

MASCA - Froelich Rainey and Elizabeth Ralph records

0067

Finding aid prepared by Larry Rosen Jody Rodgers.

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University of Pennsylvania, Penn Museum Archives

2/28/2017

Table of Contents

Summary Information.....	3
Biography/History.....	3
Scope and Contents.....	4
Administrative Information.....	4
Controlled Access Headings.....	5
Collection Inventory.....	7
Correspondence.....	7
Elizabeth Ralph.....	12
Administration.....	13
Publicity.....	14
Grants/Proposals.....	14
Projects.....	18
Publication.....	21
Photographs.....	23

Summary Information

Repository	University of Pennsylvania: Penn Museum Archives
Creator	Rainey, Froelich, Director of the University Museum
Creator	Ralph, Elizabeth K., 1911-2000
Title	MASCA - Froelich Rainey and Elizabeth Ralph records
Call number	0067
Date [inclusive]	1953-1981
Extent	4.4 linear feet
Language	English

Biography/History

The Museum Applied Science Center for Archaeology (MASCA) was established in 1961 by a grant from the National Science Foundation. MASCA was modeled after the Research Laboratory for Archaeology and the History of Art at Oxford. From the time of its inception in 1961, MASCA, along with the Radiocarbon Laboratory at the Penn Museum made a number of contributions to radiocarbon dating, including, but not limited to, breakthroughs in recalibration and dendrochronology.

Elizabeth Ralph of the University Physics Department was named associate director of MASCA in 1962 following her tenure as a research assistant in the Carbon-14 laboratory.

Elizabeth Katherine Ralph, a life-long resident of the Trenton N.J. area was born in 1921. She attended Wellesley College, receiving her B.A. degree in chemistry in 1942. Ralph began a career in industry following graduation. She worked her way up to management as an electrical and chemical engineer. In 1949, Ralph began her master's program at the University of Pennsylvania majoring in Physics and

Geology.

Ralph followed in the footsteps of a pioneer in radiocarbon dating, Willard F. Libby of the University of Chicago. The development of the "new" (5730) half-life led, more recently, to the "calibration" of C-14 measurements with the help of precisely dated tree rings. She has been a leader in archaeological surveying, improving the sensitivity of the instruments to variations in magnetic intensity. Under her direction, MASCA's C-14 laboratory acquired an international reputation for excellence by processing hundreds of measurements from all over the world while constantly evaluating such methodological issues as inter-laboratory calibration and the "radiocarbon calendar."

Elizabeth Ralph published extensively and generously presented at conferences, seminars and local meetings. Her generosity also extended to students whom she trained. Dr. Ralph received the AIA Pomerance Award for Scientific Contributions to Archaeology in 1986 for being "a scientist of the loftiest standards and a human being of patience, fairness, and good humor. With great pride and gratitude for her many contributions to the growth and development of archaeology as an interdisciplinary science, we honor her today with the Pomerance Award of the Archaeological Institute of America for Scientific Contributions to Archaeology."

The Radiocarbon Laboratory and MASCA have collaborated with a number of prestigious institutions including the Lerici Foundation in Rome, the Tree Ring Laboratory in Tucson and the Research Laboratory for Archaeology and History of Art at Oxford. The Radiocarbon Laboratory was dissolved in 1982, upon the retirement of Dr. Ralph. MASCA was not terminated until 26 years later in 2008.

Scope and Contents

The Museum Applied Science Center for Archaeology (MASCA) was established in 1961 by a grant from the National Science Foundation. MASCA was modeled after the Research Laboratory for Archaeology and the History of Art at Oxford. From the time of its inception in 1961, MASCA, along with the Radiocarbon Laboratory at the Penn Museum made a number of contributions to radiocarbon dating, including, but not limited to, breakthroughs in recalibration and dendrochronology.

Elizabeth Ralph of the University Physics Department was named associate director of MASCA in 1962 following her tenure as a research assistant in the Carbon-14 laboratory.

