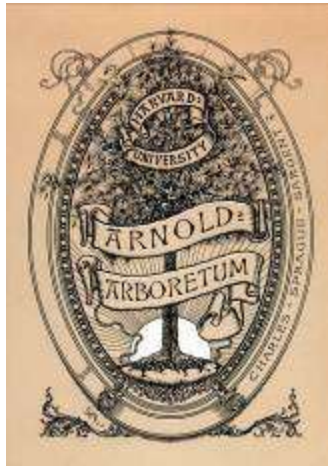


Archives I B KS

Karl Sax papers (1892-1973), 1938-2001: Guide



The Arnold Arboretum of Harvard University

© 2012 President and Fellows of Harvard College

Karl Sax (1892-1973) papers, 1938-2001: Guide

**Archives of the Arnold Arboretum of Harvard University
125 Arborway, Jamaica Plain, Massachusetts**

© 2012 President and Fellows of Harvard College

Descriptive Summary

Repository: Archives of the Arnold Arboretum of Harvard University, Jamaica Plain, MA

Call No.: IB KS

Location: Archives

Title: Karl Sax (1892-1973) papers, 1938-2001

Date(s): 1938-2001

Creator: Karl Sax (1892-1973)

Quantity: 5 linear feet (23 boxes and 2 oversize folders)

Abstract: The papers of Karl Sax were compiled primarily during his tenure as Director of the Arnold Arboretum from 1946 to 1954, though their contents reflect both his administrative work and his research in cytology, horticulture, and genetics. Originally from Washington, Sax spent many years studying and researching in Maine and Massachusetts. Sax's tenure at the Arboretum was filled with challenges, as his administration dealt with both the controversial "Bailey Plan" and redeveloping a collection neglected during World War II. Sax's collection spans the years 1938-2001, covering his time as a professor and as director of the Arnold Arboretum and including collection-related correspondence from Edward A. Sax.

Note: Access to Finding Aid record in [Hollis Classic](#) or [Hollis](#).

Preferred Citation: Karl Sax (1892-1973) papers, 1938-2001. Archives of the Arnold Arboretum of Harvard University.

Additional material: Additional Karl Sax correspondence may be found by searching the [Arnold Arboretum Correspondence Index](#). For additional material related to the Arnold Arboretum Controversy, see I A-3 "The Controversy" records, 1945-1966.

Processing Information

June 2003, revised 2005. Updated April 2011, Kayleigh Hinckley. Revised April 2012, Liz Francis.

Acquisition Information

Provenance: The Karl Sax papers were compiled during Sax's tenure at the Arnold Arboretum. This collection was then transferred from the Arnold Arboretum's departmental holdings to the Arboretum's Archives in 1986 when the Archive was established. Supplemental correspondence from Edward A. Sax to Robert Cook in 2001 was added in 2004. In 2011, descendants of Sax donated several certificates and pieces of correspondence to the collection.

Terms of Access

Researchers seeking to examine archival materials are strongly encouraged to make an appointment. The Director, or an office of origin, may place restrictions on the use of some or all of its records. The extent and length of the restriction will be determined by the Director, office of origin, and the Archivist.

Terms of Use

The copyright is held by The President and Fellows of Harvard College for the Arnold Arboretum Archives of Harvard University. The copyright on some materials in the collection may be held by the original author or the author's heirs or assigns. Researchers are responsible for obtaining written permission from the holder(s) of copyright and the Arnold Arboretum Archives prior to publishing any quotations or images from materials in this collection.

Photocopies may be made at the discretion of the Arnold Arboretum Archives staff. Permission to make photocopies does not constitute permission to reproduce or publish materials outside the bounds of the fair use guidelines.

Biographical Note

Karl Sax served as the third director of the Arnold Arboretum (1946-1954). Both a research scientist and an administrator, Dr. Sax had the challenging responsibility of leading the Arboretum through a difficult transitional period. His administration dealt with the results of deferred maintenance of the living collection due to the labor and materials shortages caused by World War II. Also during his tenure as director, Sax had to address the controversy caused by the "[Bailey Plan](#)" to reorganize Harvard's Botany Department and remove resources from the Arboretum's Hunnewell Building and library by transferring herbarium specimens and books to a new building in Cambridge. Arboretum funds would also be used in the Department of Biology, and the interest in horticulture and the living collections would be lessened. Many people connected with the Arboretum were concerned that this move would compromise the work of the institution. In 1953, the Association for the Arnold Arboretum was incorporated and initiated a suit questioning whether the proposed organizational changes, with the funds of the Arboretum used within the Department of Biology, would be a breach of the trust under which the Arboretum was founded. Dr. Sax did not approve of the reorganization plan and refused to implement it without legal review. He resigned from his administrative duties in 1954.



Karl Sax, photographed by his son Karl Sax, Jr., 1951. A-2985

Karl Sax (1892-1973) was born in Spokane, Washington and received a B. S. in agriculture from Washington State in 1916. He earned an M.A. in biology from the [Bussey Institution](#) of Harvard University in 1917 and served in the US Army from 1917 to 1919. Sax joined the staff of the Agricultural Experiment Station at the University of Maine, and earned a D.Sc. from the Bussey Institution in 1922 while serving at Maine until 1928. In 1928, Dr. Sax was appointed Associate Professor of Plant Cytology at the Arnold Arboretum, faculty at the Bussey Institution, and became a full professor in 1936. When Elmer D. Merrill retired as director of the Arnold Arboretum in 1946, Sax was appointed acting director and director the following year. After stepping down as director in 1954, he remained as Professor of Biology until his retirement in 1959.



