.

His contribution was between $25,000 and $30,000 a year.

There are five regular staff members, including two lecturers who give Harvard courses, affected by the closing of the building. Both the university and Dr. Rice said that their salaries have been paid to the end of the academic year in June.

Erwin Raisz and Edward S. Wood Jr. gave the lectures in map making and geographical exploration. Raisz said that the "shutdown was regarded with the greatest regret."

"Cartography is very important, especially for those students entering the armed forces," he said.

The amphitheatre in the building was a popular hall for the showing of movies and for evening speakers.

Legal counsel for Dr. Rice said that there was "no dispute" and "no misunderstanding" between the doctor and the university. The building, it was explained by both parties, belongs to Harvard.

Boston Globe, Oct. 9, 1951, p. 25

Jays
BOSTON
WELLESLEY

OPEN
WEDNESDAY
EVENING
in Boston

Friday Eve. in Wellesley

The Harvard Crimson

University Takes Charge of, Closes Geographic Institute

Millionaire Rice Halts Support; Wife Hits University Handling

By Michael J. Halberstam

October 2, 1951

The University yesterday took possession of and immediately closed the Institute of Geographic Exploration on Divinity Street, after multi-millionaire Dr. A. Hamilton Rice '98 ended his financial support of the building which he built and headed.

Mrs. Elizabeth Rioe, wife of the 76 year-old explorer, last night charged the University with acting in an "ungracious and coldblooded manner during the whole affair." She said her husband has spent almost 82 million in his single-handed support of the Institute.

Provont Buck last night said, "I cannot comment on Mrs. Rice's statements."

Students Stranded

The sudden closing of the 21-year old building means that two courses given by Institute members will be discontinued and that other courses, including Anthropology in, which meet in the lecture room must be moved.

What will be dose with the modern red brick building will be decided in the

From: David Cobb [cobb@fas.harvard.edu]
Sent: Friday, September 26, 2003 2:00 PM
To: Fisher, Sean (MDC)
Subject: Harvard Aerial Photo's

Sean -

Reference is made to your letter of 19 September. The short answer to your letter is that we don't have them.

The long answer is that we don't know where they are either. Several years ago we initiated a search around the campus hoping to locate a collection of aerial photographs that was reported to be nearly 150,000 and found a small cache of photo's for Cape Cod. I have just examined those photo's and the numbering does not match your accompanying index but I suspect they are from a similar period and we know that it was compiled by Harvard's Institute of Geographical Exploration. They are of the same size you describe and certainly predate the development of the Cape.

Unfortunately, this is all that is left of that collection. We know that many of the geographers went to BU after the Geography Dept. closed at Harvard and have also checked there with no success. We know that faculty also went to Columbia, Cornell, and Florida but have not pursued those avenues assuming limited success at reclaiming the materials even if found.

I'm sorry that I cannot be more positive and it is very unfortunate that this material seems to be lost as it would prove to be extremely valuable historical information.

David Cobb

A history of the Harvard Map Collection posted online by the HMC in 2003 notes that when the IGE closed, 90,000 sheet maps were transferred to the HMC. This history also notes that the HMC collections were surveyed in 1962.

Connecticut State Library Online Guide to Its Statewide Aerial Photographs Collections

libguides.ctstatelibrary.org/hg/aerialphotos/history

- 1985 Aerial Survey
- 1990 Aerial Survey
- 1995 Aerial Survey
- 2000 Aerial Survey
- History of Aerial Photography in Connecticut
- Report on the State Library Scanning Projects: Aerial Surveys of Connecticut

The 1934 Aerial Survey Project: a Tool for State Planning

Governor Wilbur L. Cross recommended an aerial survey of the entire state of Connecticut to the State Planning Board in 1933. The governor and the board saw such a survey as an essential tool in planning for the state's future. Dr. Charles G. Chakerian, director of the Board, said "The Water, Tax, Health, Highway and other departments had wanted one for years." (Hartford Daily Courant Mar. 31, 1935) The survey would be the first government sponsored aerial survey of an entire state. (The Institute of Geographical Exploration at Harvard University conducted an earlier survey of Massachusetts, the first of an entire state. These photographs can not be found today.)

Fairchild Aerial Surveys, Inc. of New York City, an innovator in aerial photography and aviation, conducted the aerial photography for Connecticut's survey. The result was thousands of individual photographs, which were pieced together to make a massive mosaic view of the state.