The MASCA collection is housed in twelve archival boxes and incorporates the files of Elizabeth Ralph. Original processing of the records was interrupted due to illness but included grouping the files into series and individual items into chronological and alphabetical order. Later refinements included adjustments to the series and the addition of the files of Elizabeth Ralph. These files held personal correspondence, her dissertation, memberships and activities.

The correspondence, projects and publication series contain the vast amount of the collection data. The projects are arranged by type and then by location in alphabetical order. Of the total projects there are only two folders related to thermoluminescence, the majority to the use of the magnetometer.

Publications by the staff of Masca are arranged in date order from 1960 to 2005.

Administrative Information

University of Pennsylvania, Penn Museum Archives

2/28/2017

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Controlled Access Headings

CORPORATE NAME(S)

- MASCA research papers in science and archaeology .

GEOGRAPHIC NAME(S)

- Alaska
- Gordion (Extinct city)
- Guatemala
- Italy
- Japan
- Mexico

PERSONAL NAME(S)

- Aitken, Martin J., b.1922
- Bevan, Bruce W.
- Coe, Michael D., 1929-
- Haury, E.W., 1904-1992
- Iskander, Zaki, 1912-1979
- Judson, Sheldon, 1918-1999
- Libby, W.F. (Willard Frank), 1908-1980
- Rainey, Froelich, Director of the University Museum
- Ralph, Elizabeth K., 1911-2000

SUBJECT(S)

- Julsrud collection

- Pottery
- Radiocarbon dating
- Smithsonian Institution
- Thermoluminescence
- U.S. Atomic Energy Commission

Collection Inventory

CORRESPONDENCE.

	Box
A General.	1
Aitken, Martin J. 1961-1979.	1
Alvarez, Luis J. 1965.	1
American Cyanamid Co. 1966.	1
Atomic Energy Commission 1953-1974.	1
Ba-Bo General.	1
Br-Bu General.	1
Barringer, B. 1963-1973.	1
Bell, B. 1969-1971.	1
Bevan, Bruce 1970-1981.	1
Bonneval, Henri A. de 1975-1976.	1
Burdick, C.L. 1961.	1
C General.	1
Coe, Michael D. 1961-1974.	1

Consulting Communications, Inc. 1974.	1
D General.	1
E General.	1
Environmental Measurements (Lee Langan) 1968.	1
Eros Satellite Project 1966-1969.	2
F General.	2
Ford Foundation 1964-1970.	2
G General.	2
Geometrics, Co. 1969-1973.	2
Geophysical Specialties Co. 1960-1970.	2
Gray, W.R. (Witte Memorial Museum) 1962.	2
H General.	2
Hall, E.T. 1961-1974.	2
Hass, F.O. 1972-1976.	2
Haury, E.W. 1961-1975.	2
I General.	2
Inquiries to MASCA 1963-1980.	2
Iskander, Z. 1962-1973.	2
J General.	2

Judson, S. 1961-1972.	2
Julsrud Collection-Mexico 1969-1978.	2
K General.	2
The Kearns Group 1975-1978.	2
Kuniholm, Peter Ian (ARIT) 1974-1976.	2
L General.	2
Lerici, C.M. and Lerici Foundation 1960-1974.	2
Libby, W.F. 1951-1980.	3
Lockheed Missles 1966-1968.	3
Ma-Mc General.	3
Me-My General.	3
MacLaughlin Electronics 1962-1965.	3
Mainwaring, Bruce 1964-1973.	3
Mass Spectrograph 1975-1977.	3
Rainey, Froelich, Director of the University Museum . Matson, F.R. 1961.	3

Controlled Access Headings

PERSONAL NAME(S)

- Aitken, Martin J., b.1922

- Bevan, Bruce W.
- Coe, Michael D., 1929-
- Haury, E.W., 1904-1992
- Iskander, Zaki, 1912-1979
- Judson, Sheldon, 1918-1999
- Rainey, Froelich, Director of the University Museum
- Ralph, Elizabeth K., 1911-2000