Sax with dwarfed apple tree,
photographed by Heman Howard,
August 13, 1959. R-3021

Dr. Sax was a pioneer researcher in cytology and genetics, focusing on chromosomal studies and their application to cross breeding of agricultural varieties. His studies of the methods of chromosome breakage used experimental exposure to X-rays and other types of radiation. His influential 1938 paper, "*Chromosome aberrations induced by X-rays*" opened up a new area of investigation subsequently developed by other scientists. His contributions in horticultural plant breeding produced many hybrid plants, which he named. After Sax left Harvard in 1954 he served as Visiting Professor of Botany at Yale University and spent the following year in Oxford, England as recipient of a Guggenheim Fellowship.

Sax became concerned about the problems of feeding an ever-expanding world population. He was a spokesman for the Planned Parenthood organization, and wrote a book on population problems, *Standing Room Only*. In his retirement years, Sax received grants from the National Institutes of Health to support his study of the radiometric effects of common products like coffee, cola drinks, drugs, and food additives.

In 1987 the National Academy of Sciences published a [biographical memoir](#) of Dr. Sax written by Carl P. Swanson and Norman H. Giles.



Dr. Karl Sax with his wife, Dr. Hally Sax, in their study at 380 South Street. Between them is the Zeiss microscope they shared for cytological research, and Karl is holding his recently published book *Standing Room Only*. Circa 1956.

Sax wrote many articles for the Arboretum's journal *Arnoldia* which are available to read online:

- ["Plant Hybrids."](#) *Arnoldia* 3: Vol. 5, 1931
- ["Flowering Habits of Trees and Shrubs."](#) *Arnoldia* 3: Vol. 6, 1932
- ["Plant Breeding at the Arnold Arboretum."](#) *Arnoldia* Vol. 7, No. 2, 1947
- ["The Bussey Institution."](#) *Arnoldia* Vol. 7, No. 3, 1947
- ["Rootstocks for Lilacs."](#) *Arnoldia* Vol. 10, No. 9, 1950
- ["Dwarf Trees."](#) *Arnoldia* Vol. 10, No. 12, 1950
- ["Plant Breeding at the Arnold Arboretum."](#) *Arnoldia* Vol. 15, No. 2, 1955
- ["Paste the Poison Ivy."](#) *Arnoldia* Vol. 16, No. 2, 1956
- ["The Juvenile Characters of Trees and Shrubs."](#) *Arnoldia* Vol. 18, No. 1, 1958

Scope and Content

This collection spans the years from 1938-1959, and primarily reflects Sax's research in cytology, horticulture, and genetics, but also includes his administrative work as director of the Arnold Arboretum from 1946-1954. Sax's objections to the Bailey Plan are noted in letters that date from 1949 to 1954. In addition to correspondence, there are logbooks of detailed data on experiments, notes on nursery plants, a crossing index, cytological reviews, Arboretum plant accession books 1939-1942, and records with notes on fertilization, planting, and plant propagation. In 2011, descendants of Sax donated several certificates and pieces of correspondence to the collection.

Arrangement

The Sax collection is arranged in 4 series:

- Series I: Biographical Material
- Series II: Correspondence
- Series III: Manuscripts
- Series IV: Plant Records and Research

Container List

Series I: Biographical Material

Box 1

Folder

- 1:** Autobiography of Karl Sax. 1948. Written in response to a request made by Raymond L. Zwemer from the National Academy of Sciences in 1948
- 2:** Correspondence requesting biographical information about Karl Sax for publication in the *Journal of the Arnold Arboretum* between Richard A. Howard and Peter Sax, Paul C. Mangelsdorf, and Clark A. Elliott. 1973, 1974
- 3:** Miscellaneous material about Karl Sax assembled by Richard A. Howard includes newspaper clippings, notice of memorial service, Xerox of article by S. B. Sutton, "[The Arboretum Administrators: An Opinionated History](#)," *Arnoldia* 32 (1) 1972.
- 4:** "Karl Sax 1892 -1973." Manuscript and drafts of Sax's bibliography of published writings by Richard A. Howard.
- 5:** "Karl Sax, 1892-1973" by Richard A. Howard. Reprint *Journal of the Arnold Arboretum* 55 (3) 1974.
- 6:** "Karl Sax, November 2, 1892-October 8, 1973" by Carl P. Swanson and Norman H. Giles. Printout, *Biographical Memoirs*. V.57 (1987).
- 7:** Photographs
- 8:** Correspondence between from Edward A. Sax, Karl Sax's youngest son, to

Bob Cook (Arnold Arboretum Director) regarding his father's administration. Extensive documentation photocopied from Sax's personal archive documenting the Arboretum controversy. Includes print version of "Dr. Sax's Arnold Arboretum files." Electronic version available on AAAI IB KS

9: Appointments

- Notice of appointment to Professor of Botany at Harvard University, January 15, 1936
- Notice of appointment to Acting Director of the Arnold Arboretum, July 15, 1946
- Notice of appointment to Director of the Arnold Arboretum, June 4, 1947

10: Hally Sax's personnel forms, Cabot Foundation for Botanical Research, 1943-1944

