

Register to the Papers of
Richard L. Hay

Lorain Wang
July 2009

National Anthropological Archives
Smithsonian Institution

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Biographical Note

Richard LeRoy Hay was a geologist, known for his contributions to sedimentary petrography and archaeological geology. He worked closely with Mary Leakey for more than 30 years and provided the geological framework for Olduvai Gorge and Laetoli in Tanzania.

Hay was born on April 29, 1926 in Goshen, Indiana. He attended Ursinus College briefly (1944-45) before transferring to Northwestern University, where he received his B.S. (1946) and M.S. (1948) in geology. In 1952, he earned his Ph.D. in geology from Princeton University and served in the U.S. Army Corps of Engineers (1952-54).

After leaving the army, Hay worked as a geologist for the U.S. Geological Survey (1954-1955) and in 1955 began his academic career at Louisiana State University, Baton Rouge. In 1957 he accepted a position at University of California, Berkeley and remained there until his retirement in 1983. From 1983 to 1997, Hay was the Ralph E. Grim Professor of Geology at University of Illinois, Urbana Champaign, and later had an appointment as adjunct professor at the University of Arizona, Tucson (1998-2006).

Hay made his first trip to Olduvai Gorge in 1962 and continued to research and publish numerous articles on Olduvai for the next four decades. His most significant publication was his monograph, *Geology of the Olduvai Gorge* (1976), in which he provided a detailed study of the geologic history of Olduvai, placing hominid remains and other archaeological findings at the site in a paleogeographic context. Also significant was his geological analysis of tuff at Laetoli bearing early hominid footprints; he coauthored with Mary Leakey "Pliocene Footprints in the Laetoli Beds at Laetoli, Northern Tanzania" (1979) and "The Fossil Footprints of Laetoli" (1982).

In addition to Olduvai Gorge and Laetoli, Hay conducted geological fieldwork at Oldoinyo Lengai, Ngorongoro caldera, and Kerimasi volcano in Tanzania, as well as Rusinga Island, Lake Magadi, Amboseli, and Mount Suswa in Kenya. He also worked at several sites in the United States, including the John Day region of Oregon, the Green River formation in Wyoming, Amargosa Desert in Nevada, and Searles Lake in California. Additionally, he worked in west-central Wisconsin where he discovered the replacement of uppermost Precambrian and Cambrian-Ordovician rocks by low-temperature potassium-feldspar.

During his lifetime, Hay received many honors for his accomplishments in geology. He was a Fellow of the Geological Society of America, American Association for the Advancement of Science, and California Academy of Sciences. He was awarded the Geological Society of America's Kirk Bryan Award in 1978 and the Rip Rapp Archeological Geology Award in 2000. In 2001, he received the Leakey Foundation's Leakey Prize in 2001. Posthumously, a memorial was held for Hay at the GSA annual meeting in 2007.

Hay passed away at the age of 79 on February 10, 2006.

Sources Consulted

Ashley, Gail and Enrique Merino. 2006. Memorial to Richard Leroy Hay (1926-2006).
Geological Society of America Memorials, 35: 39-43.

“Curriculum vitae and letter.” Series 2. East Africa Research. Papers of Richard L. Hay.
National Anthropological Archives, Smithsonian Institution.

Chronology

- 1926 Born April 29 in Goshen, Indiana
- 1946 Earns B.S. in geology from Northwestern University
- 1948 Earns M.S. in geology from Northwestern University
- 1952 Earns Ph.D. in geology from Princeton University
- 1952-1954 Serves in U.S. Army Corps of Engineers
- 1954-1955 Geologist for the U.S. Geological Survey
- 1955-1957 Assistant Professor at Louisiana State University, Baton Rouge
- 1958-1983 Professor at University of California, Berkeley
- 1962 First visit to Olduvai Gorge in Tanzania
- 1978 Awarded Kirk Bryan Award by Geological Society of America
- 1983-1997 Ralph E. Grim Professor of Geology, University of Illinois, Urbana-Champaign
- 1998-2006 Adjunct Professor at University of Arizona, Tucson
- 2000 Awarded Rip Rapp Archeological Geology Award by Geological Society of America
- 2001 Awarded Leakey Prize by the Leakey Foundation
- 2006 Passes away at the age of 79 on February 10.