Governor Cross organized the State Planning Board in late 1933 and the first board statement was issued on January 8,

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69 photo items; plus objects such as cameras, etc.

Institute of Geographical Exploration

1929 - 1952

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Alexander Hamilton Rice was a geographer and explorer with two Harvard degrees (A.B. 1898, M.D. 1904), who specialized in rivers. It was said of him that he knew headwaters as other men knew headwaiters. In 1915, Rice married Eleanor Elkins Widener, a survivor of the Titanic, whose money had given Harvard its Widener Library.

In 1929, Rice offered to build Harvard an Institute of Geographical Exploration at 2 Divinity Avenue if in return he was named its director and appointed a professor. The Harvard Corporation and President Lowell agreed to this deal.

In 1948, Harvard President James B. Conant declared that geography was not a proper subject for the university, and closed the Geography Department. In anger, Rice withdrew his support of the Institute and the university closed it down in 1952. The Harvard-Yenching Institute and Department of East Asian Languages and Civilizations took over the building around 1957.

+Fairchild T-3A five-lens aerial camera system

Date: 1930-1936

Inventory Number: RS0385

Classification: Aerial Camera

Subject: geography, photography, cartography, aviation

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Fairchild Aviation Corporation (1927 - 1944)

User: United States Army Air Forces (1941-1947)

User: Institute of Geographical Exploration (1929 - 1952)

Cultural Region: United States

Place of Origin: New York

Dimensions: 162.6 x 167.6 x 139.7 cm, 100 lb. (64 x 66 x 55 in., 45.4 kg)

Material: glass, metal, brass

Accessories: trunks

Bibliography: The Fairchild Model T-3A Five Lens Aerial Camera and Model B-7 Transforming Printer
Multiple-Lens Aerial Cameras in Mapping

Description:
RS0385 is a Fairchild five-lens aerial camera, model T-3A, circa 1932 and its structural supports, film magazines, and printer in various storage trunks.

Described as a Maltese-cross-shape, made up of 5 prints (5 lenses)

mounted Fairchild T-3A aerial photograph, Plymouth, MA

Date: 1933

Inventory Number: RS1522c

Classification: Photograph

Subject: geography, photography, cartography, aviation

Maker: Institute of Geographical Exploration (1929 - 1952)

Maker: United States Army Air Forces (1941-1947)

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Eastman Kodak Company (1881-present)

Cultural Region: United States

Place of Origin: Cambridge

Dimensions: board, approx.: 86.3 x 86.1 cm (34 x 33 7/8 in.)

Material: paper, cardboard, cardstock, photographic paper

Description:
Large, Maltese-cross-shaped, black-and-white aerial photograph mounted on heavy cardstock. Photographic paper is likely Eastman Kodak Company P. M. C. Bromide double weight paper.

In the upper left corner, in blue crayon, the card reads:

JUST SOUTH OF/ PLYMOUTH, MASS. / ALTITUDE 2,500 FEET / 1933 MAY 4 / PILOT: 1ST LT. J. F. PHILLIPS / OBSERVER: WELD ARNOLD/

SCALE 1: 5,000 (approx)

JUST SOUTH OF
PLYMOUTH, MASS.
ALTITUDE 2,500 FEET
1933 MAY 4
PILOT: 1ST LT. J.F. PHILLIPS
OBSERVER: WELD ARNOLD
SCALE 1:5,000 (approx)
PICTURE IS
ABOUT 2½ MILES IN WIDTH
NORTH

mounted Fairchild T-3A aerial photograph, Springfield, Conn. River Valley, MA

Date: circa 1933

Inventory Number: RS1522d

Classification: Photograph

Subject: geography, photography, cartography, aviation

Maker: Institute of Geographical Exploration (1929 - 1952)

Maker: United States Army Air Forces (1941-1947)

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Eastman Kodak Company (1881-present)

Cultural Region: United States

Place of Origin: Cambridge

Dimensions: board, approx.: 86.3 x 86.1 cm (34 x 33 7/8 in.)

Material: paper, cardboard, cardstock, photographic paper

Description:
Large, Maltese-cross-shaped, black-and-white aerial photograph mounted on heavy cardstock. Photographic paper is likely Eastman Kodak Company P. M. C. Bromide double weight paper.