11: University of Maine diploma, Honorary Doctor of Science. June 3, 1971

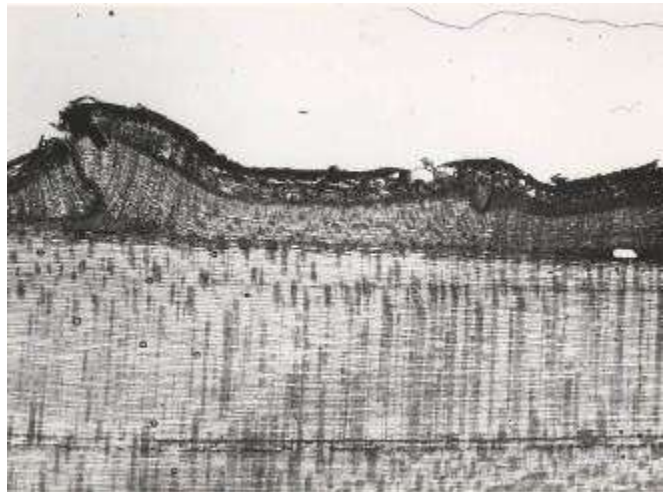
12: 25th anniversary certificate of recognition, April 30, 1957

13: Copies of Bussey Institution Collage Elements

14: Environmental Mutagen Society Award, August 1973

Oversize Folder: Awards

- Certificate of Merit in recognition of distinguished achievement in and contributions to the advancement of botanical science. The Botanical Society of America. Presented August 28, 1956. 11 x 16"
- Citation for sustained and thorough investigations in the genetics and cytology of many important genera of woody plants; for research in the physiology and propagation including interstocks and scion behavior, and for research that has led to important practical applications with horticultural plants. The American Horticultural Society Presented November 1960. 11 x 17"
- Distinguished Alumnus Award. Washington State University. Presented October 25, 1966. 11 x 17"
- Certificate [?] written in Japanese kanji. Presented by Yosito Sinoto, undated. 11 x 17"
- Photograph of Karl Sax, undated. 11 x 13"



Photographs of woody stem cross-sections from Box 15, Envelope 1. Unlabeled, undated. 1950s

Series II: Correspondence, 1938-1959

Box 1

- Aberconway, Lord, Royal Horticultural Society, London
- Ackerman, Robert W. Jr., Ackerman Nurseries, Bridgman, Michigan
- Ames, John S., Massachusetts Horticultural Society
- Ames, Oakes
- Amory, Jr., Copley
- Anderson, Edgar, Missouri Botanical Garden. February 16, 1948.
- Anthony, R., Department of Agriculture, Pennsylvania State College
- Babcock, E. B. University of California at Berkeley. December 21, 1951
- Bailey, David W., Massachusetts Hall, Harvard University. 11 letters, 1949-1958
- Bailey, Irving W., Biological Laboratory, Harvard University
- Bailey, L. H., Bailey Hortorium, Ithaca, New York. December 15, 1949
- Baitzell, George A., Yale University. 2 letters, 1951
- Balch, Francis N., 130 Prince Street, Jamaica Plain, MA. July 21, 1951
- Barr, Stringfellow, Foundation for World Government, Charlottesville VA. January 15, 1953
- Barrett, Herbert C.
- Barrett, Joseph G.
- Bennett, G. F.
- Bentinck-Smith, William [Missing]
- Berkeley, Edmund C.
- Berry, George T.
- Biggar, James, Lehman Hall, Harvard University
- Binney, Mary M.
- Blakeslee, A. F.
- Blanchard, Paul
- Bobbink, L. C.
- Bonner, David
- Bornstein, S.
- Borup, Asta
- Boston Crushed Stone and Asphalt Company
- Brandegee, Mrs. Brossman H.
- Brossman, H.
- Buck, Paul H.
- Bundy, McGeorge
- Cabot, Godfrey L.
- Cabot, Powell M.
- Carol re: Helen Hunt Arnold, award/citations by Emerson College and Garden Club of America. May 10, [1956].
- Cascio, Peter J.
- Castle, E. S.
- Channing, Henry M.
- Claflin, Jr., William H.
- Coburn, Mr. R.W.
- Collins, Lester A.
- (To) Comrade, Department of Botany, University of California at Davis
- Conant, James B.
- Conzannelli, Andrew
- Couch, John
- Crider, John
- Crosby, Mrs. Stephen V. R.
- Curley, James M.

- Curley, Robert P.
- Cutler, Henry H.
- Dana, Edward
- Darlington, Cyril
- Deveney, John
- Dole, James D.
- Donald, Malcolm
- East, Mary
- Edmonds, Walter D.
- Fairchild, David [Missing]
- Farley, J. W.
- Farrand, Beatrix
- Farrington, E. I.
- Fillmore, Richard H., 19 May Street, Jamaica Plain, MA. January 31, 1952
- Forbes, W. Cameron, 160 Commonwealth Ave., Hotel Vendome, Boston, MA. 2 letters, December 3 and 6, 1952
- Frick, Childs, Roslyn, Long Island, New York. 2 letters, December 21, 1948 and February 2, 1952

Box 2

- Gilman, William, Middletown Springs, Vermont. July 16, 1955
- Goyne, William E., 99 Park Avenue, New York, New York. 2 letters, February 24, 1955 and March 1, 1955
- Greene, Jerome D., 54-A Garden Street, Cambridge, MA.
- Greenwood, H. L.
- Griggs, W. H.
- Guild, Henry
- Haffenreffer, A. H.
- Haffenreffer, Theodore
- Harding, W. G.
- Hatch and Little
- Hennessey, Capt. Francis J.
- Hern, Kevin
- Herter, Christian A.
- Hooper, W. P.
- Howard, Richard A.
- Hyland, George
- Johnson, Albert G.
- Johnson, W. Bradford
- Johnston, Ivan
- Kane, R. Keith
- Kaufman, C. M.
- Kevorkian, Arthur G.
- Kleebertger, Mrs. R.
- Kobuski, C. E.
- Lehmann, Ernst
- Lockard, C. R.
- Logue, Everett G.
- Long, William P.
- Lothian, T. R. N.
- Lowell, Alfred P.
- Lowell, Ralph
- M, J.B.