Selected Bibliography

1963 Stratigraphy and Zeolitic Diagenesis of the John Day Formation of Oregon. University of California Publications in Geological Sciences 42(5): 199-262.

with John Stark. Geology and Petrography of Volcanic Rocks of the Truk Islands, East Caroline Islands. U.S. Geological Survey Professional Paper, 409. Washington, D.C.: U.S. Government Printing Office.

Stratigraphy of Beds I through IV, Olduvai Gorge, Tanganyika: Science 139(3557): 829-833.

Zeolitic Weathering in Olduvai Gorge, Tanganyika. Geological Society of America Bulletin 74(10): 1281-1286.

1966 Zeolites and Zeolitic Reactions in Sedimentary Rocks. Geological Society of America Special Paper 85. New York: Geological Society of America.

1968 Petrology of Palagonite Tuffs of Koko Craters on Oahu, Hawaii. Contributions to Mineralogy and Petrology 17(2): 141-154.

with A. Iijima. Analcime Composition in Tuffs on the Green River formation of Wyoming. American Mineralogist 53, January-February: 184-200.

1970 Silicate Reactions in Three Lithofacies of a Semiarid Basin, Olduvai Gorge, Tanzania. Mineralogical Society of America Special Paper 3: 237-255.

1972 with G.H. Curtis. Further Geologic Studies and K-Ar Dating of Olduvai Gorge and Ngorongoro Crater. *In* Calibration of Human Evolution. W.W. Bishop and J.A. Miller, eds. Pp. 289-301. Edinburgh: Scottish Academic Press.

1973 Lithofacies and Environments of Bed I, Olduvai Gorge, Tanzania. Quaternary Research 3: 541-560.

1976 Geology of the Olduvai Gorge. Los Angeles: University of California Press.

1978 with R.K. Stoessell. Geochemical Origin of Sepiolite and Kerolite at Amboseli, Kenya. Contributions to Mineralogy and Petrology 65: 255-267.

1979 with M.D. Leakey. Pliocene footprints in the Laetolil beds at Laetoli, Northern Tanzania. Nature 278: 317-323.

1982 M.D. Leakey. The Fossil Footprints of Laetoli. Scientific American. 246: 50-57.

1983 Natrocarbonatite Tephra of Kerimasi Volcano, Tanzania. Geology 11(10): 599-602.

- 1984 with H. Bowman, F.H. Stross, F. Asaro, R.F. Heizer, and H.V. Michel. The Northern Colossus of Memnon: New Slants. *Archaeometry* 26, 218-229.
- 1986 with R.E. Pexton, T.T. Teague, and T.K. Kyser. Spring-related Carbonate Rocks, Mg Clays, and Associated Minerals in Pliocene Deposits of the Amargosa Desert, Nevada and California. *Geological Society of America Bulletin* 97(12): 1488-1503.
- 1988 with F.H. Stross, F. Asaro, H.R. Bowman, and H.V. Michel. Sources of the Quartzite of Some Ancient Egyptian Sculptures. *Archaeometry* 30(1): 109-119.
- 1989 Holocene Carbonatite-Nephelinite Tephra Deposits of Oldoinyo Lengai, Tanzania. *Journal of Volcanology and Geothermal Research* 37(1): 77-91.
- 1991 with S.G. Guldman, J.C. Matthews, R.H. Lander, M.E. Duffin, and T.K. Kyser. Clay Mineral Diagenesis in Core KM-3 of Searles Lake, California. *Clays and Clay Minerals* 39(1): 84-96.
- 1993 with R.H. Lander. Hydrogeologic Control on Zeolitic Diagenesis of the White River Sequence. *Geological Society of America Bulletin* 105(3): 361-376.
- 1999 with D.B. Finkelstein and S.P. Altaner. Origin and Diagenesis of Lacustrine Sediments, Upper Oligocene Creede Formation, Southwestern Colorado. *Geological Society of America Bulletin* 111(8): 1175-1191.
- 2001 with T.K. Kyser. Chemical Sedimentology and Paleoenvironmental History of Lake Olduvai, a Pliocene Lake in Northern Tanzania. *Geological Society of America Bulletin* 113(12): 1505-1521.
- 2003 with J. Liu, A. Deino, and T.K. Kyser. Age and Origin of Authigenic K-feldspar in Uppermost Precambrian Rocks in the North American Midcontinent. *Geological Society of America Bulletin* 115(4): 422-433.