Mexican Project 1960-1961.	3
Morrison, F. 1966-1967.	3
N General.	3
National Park Service 1962-1980.	3
National Science Foundation 1961-1977.	3
O General.	3
P, Q General.	3
Paramasivan, S. 1974-1975.	3
Petty Laboratories 1961-1973.	3
Polach, Henry A. 1970-1977.	3
Pomerance, Leon 1963-1969.	3
Princeton University Press 1960.	3
R General.	3
Raikes and Partners 1965-1976.	3
Raymond, Samuel 1965.	3

Roys, Lawrence 1961-1964.	3
Sa-Sh General.	3
Si-Su General.	3
Science 1966.	4
Shard, J.R. Inc. (Honduras) 1971.	4
Smithsonian Institute 1962-1979.	4
Sox, H. David, Rev. 1978.	4
Stanford Research Institute 1973-1975.	4
Sun Oil Company 1960-1975.	4
T General.	4
Texas Instruments 1960-1966.	4
Texas Research Foundation 1960-1963.	4
United States Air Force/Army 1961-1962.	4
V General.	4
Varian Associates 1959-1973.	4
Velikousky, Immanuel 1964-1967.	4
W General.	4
Whittlesey, Julian H. 1966-1974.	4
X, Y, Z General.	4

ELIZABETH RALPH.	Box 4
	Box
Personal Correspondence 1961-1982.	4
Froelich Rainey Correspondence 1960-1978.	4
University Correspondence 1973-1975.	4
Archaeological Institute of America (AIA) Correspondence 1969-1973.	4
Archaeological Institute of America (AIA) Tours; Misc. 1969-1970; 1973.	4
Requests for Publications 1951-1979.	4
TIME/LIFE Consultancy 1970; 1973.	4
"Geophysical Implications of Radiocarbon Measurements" (Dissertation) 1973.	5
Chapter for Proposed AIA Guidebook 1966.	5
Publications, Books/Journals 1965-1978.	5
Book Proposal-Noyes Press 1973-1977.	5
Reviews, Proposals, Papers, Books 1966-1979.	5
Talks/Seminars/Conferences 1952-1966 (1 of 3).	5
Talks/Seminars/Conferences 1952-1966 (2 of 3).	5
Talks/Seminars/Conferences 1952-1966 (3 of 3).	5
New Zealand Conference 1971-1974.	5

ADMINISTRATION.

	Box
Equipment listings 1963.	5
Techniques-Background 1965-1971.	5
Equipment-Magnetometer Correspondence 1959-1981.	5
Equipment-Magnetometer Plans and Calculations 1962-1963.	5
Equipment-Magnetometer Batteries 1960-1970.	5
Equipment-Magnetometer Brochures n.d.	5
Equipment-Magnetometer Requests for Information 1961-1974.	5
Equipment-Magnetometer Miscellaneous.	6

	Box
EQUIPMENT-RADIATION PROTECTION 1979.	6

	Box
EQUIPMENT-SUPPLIERS 1963-1968.	6
Organizational Charts 1961; 1977.	6
Personnel-Lists, Salaries 1962-1981.	6
Personnel-Correspondence 1960-1980.	6
Budget 1960-1979.	6
Building Space 1963-1980.	6
Travel 1968.	6

Miscellaneous.	6
Reports-Research 1961-1975.	6
Reports-Techniques 1960-1971.	6

PUBLICITY.

	Box
General 1965-1975.	6
Conferences, Symposia 1974.	6
Carbon-14 Dating 1953-1976.	6
Magnetometer Use 1956-1973.	6
Magnetometer-Sybaris 1960-1969.	6
Thermaluminescence Dating 1965-1969.	6
Thermaluminescence-Ban Chiang 1975.	6
Foreign Press 1963.	6
Miscellaneous 1973; 1995.	6

RAINEY, FROELICH, DIRECTOR OF THE UNIVERSITY MUSEUM . GRANTS/PROPOSALS.