- MacArthur, General Douglas
- MacCready, Robert A.
- Mangelsdorf, Paul C.
- Massachusetts Horticultural Society
- McKelvey, Susan D.
- McReynolds, George E.
- Merrill, E. D.
- Meyer, F. G.
- Miculka, Ing. B.
- Millikan, D. F.
- Moe, Henry Allen
- Murphy, John J.
- Neel, James V.
- Nichols, Herbert
- Osborn, Frederick
- Page, Arthur W.
- Patterson, Robert W.
- Pauley, Scott
- Peabody, Amelia
- Pendell, Elmer
- Perry, R.V., Bursar, Harvard University
- Pinney, J. J.
- Potter, Mrs. Nathaniel B.
- Power, Frederic C.
- Prentice, E. Parmalee
- Pusey, Nathan
- Raup, Hugh M.
- Renshaw, Jeannette W.
- Reynolds, Edward
- Reynolds, James R.
- Robbins, William J.
- Rodgers, Lyndon
- Saltonstall, Richard
- Sampson, Dexter R.
- Sarton, George
- Schenck, Hubert G.
- Schultz, Milford D.
- Shattuck, Henry L.
- Shaw, O. M.
- Simon and Schuster
- Simonds, Herbert R.
- Sinnott, Edmund W.
- Slate, George L.
- Smith, Maude E.
- Smith, Howard N.
- Snyder, Laurence H.
- Solomon, Harry C.
- Stolp, D. W.
- Stover, Isabelle M.
- Suszka, Balestaur [Missing]
- Syngé, Patrick M.
- Taylor, Paul B.
- Thimann, Kenneth

- Tukey, H. B.
- Valvilov, Serge
- Verdoorn, Frans
- Vermeulen, J. Peter
- Walker, E. H.
- Wareham, Richard T.
- Washburn, Bradford
- Weeks, Edward A., Jr.
- Welsh, John H.
- White, Orland E.
- Whitehill, Walter H.
- Wilcox, Dr.
- Wilson, E. B.
- Wolcott, Oliver
- Wood, Henry A.
- Woolsey, John M.
- Wright, Lillian L. [Missing]
- Wyman, Donald
- Yanagisawa, Toshio
- Yu, Te-Tsun
- Zirkle, Conway

**Series III: Manuscripts
Folder**

- 1:** Effect of Temperature on X-Ray Induced Chromosome Aberrations, 1939-1941
- Sax, Karl and Enzmann, E.V. "The Effect of Temperature on X-ray Induced Chromosome Aberrations." Reprinted from the Proceedings of the National Academy of Sciences, Vol. 25, No. 8, 397-405, August, 1939
 - Sax, Karl. "Types and Frequencies of Chromosomal Aberrations Induced by X-Rays." Reprinted from *Cold Spring Harbor Symposia on Quantitative Biology* 9: 93-101, 1941
 - Table: Effect of temperature on X-ray induced chromatid and chromosome aberrations, with notes, undated
 - Table: Relation between X-ray dosage and frequency of induced half-chromatid aberrations, with notes, undated
 - Table: Effect of time of raying and dosage on the types and frequencies of X-ray induced chromatid aberrations, with notes
 - Table: Effect of X-ray intensity on chromosome and chromatid aberrations, with notes, undated
 - Table: Effect of time and dosage on the types and frequencies of X-ray induced chromatid aberrations during prophase of *Tradescantia* microspore nuclei, with notes, undated
- 2:** "The Induction of Half-Chromatid Aberrations in *Tradescantia*" (Revised).
c. 1950s
- 3:** [Sax, Karl.] "The Bussey Institution", undated
- 4:** "O.R.N.L. Advisory Committee for Biology"



Dwarfing experiment, undated (left); *Malus* dwarfing experiment, 1951 (center); "Juvenile Foliage", 1958 (right)

Series IV: Plant Records and Research

Box 3: Index Cards

- Index cards: 3 bundles of 5x8" index cards (approximately 700 cards)
 - A-Z plant notes
 - Colchicine notes
 - Crosses to be made notes
 - Heat treatment notes
 - Maternal inheritance notes
 - Segregation notes
 - Speciation notes
 - X-Ray notes

Box 4: Cytological Reviews, 1920-1928

- Notebook: "Reviews of Cytological Papers. Karl Sax". 1920-1928. Transferred from Harvard Botany Libraries to Archives of the Arnold Arboretum October, 2008. Formerly cataloged as Hollis #0063422302, includes catalog cards. 5.5x9" orange
 - Handwritten abstracts of cytological papers
 - Documentation of Sax's work on wheat hybrids while at the Maine Agricultural Experiment Station in Oromo from 1920-1928.
 - "Maine Agricultural Expt. Station - Corn Breeding", 2 annotated loose forms, one dated 1926
 - "Summary of Wheat Crosses", loose handwritten sheet
 - "The Smear Method for Plant Cytology", typewritten paper