Scope and Content Note

This collection comprises the professional papers of Richard LeRoy Hay. Among his papers are his correspondence with Mary D. and Louis S. B. Leakey and his research at Olduvai Gorge and Laetoli, consisting of his field notebooks, maps, photographs, data, and documentation of geological specimens he collected. Also in the collection is his research at other sites in East Africa, including Kerimasi and Oldoinyo Lengai in Tanzania and Rusinga Island in Kenya. To a lesser extent (although still a significant amount) in the collection is the documentation of Hay's research in the United States. Present are field notebooks and photographs from his research in Amargosa, Nevada which served as a geologic analog for Olduvai. Also in the collection are field notebooks spanning from 1958 to 2004 containing his notes on his research in Oregon; Hawaii; Wyoming; California; New Mexico; Colorado; Arizona; Wisconsin; and other regions in the country. Mixed in are notes from his research in other countries including Pakistan, Scotland, and France. Also in the collection are his field notebooks from his service in the U.S. Army Corps of Engineers, during which he spent some time in Japan. There are no notes from his work as a geologist for the U.S. Geological Survey.

Restriction

CD-RW containing scans of maps of Angata, Endulen, and Ngorngoro is restricted due to preservation concerns.

Extent

12.5 linear feet (13 document boxes, 3 flat boxes, 8 card file boxes, 1 oversized box) plus 1 CD-RW and 1 map folder

Provenance

These papers were donated to the National Anthropological Archives in January 2009 by Richard L. Hay's widow, Lynn Hay.

Related Collections

Hay's collections of thin sections and geological specimens from Olduvai Gorge, Laetoli, Oldoinyo Lengai, and Kerimasi volcano are held by the Smithsonian Institution's Human Origins Program.

For other materials at the National Anthropological Archives relating to Olduvai and Laetoli, please see the Louise Marie Robbins Papers.

Processing Note

The papers of Richard L. Hay were received partially organized. Most of the collection was packed and sent from Hay's home in Tucson after his death. A small portion of Hay's Olduvai photos, reprints of his publications, and X-ray diffraction data were sent to the archives later by his colleague Marie Jackson. The processing archivist kept existing groupings and arrangement and organized the collection into nine series. Original folder titles were retained with titles assigned by the archivist placed within square brackets. Oversized materials were separated and replaced with notes indicating original and new locations.

Series Description and Container List

Series 1. Correspondence with Mary and Louis Leakey. 1961-1970, 1988-1996

2 ½ inches

Mostly correspondence with Mary Leakey. Letters are arranged chronologically.

Box 1

[Leakey, Mary D.]	1965-68, undated
[Leakey, Mary D.]	1968-70
[Leakey, Mary D.]	1988-96
[Leakey, Louis S. B.]	1961-70

Series 2. East Africa Research. 1962-2002

3 linear feet, 1 map folder

Hay's fieldwork in Olduvai Gorge and Laetoli in Tanzania and other sites in East Africa spanned from 1962 to 2002. This series contains field journals, diagrams of stratigraphic sections, notes, data, photographs, and maps relating to his research in East Africa, which also include Oldoinyo Lengai, Ngorongoro caldera, and Kerimasi volcano in Tanzania as well as Rusinga Island, Lake Magadi, Amboseli, and Mount Suswa in Kenya. Absent from the collection are notes for his fieldwork in 1984, 1986-1988, 1990-1993, 1996, and 1997. Additional materials in this series are a curriculum vitae that he submitted for a grant to fund Olduvai research and reprints on Olduvai that he collected or were sent to him by the authors. *Subseries: Oldoinyo Lengai (carbonatites)*, an original grouping and name assigned by Hay, contains materials on both Lengai and Kerimasi and reprints on carbonatites.

Please see *Series 4. Sample Descriptions* for descriptions of geological specimens collected from Olduvai and Laetoli. See also *Series 1. Correspondence*, *Series 5. Specimen Sample List*, *Series 6. Publications*, and *Series 7. Photographs* for more materials relating to Olduvai and his other research in East Africa. *Series 3. Non-East Africa Research* may also be of interest as it contains Hay's Amargosa research, which served as an analog to Olduvai Gorge.