In the upper left corner, in blue crayon, the card reads:

SPRINGFIELD AND / CONN. RIVER VALLEY / FROM ALTITUDE OF / 15,000 FEET / SCALE / 1; 30,000 (approx)

In the upper right corner, in blue crayon, is written: PICTURE IS 15 MILES / ACROSS.

There is an arrow indicating NORTH.

In lower left corner, the "SOUTH HADLEY FALLS" are called out in the photo.

Images (3)

mounted 3-lens Fairchild T-3A aerial photographs, Cambridge, Boston, MA

Date: 1930-1939

Inventory Number: RS1530

Classification: Photograph

Subject: geography, photography, cartography, aviation

Maker: Institute of Geographical Exploration (1929 - 1952)

Maker: United States Army Air Forces (1941-1947)

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Eastman Kodak Company (1881-present)

Cultural Region: United States

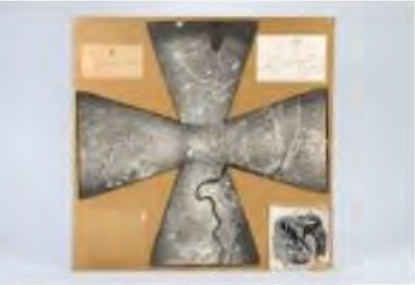
Place of Origin: Cambridge

Dimensions: board, approx.: 86.3 x 86.1 cm (34 x 33 7/8 in.)

Material: paper, cardboard, cardstock, photographic paper

Description:
This square board contains two bow-tie-shaped aerial photographs of Cambridge, Boston, and the vicinity. They are secured to the board with cellophane tape. Each has a typed caption. Between them are two pages detailing the mission to photograph the entire state of Massachusetts.

Images (5)



mounted Fairchild T-3A aerial photograph, Cambridge, MA

Date: 1930-1939

Inventory Number: RS1510

Classification: Photograph

Subject: geography, photography, cartography, aviation

Maker: Institute of Geographical Exploration (1929 - 1952)

Maker: United States Army Air Forces (1941-1947)

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Eastman Kodak Company (1881-present)

Cultural Region: United States

Place of Origin: Cambridge

Dimensions: board, approx.: 86.3 x 86.1 cm (34 x 33 7/8 in.)

Material: paper, cardboard, cardstock, photographic paper

+ Description

Images (14)

mounted Fairchild T-3A aerial photograph, Cape Cod, MA

Date: 1930-1939

Inventory Number: RS1514

Classification: Photograph

Subject: geography, photography, cartography, aviation

Maker: Institute of Geographical Exploration (1929 - 1952)

Maker: United States Army Air Forces (1941-1947)

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Eastman Kodak Company (1881-present)

Cultural Region: United States

Place of Origin: Cambridge

Dimensions: board, approx.: 86.3 x 86.1 cm (34 x 33 7/8 in.)

Material: paper, cardboard, cardstock, photographic paper

Description:
Large, Maltese-cross-shaped, black-and-white aerial photograph mounted on heavy cardstock. An extra pie-shaped wedge is attached. Photographic paper is likely Eastman Kodak Company P. M. C. Bromide double weight paper.

The area covered by this image is the tip of Cape Cod, MA.

The board is stamped in each corner with a label giving credit to the Institute of Geographical Exploration.

Images (4)

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-36

Date: 1930-1939

Inventory Number: RS1521a

Classification: Photograph

Subject: geography, photography, cartography, aviation

Maker: Institute of Geographical Exploration (1929 - 1952)

Maker: United States Army Air Forces (1941-1947)

Maker: Fairchild Aerial Camera Corporation (1920 - 1927)

Maker: Eastman Kodak Company (1881-present)

Cultural Region: United States

Place of Origin: Cambridge

Dimensions: board, approx.: 86.3 x 86.1 cm (34 x 33 7/8 in.)

Material: paper, cardboard, cardstock, photographic paper

Description:
Large, Maltese-cross-shaped, black-and-white aerial photograph mounted on heavy cardstock. Photographic paper is likely Eastman Kodak Company P. M. C. Bromide double weight paper.

The area covered by this image is identified on the reverse of the board by David P. Wheatland as Topsfield and Pingree Farm in northeastern Massachusetts.

The photographs are part of a series taken on a single flight, and are marked on the negatives: H36-5.