Box 5: Cytological Reviews, 1923-1927

- Notebook: "Cytological Reviews." 1923-1927. Includes 2 pages of experiment notes, "Zirkle's Fixatives" and "Zirkle's Butyl Alcohol Dehydration." 6x8.5" gray and red

Box 6: Formulae and Methods, 1930s

- Notebook, untitled. c. 1930s. 5.5x8" black, 3-ring

- "Formulae" (general, killing and fixing fluids, stains)
- "Fixation and Staining Methods"
- "Paraffin Material – fixation and subsequent treatment"
- "Nicotiana Hybrids 7/31"
- "Linaria Crosses"

Box 7: Experiments, 1939-1941

- Experiment 2, September 21, 1939 - experiment 84, June 11, [1941] notes
 - Experiment 2. Behavior of broken ends of chromosomes in successive cell division. September 21, 1939
 - 3. Effect of dehydration on x-ray susceptibility. September 25, 1939
 - 5. X-ray effect on root tip chr. October 9, [1939]
 - 6. [Onion bulbs]. October 16, [1939]
 - 7. October 25, [1939]
 - 8. [Allium radiation]. October 25, [1939]
 - 9. Ray dry onion bulbs. October 27, [1939]
 - 10. Ray potted *Tradescantia* seedlings from [illegible] greenhouse. October 27, [1939]
 - 12. *Tradescantia* clone 374 [radiation]. October 27, [1939]
 - 20. *Tradescantia* clone [radiation]. November 14, [1939]
 - 23. [Onion radiation]. November 22, [1939]
 - 24. *Tradescantia* 374. Ray for physical effect of microspore and [illegible]. November 28, [1939]
 - 25. Onion bulbs dry rayed. November 28, [1939]
 - 28. *Tradescantia* S.B. clone. December 6, [1939]
 - 29. *Tradescantia* 374. To get fusions at various dosage. December 7, [1939]
 - 32. Dry onion bulbs rayed to get dosage curve, effect of time factor and [illegible] of broken ends. January 2, [1940]
 - 37. Ray root tips onion. January 22, [1940]
 - 38. Intermittent timing *Tradescantia* 374 clone. January 22, 1940
 - 39. Dry onion [radiation]. February 11, 1940
 - 40. Temp. effect on primary x-ray effect. February 2, 1940
 - 41. *Tradescantia* clone 374. Intermittent timing. February 5, [1940]
 - 42. Onion seeds. February 16, [1940]
 - 43. Onion bulbs. February 16, [1940]
 - 44. Clone 374. February 21, [1940]
 - 47. Fractional dosage. February 29, [1940]
 - 48. Clone 374. March 4, [1940]
 - 49. Effect of rest period on delayed fusion. n.d.
 - 50. Fractional dosage. March 28, [1940]
 - 51. Rayed *Tradescantia* plant roots in pot to compare root chromosome sensitivity with microspores. March 12, [1940]
 - 52. Time factor. March 15, 1940
 - 53. Rayed *Tradescantia* (C.P.S.) 4 minutes. March 17, [1940]
 - 54. *Tradescantia* [radiation]. March 26, [1940]
 - 56. Rayed dry onion bulbs 10 minutes. March 26, [1940]
 - 57. *Tradescantia* 374 rayed in upturned pots 10 minutes. April 16, [1940]

- 58. *Tradescantia paludosa*. Effect x-ray on water content. April 26, 1940
- 59. Rayed *Tradescantia* 374 root tips. May 1, [1940]
- 60. *Tradescantia* 374. Rayed 3 minutes. May 1, [1940]



Photographs of dwarfing experiments. McIntosh/ *Malus sargentii* 'Rosea'/ *Malus sikkimensis* knotted cross at 4 years (right). 1950s

Box 8: Crossing Index, 1943-1959

- Notebook: "Crossing Index." 1943-1959. 6x8.5" gray and red

Box 9: Medical Journals List, 1941-1945 and X-Ray Experiments, 1950-1954

- Notebook: "Medical Journals". 8.5x14" gray
 - List of journals acquired 1941-1945 including medical, public health, war medicine, chemical, and industrial publications
 - Summary of root stock work, 1944-1953
- Notebook: "X-ray Cash". 8.5x14" gray
 - X-ray experiment data, 1950-1954
 - Bulb radiation experiment data, 1953-1954

Box 10: Colleagues and Experiments on Rooting of Cuttings

- Notebook: "Cytology Slide Index." 6x8.5" gray and red
 - Alphabetical list of colleagues and affiliations
 - Experiments on rooting of cuttings, 1959

Box 11: Notes, Alphabetical A-C, 1942-1952

- Fruit of apples in far field and nursery Fall 1944
- Apples 1947
- Apple for Weston 1946
- Apple trees - Walter St. Nursery 1942
- Commercial apples on various root stock
- Commercial apple seedlings September 1948
- Hybrid sterility 1943
- Hybrid apples 1947
- *Malus* 1948
- Plot 2 - plot 5. Apple root stocks 1946
- Root stock experiments. Apples

- Commercial apples, September 1948
- Emswellers Dwarf azaleas, May 1952
- Dwarfing effect of bark ring
- Tags bark ring
- *Berberis mentorensis* 1944
- Broccoli 1943-1947
- Budding Aug. Corn Nursery 1940
- Budding Aug. 1949. G.H. Nursery
- Budding Nursery 1945
- Pine budding 1947
- Budding record 1946
- Budding schedule (Large Plantation) 1948
- Celery 1947
- Cherries 1944
- *Philadelphus* – Colchicine treated
- Colchicine treated *Philadelphus* 1944
- Poplar – colchicine 1943
- Colchicine techniques