Subseries: Field notebooks
Subseries: Stratigraphic Sections
Subseries: Olduvai
Subseries: Laetoli
Subseries: Rusinga
Subseries: Oldoinyo Lengai (carbonatites)

Subseries: Maps

Box 2

Subseries: Field notebooks

62 - I thru 6/25	June 7-June 25
62 - II 6/26 - 7/16	
62 - III 7/17 - 8/6	
1964 I	June 11-July 4
1964 [II]	July 5-July 22
Natron Area	July 25-August 4
1964	August 8-December 16
<i>Soughou, Kariandusi, Nivaska, Akisim, and Calico Mountains</i>	
1967	June 28-August 13

Box 3

1968	June 20-August 13
<i>Includes Sicily</i>	
1969 - I thru 6/30	June 15-30
<i>"Olduvai 1969 I"</i>	
69 - II 7/1 on	July 1-23
<i>"Olduvai 1969 II"</i>	
70 I thru 6/18	May 17-June 18
70 - II 6/19 on	June 19-July 8
1972	

Box 4

72 I	June 16-July 18
72 II	July 2-July 23
<i>"Olduvai II"</i>	
1973	September 5-25
1973-74	December 25-January 11
1975	June 30-August 3
1976	July 3-November 18
1978	July 1-28
1979	August 14-31
1981	July 16-31
1982	July 16-August 20
1983	July 8-August 14
Rusinga 85	March 17-April 13

Box 5

1989	July 21-August 7
94- 95	1993 August 14, 1995 July 16-23
98-99	1999 July 3-August 6
2000	July 15-August 6
2001	July 1-August 7
2002	July 6-July 30
Swahili	
<i>English-Swahili translations of phrases and words</i>	

Subseries: Stratigraphic Sections

[Stratigraphic sections of Olduvai and Laetoli]

Oversize Box

Sections 1 thru 8 (N side of gorge, mouth thru CK)
 Sects 9-14 (3rd F – Camp area, N side)
 Loc 15 thru 25a
 Sects 26 to 32 (Balbal, S. of Gorge; mouth to ELK on S. Side)
 Sects 32a – 45 (W. of 3^d F.S. side, to FLK, VEK)
 Sects 47-66 (M. Gorge, S. side, to W. of FLK)
 Sects 67-84 (N side M. Gorge to W. FK)
 Sects 85-101 S.d Gorge – SWK to Kelogi; 85-101, 203-5
 [Unidentified sections]
 [Unidentified sections]
 [Unidentified sections]

Subseries: Olduvai

Box 5 (continued)

XRD Clay Mineralogy Olduvai ‘89
 Clay Mineralogy XRD - Olduvai Loc 80, Sikes’ Series
 Clay Mineralogy XRD - Olduvai 95 (bulk) also 30% KF, 70%, Mg - smectek [?]
 Clay Mineralogy XRD - Olduvai 1995 + ‘93 (oriented)
 ISGS Cores
 Clay Mineralogy XRD (1962-64) - Olduvai Pre-89
 Clay Mineralogy XRD - Olduvai ‘69
 XRD Clay Mineralogy - Olduvai 72-74

XRD Clay Mineralogy - Olduvai 1996 - 060
Olduvai 96 work

Box 6

XRD 2001

Illustrations for Presort [?]

Olduvai and Ngorongoro

[Curriculum vitae and letter]

1988, undated

Curriculum vitae for Olduvai-related research proposal plus a letter from Robert J. Blumenschine inviting Hay to act as geological consultant for the Olduvai Archaeological Project

[Miscellaneous]

Materials separated from Olduvai reprints: 2004 final report for "Revised stratigraphy: geochemical fingerprinting, paleomagnetism and $^{40}\text{Ar}/^{39}\text{Ar}$ dating, Olduvai Gorge, Tanzania"; e-mail regarding Olduvai faunal evidence for Serengeti chapter; figures and tables; page from article; and notes

Geological Survey of Tanganyika Report RP/23: A Contribution to the Geology of the Olduvai Gorge by R. Pickering

Olduvai Reprints [1 of 2]

Olduvai Reprints [2 of 2]

Subseries: Laetoli

Laetoli 1982 -- Footprint Tuff data

First Draft - Leakey & Hay – Laetoli

Includes 35mm slides

Laetoli - Lith. Photos & gen. [?]