Controlled Access Headings

PERSONAL NAME(S)

- Aitken, Martin J., b.1922
- Bevan, Bruce W.
- Coe, Michael D., 1929-
- Haury, E.W., 1904-1992
- Iskander, Zaki, 1912-1979
- Judson, Sheldon, 1918-1999
- Rainey, Froelich, Director of the University Museum
- Ralph, Elizabeth K., 1911-2000

SUBJECT(S)

- Pottery
- Radiocarbon dating
- Smithsonian Institution
- Thermoluminescence

	Box
NSF-G 13256-"Research on Archaeological Techniques" 1961.	6
NSF-G 18571-"Research and Development in New Techniques in Archaeology" 1961-1962.	6
NSF-G 16 (Continuation of G 18591)-"Research in Archaeological Techniques" 1962-1963.	6
NSF-294-"Science Center for Archaeology" 1962-1964.	7
NSF-Proposal-"Research in the History and Chronology of Metals" 1963.	7

NSF-Proposal-"Studies of Remanent Magnetic Measurements" 1963.	7
NSF-Proposal-"Training Program in Metallurgy and Archaeology" 1963-1964.	7
NSF-Correspondence on Three Proposed Projects 1964-1965.	7
NSF-GS 3778-"Dating of Pottery by Thermoluminescence" 1964-1967.	7
NSF-CS 566-"Dating of Archaeological Evidence by Thermoluminescence" 1964.	7
NSF-GS 1040-Development of the Cesium Magnetometer" 1965-1968.	7
NSF-Information Center and Training 1965.	7
NSF-GP 4766-"Metallurgy of Archaeological Specimens" 1965-1968.	7
NSF-GS 1028-Continuation of "Dating Pottery by Luminescence" 1965-1966.	7
NSF-GS 1568- "Dating of Archaeological Evidence of Thermoluminescence" 1967-1968.	7
NSF-Proposal-"Testing of Cesium Magnetometers and Aerial Reconnaissance Techniques" 1967-1968.	7
U.S. Air Force-Proposal-"Near and Remote Sensing of Buried Archaeological Features" 1969.	7
NEH-Proposal-"Information Center (MASCA) for Archaeology" 1970.	7
NPS (Dept. of Interior) 14-10-9-900-369-"Aerial Photography at Archaeological Sites" 1971-1973.	7
NSF-Proposal-"Investigation of Archaeological Remains Using Organic Chemical Techniques" 1971.	7
NSF-GS 36308K(36308K1) "Museum Applied Center for Archaeology"(MASCA) 1971-1975 (1 of 3).	7

NSF-GS 36308K(36308K1) "Museum Applied Center for Archaeology"(MASCA) 1971-1975 (2 of 3).	7
NSF-GS 36308K(36308K1) "Museum Applied Center for Archaeology"(MASCA) 1971-1975 (3 of 3).	7
NSF-Proposal-"Age and Magnetism of Very Young Volcanic Rocks in Japan" 1973.	7
NSF-SOC75-04203-"MASCA" 1974-1977 (1 of 3).	7
NSF-SOC75-04203-"MASCA" 1974-1977 (2 of 3).	8
NSF-SOC75-04203-"MASCA" 1974-1977 (3 of 3).	8
NSF-Proposal-"Application of Physical Science to Archaeology" 1976.	8
NSF-BNS-78-11042-"Germanium Gamma-Ray Detector For Improved Precision in Thermoluminescence Dating" (1 of 2) 1978.	8
NSF-BNS-78-11042-"Germanium Gamma-Ray Detector For Improved Precision in Thermoluminescence Dating" (2 of 2) (Additional Proposal) 1978.	8
NSF(RIAS funding)-"Research Initiation and Education in Application of Physical Science to Archaeology, Anthropology and Geology" 1976 (1 of 2).	8
NSF(RIAS funding)-"Research Initiation and Education in Application of Physical Science to Archaeology, Anthropology and Geology" 1976 (2 of 2).	8
NSF-Soc 77-08186-"MASCA" Continuing Research 1977.	8
William Penn Foundation-5-24792-"Support for a Graduate Student" 1977-1980.	8
NPS-CX4000-7-0022 "Archaeological Survey and Research at Valley Forge National Historical Park" 1977.	8

PROJECTS.