Box 12: Notes, Alphabetical C-N, 1939-1949

- Francis Colnan's address
- Potted species for crossing in greenhouse
- For distributions & test
- Elm types 1947 experiments
- Chiasma frequency fertile and sterile 1948. $4n$ elections grown in 1949
- Fertile and sterile $4n$ lines 1948. Pollen sterility
- V_2 bomb – Whipple. Fertility/sterility 1947
- Fertilizer test. Garden plot 1947
- Effects of long exposure to gamma rays. Experiment 1-7
- Bark graft experiments 1948
- Graft compatibility Fall 1946
- [Grafts] cultivar Weston. 1 year whips 1949
- Grafting experiment – upside down
- Michurin experiment
- Sax, from T. Mitchell correspondence 1944
- Spring 1949 notes
- Notes 1939
- Notes Fall 1949
- 1945 *Toringoides* nursery
- Nursery plots Fall 1947
- Nursery Spring 1948



Photographs of dwarfing experiments from Box 15, Envelope 2. Unlabeled, undated. 1950s

Box 13: Planting Indices, 1940-1955

- Plantings for the season of 1940
- Plantings for the season of 1941
- Plantings for the season of 1942
- Planting index 1942 seeds
- Planting index 1943 for 1944 crop
- Planting index - 1946
- Planting index - 1947
- Planting index - 1948
- Planting index - 1949
- Planting index - 1950
- Planting index - 1951
- Planting index - 1952
- Planting index - 1953
- Planting index - 1954
- Planting index - 1955

Box 14: Notes, Alphabetical P-W, 1943-1952

- Poplar rings - July 9, 1948
- Projects 1943-1944
- Projects 1948
- Projects 1950
- Root stock experiments 1947
- Root stock experiments
- Rose propagating bed
- Rose hybrids - discarded 1943
- Stem & trunk basal applications
- Sweet corn 1946
- Sweet corn test 1946
- Sweet corn 1947
- Sweet corn 1948 Bussey plot
- Sweet corn 1948 & center Bussey plot 20
- Sweet corn 1948. Poplar field

- Sweet corn test August 22, 1948
- Sweet corn 1949
- Sweet corn 1950-1952
- Seed for 1948
- Fall 1948 1 year growth of own root seedlings on 2 year root vs. same seedling
- Seedlings Fall 1949
- Pollen sterility – 1949. Rocket bomb July 8
- 1945 tomato
- Toringoides nursery 1945
- Wheat 1943-1946
- [Unlabeled, undated notes and chart]



Photographs of dwarfing experiments from Box 15, Envelope 2. Unlabeled, undated. 1950s

Box 15: Photographs

- A-3303. "Dwarf fruit trees. 8-17-50. Photo for Dr. Sax by H. Howard. Valencia Peach on *P. [Prunus] tomentosa* 6' tall 80 peaches"
- CW 583. "Juvenile Foliage. Photo used in article by Dr. Sax, *Arnoldia* Vol. 18, No. 1"
- CW 584. "Poison Ivy experiment by Dr. Sax 1955. "Ivy Kill" applied to vine on Maple in front of Adm. Bldg. Treated 3 weeks before photos taken"
- CW 585. "Poison Ivy experiment by Dr. Sax 1955. "Ivy Kill" applied to Maple in front of Adm. Bldg. Treated 3 weeks before photos taken"
- "Dr. Sax experiments." Undated
- "Mc. [McIntosh]/sarg. [*Malus sargentii* 'Rosea'] knotted/sik. [*Malus sikkimensis*] 4 yr."
- "Pear/*Photinia* 5 yr. 3 yr. Clapp and Buschinelli[?]"
- "Pear/*Photinia* 5 yr. 3 yr. Clapp and Buschinelli[?] 1955. Best."
- R-2635. "Dwarfing experiments by Dr. Sax. *Malus* #20139 Sax-CE – U.D. ring June 1954 12 years old 1954"
- R-2637. "Dwarfing experiments by Dr. Sax. McIntosh/sik. [*Malus sikkimensis*] 1952. *M. sik.* [*Malus sikkimensis*] knotted in June 1951. Budded above knot Aug. 1952. Note suckers"