1978

Photos

Laetoli 1982 -- Laetolil Photography FPT [1 of 2]

1982

Photos of Laetoli footprints and Olduvai

Laetoli 1982 -- Laetolil Photography FPT [1 of 2]

1982

Box 7

Subseries: Rusinga

[Articles on Rusinga]

Rusinga [charts]

93-95 [Rusinga]

Rusinga [air photos]

See Box 21

Rusinga -- Mfangano Air Photos for Dr. Alan Walker
(55 photos)

See Box 21

Subseries: Oldoinyo Lengai (carbonatites)

Keramasi + Lengai Slides

Keramasi + Lengai photos

Lengai Figs.

Photographs

Carbonatite Photomicro.

Photographs

Carbonatite

"Lengai - new isotope data"

Carbonatite Reprints [1 of 3]

Box 8

Carbonatite Reprints [2 of 3]

Carbonatite Reprints [3 of 3]

Subseries: Maps

[Ngorongoro Conservation Area map]

Geological Survey of Tanganyika. Angata Salei -
Quarter Degree sheet 39

See Map Drawer; 1961 edition, uncorrected

Olduvai Geologic Map + LSBL Section at MK

See also Map Drawer

Tanzania Geological Maps - Angata, Endulen,
Ngorongoro

RESTRICTED – *CD-RW containing Tiff files of
scans of maps: Geological Survey of Tanganyika.
Angata Salei - Quarter Degree sheet 39, 1st
edition; Endulen - Quarter Degree Sheet 52, 1st
edition; Ngorongoro - Quarter Degree Sheet 53,
1st edition; close-up of Ngorongoro crater*

Series 3. Non-East Africa Research. 1953-2004

10 inches

This series mostly contains field notebooks from Hay's research in the United States, with some notes mixed in from his research in other countries including Pakistan, Scotland, and

Series 2. East Africa Research

Series 3. Non-East Africa Research

France. At the beginning of the series are field notebooks and photographs from his Amargosa research, which served as an analog to Olduvai Gorge. The notebooks in the rest of the series are arranged in chronological order and cover his research in Oregon; Hawaii; Wyoming; California; New Mexico; Colorado; Arizona; Wisconsin; and other regions in the country. Also in the collection are his 1953 to 1954 field notes while stationed in Japan as a member of the U.S. Army Corps of Engineers. Only select sites covered in each notebook are listed below.

A few of the field notebooks in *Series 2. East Africa Research* contain some notes from Hay's research outside of East Africa. Please also see *Series 7. Photographs*.

Box 9

1979 Amargosa
 80-81 Amargosa II
 82-84 III Amargosa
 Amargosa 84
 Amargosa [prints]
 Amargosa Slides [1 of 2]
 Amargosa Slides [2 of 2]
 [1953]
Japan
 [1953-54]
Japan

Box 10

[1954]	
<i>Japan</i>	
1958	June 16-August 5
<i>Clarno Study</i>	
1959	August 1-September 11
<i>Oregon - Crater Lake, Ochoco, John Day Fossil Beds</i>	
Misc. '59-71	
<i>California</i>	
1960	July 2-29
<i>John Day area</i>	
1961	July 1-August 14
<i>John Day area</i>	
1965 II	July 1-August 16
<i>Oahu - Koko Crater, Rabbit Island, Tantalus, Salt Lake, Pearl Harbor; Green River (Utah?), Columbine, Colorado</i>	
1972-77	
<i>Point Reyes Beach, Sarna, Oahu, California</i>	

1977

June 26-December 31

Southwest

1978-79, -80

California, New Mexico, Utah

81, 82, 83

France, California

1987 & 88

Hawaii, CA, Grand Canyon

89-91

Tri-state, Mo, Wisconsin, Pakistan, Scotland

2002-2004

Tahiti, Colorado Plateau, Tucson, Chile, Argentina

Series 4. Sample Descriptions

5 linear feet

Descriptions on file cards of geological samples collected from Olduvai Gorge and Laetoli.