	Box
Lists.	8
Aerial Photos-Several sites 1967-1974.	8
Canada-Fort Lennox-Magnetometer 1964.	8
Canada-Les Forge-San Maurice-Magnetometer 1975.	8
Canada-Nova Scotia, Fortress of Louisburg Magnetometer 1963.	8
Egypt-Malkata-Magnetometer 1972-1973.	8
Egypt-Memphis-Magnetometer 1966.	8
Egypt-Qurna, Elephantine-Magnetometer 1973.	9
England-Gloucestershire, Kings Cote-Magnetometer 1971.	9
France-Wissant, Camp de Cesar 1971.	9
Greece-Elis-Magnetometer 1968.	9
Greece-Helice-Magnetometer 1966.	9
Greece-Paros-Magnetometer 1974.	9
Greece-Thera-Magnetometer 1967.	9
Guatemala-Tikal-Magnetometer 1961.	9
Iran-Tepe Malyan-Magnetometer 1972-1976.	9
Ireland-Dun Ailinne-Magnetometer 1968.	9

Ireland-Navan Fort-Magnetometer 1963.	9
Italy-Testing of Electrical Survey Equipment 1961.	9
Italy-Artena-Magnetometer 1966.	9
Italy-Cosa-Magnetometer 1969.	9
Italy-Gravina di Puglia, Casa S. Paola-Magnetometer 1966.	9
Italy-Poto Cheli-Magnetometer 1966.	9
Italy-Sele-Magnetometer 1966.	9
Italy-Veio-Magnetometer 1966.	9
Jordan-Dananir, Baq'ah Valley-Magnetometer 1979 (1 of 2).	9
Jordan-Dananir, Baq'ah Valley-Magnetometer 1979 (2 of 2).	9
Mexico, Erzatlan-Magnetometer 1970 (1 of 3).	10
Mexico, Erzatlan-Magnetometer 1970 (2 of 3).	10
Mexico, Erzatlan-Magnetometer 1970 (3 of 3).	10
Mexico-Mexican Instrument Survey 1971-1973.	10
Mexico-San Lorenzo-Magnetometer 1969 (1 of 4).	9
Mexico-San Lorenzo-Magnetometer 1969 (2 of 4).	9
Mexico-San Lorenzo-Magnetometer 1969 (3 of 4).	9
Mexico-San Lorenzo-Magnetometer (Michael Coe) 1966 (4 of 4).	10
Turkey, Keban Magnetometer 1968.	10

United States, Alaska, Bering Land Bridge Magnetometer 1965.	10
United States, Arizona, Snaketown, Magnetometer 1965.	10
United States, Arizona, Tucson Magnetometer 1961.	10
United States, Arizona, Tucson, Magnetometer 1965.	10
United States, Arkansas, Arkansas State Prison Magnetometer 1974.	10
United States, Delaware, Eleutherian Mills Magnetometer 1968.	10
United States, Delaware, Dupont Black Powder Works, Hagley Museum Magnetometer 1963.	10
United States, Delaware, Odessa, Corbit Sharp House Magnetometer 1974.	10
United States, Maryland, Baltimore, Mount Claire House Magnetometer 1971.	10
United States, Massachusetts, Harvard Forest Magnetometer 1966.	11
United States, Michigan-Great Lakes-Magnetometer 1967.	11
United States, New Jersey-Marlton, Savich Farm Site Magnetometer 1977.	11
United States, New Jersey-Morristown, Beverwyck Manor Magnetometer 1970.	11
United States, New Jersey, New Brunswick, Camp Pebelton Magnetometer 1968.	11
United States, New Mexico, Chaco Canyon Radar Experiment 1974.	11
United States, Pennsylvania-Chester, Caleb Pusey House Magnetometer 1963.	11
United States, Pennsylvania, Graeme Park, Hope Lodge, Ephrata Cloister Magnetometer 1965.	11
United States, Pennsylvania, Norwood, Morton Mortonsen House Magnetometer 1968.	11