- R-2769. "Dwarfing experiments by Dr. Sax. Winter Banana/524/sik. [*Malus sikkimensis*] Control 5 years old 1955"
- R-2770. "Dwarfing experiments by Dr. Sax. Winter Banana/524/sik. [*Malus sikkimensis*] U.D. 1954 5 years old 1955"
- R-2771. "Dwarfing experiments by Dr. Sax. *Acer plat.* [*platanoides*] "Crimson King" on *Acer saccharinum* 6 years old 1957"
- R-2772. "Dwarfing experiments by Dr. Sax. *Malus sikkimensis* seedling 1951, Knotted 1951, Photo taken Spring 1954"
- R-2773. "Dwarfing experiments by Dr. Sax. *Malus sikkimensis* sdlg. [seedling]. Knotted 1951. Photo taken 1954"
- R-2774. "Dwarfing experiments by Dr. Sax. Baldwin [*Malus domestica 'baldwin'*]/Ott. 524/sik. [*Malus sikkimensis*] U.D. 1953-55 7 years old 1957"
- R-2775. "Dwarfing experiments by Dr. Sax. Clapp pear (*Pyronia*) *M. sik.* [*Malus sikkimensis*] 2 years old 1957"
- R-2776. "Dwarfing experiments by Dr. Sax. McIntosh (right) Baldwin [*Malus domestica 'baldwin'*] (left) on EM IX 10 years old 1957"
- R-2777. "Dwarfing experiments by Dr. Sax. Foley Peach/[*Prunus triloba/tomentosa*] 2 years old 1957"
- R-2778. "Dwarfing experiments by Dr. Sax. McIntosh knotted/sikk. [*Malus sikkimensis*] 6 years old 1957"
- R-2779. "Dwarfing experiments by Dr. Sax. *Cotoneaster adpressa praecox* on *Crat.* [*Crataegus phaenopyrum*] 1 year old"
- R-2780. "Dwarfing experiments by Dr. Sax. McIntosh/EM IX/sik. [*Malus sikkimensis*], U.D bark 1955, Laced branches 1956, 76 fruits 1957"
- R-2781. "Dwarfing experiments by Dr. Sax. *Cotoneaster adpressa praecox* on *Crat.* [*Crataegus phaenopyrum*], 1 year old 1957"
- R-2782. "Dwarfing experiments by Dr. Sax. Peach, plum, apricot, Cherry/*P.* [*Prunus triloba*] 1 year old 1957"
- R-2783. "Dwarfing experiments by Dr. Sax. Nova Scotia Golden/EM IX/sik. [*Malus sikkimensis*] 4 years old"
- R-2784. Dwarfing experiments by Dr. Sax. Apricot/ [*Prunus triloba/tomentosa*] 1 year old 1957"
- R-2785. "Dwarfing experiments by Dr. Sax. Stayman/Mc. [McIntosh]/sik./33340 2 yr. dead in August. On 33340 Stayman grows about 6" first year and dies. 1957"
- R-2786. "Dwarfing experiments by Dr. Sax. Baldwin [*Malus domestica 'baldwin'*]/*M. sik.* [*Malus sikkimensis*] 1951, Double U.D., bark. June 1952, Flowered and fruited 1953"
- R-2787. "Dwarfing experiments by Dr. Sax. McIntosh/sik. [*Malus sikkimensis*] (knotted 1st year) 5 years old 1957"
- R-2788. "Dwarfing experiments by Dr. Sax. Foreground – Baldwin [*Malus domestica 'baldwin'*]/33340 6 yrs. 1957 had 15 fruits, Background – Bald. [*Malus domestica 'baldwin'*]/33340 sik. [*Malus sikkimensis*] 6 yrs. 1957 had 81 fruits"
- R-2789. "Dwarfing experiments by Dr. Sax. McIntosh/EM IX/*sarg. rosea* [*Malus sargentii 'Rosea'*] 3 years old 1957"
- R-2791. "Dwarfing experiments by Dr. Sax. Cortland Apple on *M. sik.* [*Malus sikkimensis*] 1949, Double inversion 1950, Flowered 1951, Fruit in 1952, '53, Practically no growth in 5 years"
- R-2792. "Dwarfing experiments by Dr. Sax. Stanley Plum/*P.* [*Prunus tormentosa*] 10 years 1957, approx. 250 fruits"

- R-2793. "Dwarfing experiments by Dr. Sax. Late flowering Vc Apple about 5 years old. Double U.D. graft. June 1953"
- R-2794. "Dwarfing experiments by Dr. Sax. Baldwin [*Malus domestica 'baldwin'*]/524/*M. sik.* [*Malus sikkimensis*] Double U.D. 1952, Flowered and fruited 1953"
- R-2990. "Dwarfing experiments by Dr. Sax. McIntosh/*sik.* [*Malus sikkimensis*] knotted. 6 years old 1957"
- R-3013. "Dr. Sax's dwf. [dwarf] fruits (Hale Haven/*tom.* [*tomentosa*] '50) H. fruit by H.H. [Heman Howard] 8/12/1959"
- R-3015. "Dr. Sax's dwf. [dwarf] fruits (Bald. [*Malus domestica 'baldwin'*]/17039/*sik.* [*Malus sikkimensis*] '51 U.D Bark) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3016 "Dr. Sax's dwf. [dwarf] fruits (Mc. [Mcintosh]/*sarg.* [*Malus sargentii 'Rosea'*] '51) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3017 "Dr. Sax's dwf. fruits (Stanley [Plum]/*Tom.* [*tomentosa*] '48) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3018 "Dr. Sax's dwf. fruits (Cox/9/*sik.* [*Malus sikkimensis*] '54) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3019. "Dr. Sax's dwf. fruits (Bald. [*Malus domestica 'baldwin'*]/33340, '51) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3020. "Dr. Sax's dwf. fruits (Bald. [*Malus domestica 'baldwin'*]/33340/*sik.* [*Malus sikkimensis*] '51) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3021. "Dr. Sax's dwf. fruits (Bald. [*Malus domestica 'baldwin'*]/9/*sarg. rosea* [*Malus sargentii 'Rosea'*] '55) H. fruit by H.H. [Heman Howard] 8/13/59"
- R-3022. "Dr. Sax's dwf. fruits (early Mc. [McIntosh]/*sarg. rosea* [*Malus sargentii 'Rosea'*] '55) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3023. "Dr. Sax's dwf. fruits (Bald. [*Malus domestica 'baldwin'*]/8/*sarg. rosea* [*Malus sargentii 'Rosea'*] '57) H. fruit by H.H. [Heman Howard] 8/12/59"
- R-3024. "Dr. Sax's dwf. fruits (Vakima/*Tom.* [*tomentosa*] '55) H. fruit by H.H. 8/12/59"
- "Sax 6-57. Baldwin [*Malus domestica 'baldwin'*]/8 in./33340 3 yr. old"
- "Stanley [Plum]/*tom.* [*tomentosa*] 5 yr. '55"
- 13 Unlabeled, undated photographs of dwarfing experiments
- Envelope 1: Cross-sections. Unlabeled, undated. Circa 1950s
 - 6 photographs of woody stem or branch cross-sections
 - 5 negatives of woody stem or branch cross-sections
- Envelope 2: Dwarfing experiments and cross-sections. Unlabeled, undated. Circa 1950s
 - 8 photographs of dwarfing experiments
 - 15 photographs of woody stem or branch cross-sections
- Envelope 3: Woody stems. Undated. Circa 1950s
 - 4 photographs of woody stems, labeled "Group I", "Group II", "Group III", and "Group IV"
 - 1 photograph of wood cross-section, unlabeled
- Envelope 4: Conifer
 - 1 glass slide of a conifer cell? Labeled "conifer", undated
 - 1 photograph of a conifer cell? Unlabeled, undated
- 8x10" photograph of the *Salix* meadow. Undated