Box 11

Olduvai Gorge Beds I - III

Box 12

Olduvai Gorge II, III-IV & Natron

Box 13

Olduvai Beds III-IV Masek, Ndutu; Stones

Box 14

Olduvai (47B)

Box 15

Olduvai & Carbonatite

Box 16

Olduvai Ns. 1972 Calcrete, L. Ndutu

Box 17

Laetoli & Carbonatites

Series 5. Specimen Sample Lists. 1959-1998

5 inches

Lists of Hay's collections of geological specimens from various sites around the world, including Olduvai.

Box 18

Specimen List - Summer 1962
Specimen List - Summer 1964
1967 Spec. List (also MDL 64, 65, 66, 67)
Also includes Hawaii, 1959
Specimen List 1968 + MDL 1969
Specimen List 1969 + MDL 70
Olduvai - Sample data -- 1969-1970 Sample list
Includes samples from 1962
Specimen List 1970[-72]
Specimen List 1972
Specimen List 1973
Samples 73-74
75 Clear Cr. - Spec. List 1975
Specimen List 1976
Specimen List - 1977
Specimen List 1978
Specimen List - 1979 - I (North Amargosa, March & Oct)
Specimen List - 1979 - II
Spec. List 1980
1981 Spec. List
Specimen List 1982
1983 Samples & Cp [?]
1984 Samples
Includes samples from 1989
1985 Samples
1986
1987
1988
1989 Samples
1990 Specs List

1991
 Liu Specs, May 92
 1992, Also 93 for Mo trip
 1993 & 4
 1995
 1996
 1997 Samples
 98 - Collecting
 98 - VI/AZ Collections
 G.R. Fm KF
 Laetoli - Boxed Spec.
 Boxed Samples, UC --> UI
 Packing & Organization

Series 6. Publications. 1959-2004

5 inches

Reprints of articles by Hay and a copy of his monograph *Geology of the Olduvai Gorge* (1976). Also in this series is the "Medals and Awards" section of the *Geological Society of America Bulletin* for 1978, which includes Hay's acceptance speech for the Kirk Bryan Award. The publications are unarranged.

Box 19

[List of Publications]

[Reprints, 1 of 3]

<i>The Judicious Selection and Preservation of Tuff and Travertine Building Stone in Ancient Rome</i>	2004
<i>Chemical Sedimentology and Paleoenvironmental History of Lake Olduvai, a Pliocene Lake in Northern Tanzania</i>	2001
<i>Origin and Diagenesis of Lacustrine Sediments, Upper Oligocene Creede Formation, Southwestern Colorado</i>	1999
<i>Clay Mineral Diagenesis in Core KM-3 of Searles Lake, California</i>	1991
<i>Stratigraphy and Lake-margin Paleoenvironments of Lowermost Bed II in Olduvai Gorge</i>	1996
<i>Spheroids at the Cretaceous-Tertiary Boundary are Altered Impact Droplets of Basaltic Composition</i>	1983
<i>18O/16O Ratios in Cherts Associated with the Saline Lake Deposits of East Africa</i>	1973
<i>Zeolites in Sedimentary Rocks</i>	
<i>Magnesium-Rich Clays of the Meerschaum Mines in the Amboseli Basin, Tanzania and Kenya</i>	1995