United States, Pennsylvania, Paoli, Wagner House Magnetometer 1973.	11
United States, Pennsylvania, Philadelphia, Fort Mifflin Magnetometer 1968.	11
United States, Pennsylvania, Schaefferstown, Baron Stiegel Tower Magnetometer 1975.	11
United States, Pennsylvania, West Chester, Brinton Cabin Site Magnetometer 1972.	11
United States, South Carolina, Fort Camden Magnetometer 1965.	11
United States, Texas, Petty Labs Magnetometer 1961-1963 (1 of 2).	11
United States, Texas, Petty Labs Magnetometer 1961-1963 (2 of 2).	11
United States, Washington, D.C. Magnetometer 1962.	11
United States, West Virginia, Harper's Ferry, U.S. Rifle Works Magnetometer 1963.	11
Yugoslavia, Divostin Magnetometer 1968-1970.	11
Thermoluminescence, Nigeria, Iran, Turkey, Aracoeli, Libya.	11
Thermoluminescence, Nigeria, Karo Sample 1973 (memo).	11

PUBLICATION.

	Box
Publication List of ASCA Staff 1960.	11
Linnington, R.E. "Contribution of Physics to Archaeological Salvage" 1960.	11
Rainey, Froelich "Techniques Program of the University Museum" 1961.	11

Rainey, Froelich "The Applied Science Center for Archaeology" 1963.	11
A.I.A. Newsletter "ASCA" 1963.	11
Ralph, Elizabeth "Comparison of a Proton and a Rubidium Magnetometer for Archaeological Prospecting" 1964.	12
Rainey, F. and Ralph, E "New Frontiers in Archaeological Exploration" 1964.	12
Ralph, E "The Search for Sybaris With a Portable Cesium Magnetometer" 1965.	12
Rainey, F. "New Techniques in Archaeology" 1966.	12
Rainey, F., Ralph, E. "Archaeology and Its New Technology" 1966.	12
Ralph, E., Morrison, F. and O'Brien, D. "Archaeological Surveying Utilizing A High-Sensitivity Difference Magnetometer" 1967.	12
Ralph, E., Morrison, F. and O'Brien, D. "A High-Sensitivity Difference Magnetometer: An Archaeological Application" 1968.	12
Ralph, E. "Archaeological Prospecting" 1968.	12
MASCA Information Center "MASCA" 1969.	12
Rainey, F. "The Location of Archaic Greek Sybaris" 1969.	12
Ralph, E. "Cesium Magnetometer Survey at Kingscote, Gloucestershire, England" 1971.	12
Butterbaugh, D. "Mud Brick Conservation Project" 1973.	12
Bevan, B. "Stereo Photography for the Archaeologist" 1973.	12
Weinstein, J. "A Fifth Dynasty Reference to Annealing" 1974.	12
Rainey, F. "Science and Archaeology" 1974.	12

Han, M. "Effects of Alpha Dose and Annealing Temperature Upon Pottery Dating by Thermoluminescence" 1974.	12
Bevan, B. "Aerial Photography for the Archaeologist" 1975.	12
Ralph, E. "Britannica Yearbook of Science and the Future" 1975.	12
Bevan, B. "Detection of Crop Mark Contrast For Archaeological Surveys" 1975.	12
McGovern, P. "Stone Age Beer" 2005.	12
Han, M., O'Connor, D. "Methods of Pottery Research As it is Carried Out by ASCA, University Museum, Pennsylvania" Undated Rainey, F. "Archaeology" Undated.	12

PHOTOGRAPHS.