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mounted Fairchild T-3A aerial photograph, Columbus, OH
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, D-23
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-36
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-37
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-38
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-38
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-39
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-39
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-41
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-40
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-42
Institute of Geographical Exploration
1930-1939

mounted Fairchild T-3A aerial photograph, eastern MA, H36-5-43
Institute of Geographical Exploration
1930-1939

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Multiple-Lens Aerial Cameras In Mapping . . .
Fairchild Aerial Camera Corp.

A view of Cambridge, taken from a height of 15,000 feet by the Harvard Institute of Geographical Exploration as part of its aerial survey of Massachusetts, the first project of this type ever undertaken

Item Information

Title:	A view of Cambridge, taken from a height of 15,000 feet by the Harvard Institute of Geographical Exploration as part of its aerial survey of Massachusetts, the first project of this type ever undertaken
Photographer:	Harvard University. Institute of Geographical Exploration
Name on Item:	Photo taken by the Harvard Institute of Geographical Exploration
Date:	May 12, 1933
Format:	Photographs
Genre:	Photographic prints Aerial photographs
Location:	Cambridge Historical Commission
Collection (local):	Cambridge Photo Morgue Collection
Series:	Aerial Views
Subjects:	Universities & colleges Cities & towns Rivers Harvard University
Places:	Massachusetts > Middlesex (county) > Cambridge
Extent:	1 photograph : print ; sheet 26 x 21 cm (8 x 10 format)
Permalink:	https://ark.digitalcommonwealth.org/ark:/50959/wd377892k

Tools

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Cite

1 location mapped

Title	Records of the Institute of Geographical Exploration, 1932-1951
Author / Creator	Harvard University. Institute of Geographical Exploration. ›
Description	28 containers
Series / collection	Collections of the Harvard University Archives. University records ›
History note	The Institute of Geographical Exploration was established to train geographers in quantitative geography to supplement instruction in the Department of Geology and Geography.
Language	lang.eng
Notes	Access may be restricted. Details available at the repository.
Subjects	Rice Alexander Hamilton -- 1875-1956. › Harvard University. -- Institute of Geographical Exploration. › Harvard University -- Libraries. › Byrd Antarctic Expedition (2nd : 1933-1935) › Scientific expeditions. › Geography -- Study and teaching (Higher) ›
Keyword	Harvard University - Geography.
Form / genre	Specifications. ›
Contents	General correspondence of Director Alexander Hamilton Rice arranged alphabetically, 1932-1951 (17 boxes) UAV 461.5 -- Telegrams to and from the Byrd Expedition to Little America, 1934 (1 folder) UAV 461.434 -- Course records: contains grades, examination material, and working papers from various geography courses, 1932-1951 (4 boxes) UAV 461.214 -- Library records: Record of library acquisitions, 1934-1951 and Library charging records (book loans), 1934-1950 (1 volume) UAV 461.150.2 -- Forms, form letters, and notices (1 folder) UAV 461.229 -- Miscellaneous (1 folder) UAV 461.255 -- Visitors' Book, Oct. 1932-Jan. 1951 (1 volume) UAV 461.291 -- Specifications of School of Geography, 1930 (1 folder) UAV 461.430 -- Collections of Printed Material in the Institute of Geographical Exploration, by R. H. Maynes, Oct. 31, 1951 (1 folder) UAV 461.451.
Creation Date	1932
HOLLIS number	990006040450203941
Permalink	http://id.lib.harvard.edu/alma/990006040450203941/catalog

Title	General information by and about the Harvard University Institute of Geographical Exploration
Author / Creator	Harvard University. Institute of Geographical Exploration. ›
History note	The Institute of Geographical Exploration was established to train geographers in quantitative geography to supplement instruction in the Dept. of Geology and Geography.
Summary	May contain pamphlets, press accounts, and ephemera.
Language	English
Subjects	Harvard University. -- Institute of Geographical Exploration. ›
HOLLIS number	990085452230203941
Permalink	http://id.lib.harvard.edu/alma/990085452230203941/catalog

Title	Diary of Weld Arnold, 1932-1936
Author / Creator	Arnold, Weld, 1895-1962. ›
Finding aids	Unpublished shelflist available in repository.
Description	1 volume.
Series / collection	Collections of the Harvard University Archives. Faculty archives › Collections of the Harvard University Archives. Personal archives ›
History note	Arnold (Harvard, A.B., 1918) taught geography at Harvard.
Language	English
Notes	Gift of Institute of Geographical Exploration, 1955.
Subjects	Arnold Weld -- 1895-1962. ›
Keyword	Harvard University - Geography.
Form / genre	Diaries. ›
Creation Date	1932
HOLLIS number	990006044530203941
Permalink	http://id.lib.harvard.edu/alma/990006044530203941/catalog