<i>Potassic Alteration in the St. Francois Mountains of Missouri</i>	1993
<i>Investigation of Al,Si Order in K-feldspars using ²⁷Al and ²⁹Si MAS NMR</i>	1995
<i>Potassium-Argon Dating of Bed I, Olduvai Gorge, 1961-1972</i>	1992
<i>Laser-fusion ⁴⁰Ar/³⁹Ar dating of Bed I, Olduvai Gorge, Tanzania</i>	1991
<i>Field Trip #2 Precambrian-Cambrian Boundary in West-Central Wisconsin</i>	1991
<i>Potassic Diagenesis of Cambrian Sandstones and Precambrian Granitic Basement in UPH-3 Deep Hole, Upper Mississippi Valley, U.S.A.</i>	1989
<i>Sources of the Quartzite of Some Ancient Egyptian Sculptures</i>	1988
<i>Diagenetic Alteration of Silicic Ash in Searles Lake, California</i>	1987
<i>Sepiolite in the Amboseli Basin of Kenya: A New Interpretation</i>	1984
<i>Natrocarbonatite Tephra of Kerimasi Volcano, Tanzania</i>	1983
<i>Carbonatite Tuffs in the Laetoli Beds of Tanzania and the Kaiserstuhl in Germany</i>	1983
<i>The Fossil Footprints of Laetoli</i>	1982
<i>Role of Tephra in the Preservation of Fossils in Cenozoic Deposits of East Africa</i>	1986
<i>Pliocene Footprints in the Laetoli Beds at Laetoli, Northern Tanzania</i>	1979
<i>Chronological Position of the Fossil Hominids of Tanzania</i>	1982
<i>Formation of the Crystal-Rich Glowing Avalanche Deposits of St. Vincent, B.W.I.</i>	1959
<i>Paleoenvironment of the Laetoli Beds, Northern Tanzania</i>	1981
<i>Zeolitic Weathering of Tuffs in Olduvai Gorge, Tanzania</i>	1980
<i>The KBS Tuff Controversy May be Ended</i>	1980
<i>Pellets, Ooids, Sepiolite and Silica in Three Calcretes of the Southwestern United States</i>	1980
[Reprints, 2 of 3]	
<i>[Encyclopedia entry for Olduvai Gorge]</i>	1979
<i>Globule Ignimbrite of Mount Suswa, Kenya</i>	1979
<i>Medals and Awards for 1978</i>	1978
<i>Environmental Setting of Hominid Activities in Bed I, Olduvai Gorge</i>	
<i>Volcanic Ash - Diagenesis</i>	1978
<i>Melilitite-Carbonatite Tuffs in the Laetoli Beds of Tanzania</i>	1978
<i>Calcretes of Olduvai Gorge and Ndolanya Beds of northern Tanzania</i>	1978
<i>The Geochemical Origin of Sepiolite and Kerolite at Amboseli, Kenya</i>	1978
<i>Isotopic evidence for dramatic climatic changes in East Africa during the Pleistocene</i>	

<i>Fossil hominids from the Laetolil Beds</i>	1976
<i>The Olduvai Event at Olduvai Gorge</i>	1976
<i>The MNK Chert Factory Site, Olduvai Gorge, Tanzania</i>	1974
<i>Lithofacies and Environments of Bed I, Olduvai Gorge, Tanzania</i>	1973
<i>Weathering of Basaltic Tephra on the Island of Hawaii</i>	1972
<i>Stratigraphy, archaeology, and age of the Ndutu and Naisiusiu Beds, Olduvai Gorge, Tanzania</i>	1972
<i>Geologic Background of Beds I and II Stratigraphic Summary</i>	1971
<i>The Northern Colossus of Memnon: New Slants</i>	1984
<i>Preliminary notes on the Stratigraphy of Beds I-IV, Olduvai Gorge, Tanganyika</i>	1964
<i>Evernden and Curtis: Potassium-Argon Dating</i>	1965
<i>Stratigraphy of Beds I through IV, Olduvai Gorge, Tanganyika</i>	1963
<i>Authigenic Silicate Minerals in Searles Lake, California</i>	1963
<i>Environment and Archeology</i>	1966
<i>Geomagnetic Polarity Epochs: New Data from Olduvai Gorge, Tanganyika</i>	1967
<i>Stratigraphy and Paleoclimatic Interpretation of Beds I through IV in Olduvai Gorge</i>	1967
<i>Tuff lava</i>	1967
<i>Hominid-Bearing Deposits of Olduvai Gorge</i>	1967
[Reprints, 3 of 3]	
<i>Revised Stratigraphy of Olduvai Gorge</i>	1967
[chart]	
<i>Petrology of Palagonite Tuffs of Koko Craters, Oahu, Hawaii</i>	1968
<i>Chert and Its Sodium-Silicate Precursors in Sodium-Carbonate Lakes of East Africa</i>	1968
<i>Makatite, A New Hydrated Sodium Silicate Mineral from Lake Magadi, Kenya</i>	1970
<i>Geomagnetic Polarity Epochs: Age and Duration of the Olduvai Normal Polarity Event</i>	1971
<i>Paleomagnetism and Potassium-Argon Ages of Volcanic Rocks of Ngorongoro Caldera, Tanzania</i>	1970
<i>Zeolites and Zeolitic Reactions in Sedimentary Rocks</i>	1966
<i>Phillipsite of Saline Lakes and Soils</i>	1964
<i>Zeolitic Weathering in Olduvai Gorge, Tanganyika</i>	1963
<i>Olduvai Gorge; A case history in the interpretation of hominid paleoenvironments in East Africa</i>	1990
<i>Zeolites and Clay Minerals at Olduvai Gorge: a Look Back</i>	1993
<i>Potassium-Argon Dating of Bed I, Olduvai Gorge, 1961-1972</i>	1992
<i>Tephrochronology of Bed I, Olduvai Gorge: An Application of Laser-Fusion ⁴⁰AR/³⁹AR Dating to Calibrating Biological and Climatic Change</i>	1992

<i>New Developments in the Geology of Natural Zeolites</i>	1993
<i>Sedimentation Patterns in a Plio-Pleistocene Volcaniclastic Rift-Platform Basin, Olduvai Gorge, Tanzania</i>	2002
<i>Late Pliocene Homo and Hominid Land Use from Western Olduvai Gorge, Tanzania</i>	2003
<i>Dating the Naisiusiu Beds, Olduvai Gorge, by electron spin resonance</i>	2003
<i>Silicate Reactions in three Lithofacies of a Semi-Arid Basin, Olduvai Gorge, Tanzania</i>	1970
<i>An Isotopic Study of Paleosol Carbonates from Olduvai Gorge</i>	1986
Geology of the Olduvai Gorge: A Study of Sedimentation in a Semiarid Basin	1976

Series 7. Photographs. 1957-1999

2 linear feet

This series is mostly comprised of photos of rock samples and aerial and site photos of Olduvai, Laetoli, and surrounding areas. Folders with alphanumerical titles in boxes 21 through 23 refer to site numbers in that region and contain aerial photos. Also in this series are photos of Panamint Springs, a crater in Panama, and unidentified rock samples.

More photos can be found in *Series 2. East Africa Research* and *Series 3. Non-East Africa Research*.

Box 20

Misc. Photos

Panamint Springs, Panama Crater, and unidentified rock samples

[Scrapbook photos]

Circa 1960s

See Oversize Box; *field photos of East Africa, Sicily, and Syracuse; also Life magazine article on Richard Leakey, "On safari with a man called ostrich."*

[Olduvai photos with cropping marks, 1 of 2]

[Olduvai photos with cropping marks, 2 of 2]

Has 2d fault

[Olduvai transparencies, 1 of 3]

[Olduvai transparencies, 2 of 3]

[Olduvai transparencies, 3 of 3]

1995 (Olduvai), 1972 (old), 1995 (SPA)

Olduvai - Photos

E. Af. Chert Photos

Concretures etc. -- Olduvai

1999

Series 6. Publications

Series 7. Photographs

Olduvai & Self

Only photos of rock samples; no photos of Hay
[Unidentified aerial photos]

See Oversize Box

Laetolil Flight lines & photo nos.

Olduvai Gorge - Field Air Photos, Working Set

Box 21

Rusinga [air photos]

Rusinga -- Mfangano Air Photos for Dr. Alan Walker
(55 photos)

[Notes, maps, and aerial photos]

29TN1 1957

Box 22

29TN1 1957

29TN2 1957

35TN2 1958

[35TN3] 1958

35TN5 1958

35TN6 1958

35TN8 1958

35TN10, 74-80 L. Ndotu S. toward Eyasie 1958

Box 23

35TN11 1958

35TN12 1958

35TN14 1958

35TN15 1958

35TN16 1958

Kerimasi & Vicinity 1957-58

Enlargements 1958

Series 8. Fieldwork Tools

6.5 inches

This series contains magnifiers and surveying tools used by Hay in the field.

Box 24

[10x Hastings Triplet magnifier]

Series 7. Photographs

Series 8. Fieldwork Tools

[Magnifying glasses (Q-O-S COR, New York) in leather pouch]
[Matuzaki Seiki #8020 surveying tool set]