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Collection Summary

Title	James Frederick Phillips papers
Dates (Inclusive)	1933-1971
Creator	Phillips, James Frederick
Abstract	Papers of a civil engineer, military pilot, and expert at aerial mapping and photography.
Collection Number	05802
Size	0.45 cubic ft. (1 box)
Repository	University of Wyoming. American Heritage Center.
Language(s)	English

Biography of James Frederick Phillips

James F. Phillips (1900-1973) graduated from University of Iowa in 1922 with a bachelor of science degree in civil engineering. Due to his high scholastic standing, he received an honor appointment as a Regular Army officer in the Corps of Engineers in 1923. His first assignment with the Army was at Fort Humphreys, Va., where he graduated from the Engineer School in 1924. He transferred to Fort Dupont, Del., and in 1926, joined the 11th Engineers at Corozal, Panama Canal Zone. Interested in aerial mapping and photography, Phillips graduated in 1928 from the Air Corps Advanced Flying School at Kelly Field, Texas, with the ratings pilot and observer. He then joined the Seventh Bombardment Group at Rockwell Field, Calif., and in February 1929, went to Wright Field, Ohio, where he conducted experimental work in aerial mapping and photography. During 1931-1932, he did high altitude and long-range photography and in the spring of the following two years taught aerial photography and mapping at Harvard University. In 1934, Phillips transferred from the Corps of Engineers to the Air Corps and entered the Air Corps Engineering School at Wright Field, OH, from which he graduated in June 1935. During the summer of 1934 and the fall of 1935, he was on detached service on the Air Corps-National Geographic Stratosphere Balloon Flights at Rapid City, SD. In February 1936, Phillips went to the Philippine Islands as commanding officer of the Second Observation Squadron and the Sixth Photo Section at Nichols Field. He later served in the office of the military attaché at Tokyo, when he made a special inspection of all Japanese industrial aircraft installations and aeronautical research facilities. In May 1937, he was assigned to the Chemical Warfare Service Research and Development Station at Edgewood Arsenal, MD. In July 1938, he became station technical inspector and station engineer officer at Kelly Field, Texas. Phillips entered the Air Corps Tactical School at Maxwell Field, AL, in September 1930, and graduated three months later. He then became assistant to the chief of the Engineering Section, Office of the Chief of the Air Corps. In May 1944, he became a liaison officer with the National Defense Research Committee and the National duties. He later served as chief of the Materiel Division in the Office of the Assistant Chief of Air Staff for Materiel and Supply. Phillips went to the Philippine Islands in August 1945, as commanding general of the Philippine Air Materiel Area, with station at Nichols Field. He became assistant chief of staff for materiel of the Pacific Air Command at Tokyo, Japan, in September 1946. In March 1947, Phillips was named assistant chief of the Procurement Group of the Army General Staff. The following December he was appointed Air Force secretary of the Research and Development Board of the Department of Defense. In August 1951, he assumed command of the Air Force Cambridge Research Center, Cambridge, Mass. After retiring from the military in 1953, he served as director of the Missile and Space Council of the Aerospace Industries Association of America, Inc. until 1962. He also was a member of the Air Training Advisory Board until 1965.

Scope and Content

The collection contains correspondence (1933-1953), including letters from individuals prominent in government and the military; memoranda and reports; citations and awards; and related material regarding Phillips' military career. Included are awards of merit, certificate of retirement, official statements, pay records, special orders, statement of service, and other. There is a course outline and notes for courses on aerial mapping taught by Phillips and newspaper articles regarding mapping, aerial projects, and related events concerning Phillips. Also included are biographical information and a transcription of a tape recording by Phillips, "Childhood Memories" (1971).

Additional Background Resources/Bibliography

"The Harvard School of Geography," *Science*, Vol. 72, No. 1864 (September 19, 1930), pp. 288-289

Neil Smith, "Academic War over the Field of Geography: The Elimination of Geography at Harvard, 1947-1951," *Annals of the Association of American Geographers,* Vol. 77, No. 2 (June 1987), pp. 155-172

"A Nod to Ham Rice," *Harvard Magazine* (March 1999) https://www.harvardmagazine.com/1999/03/jhj.ham.html