Box 16: Planting Indices 1938-1942

- "Book #1 1938-1939" with planting dates and notes. Plant #s 138-38439. 7x8.5" black and red book
- "Book #2 1939: 38539" with planting dates and notes. Plant #s 38539-62539. Includes charts of 1939 fixations with comments and charts of 1940 crossing experiments with comments. 7x8.5" black and red book
- "Plantings for the season of 1940." Planting notes July, 1939 - April, 1940. Includes charts showing crossing experiments June 6, 1940 - August 19, 1940 with comments. 7x8.5" black and red book
- "Plantings for the season of 1941." Planting notes July, 1940 - August, 1941. Includes charts showing crossing experiments. 7x8.5" black and red book
- "Plantings for the season of 1942." Planting notes August, 1941 - August, 1942. Includes charts showing crossing experiments. 7x8.5" black and red book

Box 17: Planting Indices 1942-1955

- "Planting Index." 6x8.5" black and red book. Includes:
 - "Planting Index 1942 seeds"
 - "Planting Index 1943 for 1944 crop"
 - "Index 1944"
 - "1945 Planting List"
 - "Planting Index 1946"
 - "Texas Rose cuttings. May 1, 1947"
 - "Planting 1948"
 - "Planting 1949"
 - "Planting 1950"
 - "Seed sown Jan. 1950"
 - "Planting 1950"
 - "1952"
 - "1953"
 - "For 1954"
 - "1955 Planting List"
 - "Planting 1956"
 - "1957"
 - "1959"

Box 18: Plant Accession Records

- Plant accessions, *Abelia* - *Stewartia*. 14x9" black and red book. No date
- Plant accessions, *Sambucus* - *Syringa*. 13.5x9" black and red book. No date

Box 19: Notes on Pollen, Seed, and Maturation, 1938-1954

- "Record" book with notes on pollen, seed, and maturation. 5x8" black and red book. 1938-1942

Box 20: Pollinating Reports, 1952-1957

- Pollinating reports, 1952-1956 arranged alphabetically by genera in 6x11.5" accordion file
- Pollinating reports, 1953-1957 arranged alphabetically by genera. Loose sheets from disbound book

- Notes: "*Malus sargentii*: Polyploidy, apomixes, and genetics in hybrids." Ca. 1954
- Correspondence: Martha Lee, Chief Propagator, Morris Arboretum to Jeanette Renshaw, Arnold Arboretum regarding *Malus sargentii* and *Forsythia*. September 29-December 23, 1954
- Notes: Seeds sent and received, 1955-1958

Box 21: Blooming Schedule, 1958

- "Weekly Reminder" book showing plants in bloom January 7-April 11, 1958

Box 22: Nursery Records, 1950-1958

- 7.5x10" gray 3-ring binder
 - "Large nursery. Fall 1950" plantings by row
 - "Bussey G.H. nursery. Fall 1950" plantings by row
 - "Greenhouse plants labels"
 - "For friends"
 - "Arboretum 1951 or 1952"
 - "Weston-1951"
 - "Large nursery. Spring 1951"
 - "1951 nursery. Large plot-G.H. area"
 - "1951 grafting test. Virus [?]"
 - "Lower GH nursery 1951"
 - "Budding program 51 Maples"
 - "Peaches and plums. Budding program 51"
 - "Budding program 51 Apples"
 - "Ring graft exp. [experiments]"
 - "Dwarf trees Weston"
 - "Dwarf tree Bussey Garden"
 - "Trees budded in 1951"
 - "Lower nursery Fall 51"
 - "Effect of interstock length"
 - "Fall [?] nursery"
 - "Results of budding maples on Silver Maple seedling Aug. 1951"
 - "Budding program 1952"
 - "Greenhouse nursery Fall 1952"
 - "Middle curved bed below nursery 1952"
 - "Lower beds - farther plot 1952"
 - "Far nursery Fall 1952"
 - "Far nursery 1953"
 - "Shaded bed 1953"
 - "Third curving bed below Greenhouse end towards Poplars 1953"
 - "Shaded bed near Greenhouse 1954"
 - "Shaded frame 1954"
 - "Greenhouse nursery 1954"
 - "1954 frame next to shaded frame"
 - "Far nursery 1954"
 - "Bed next to Greenhouse beginning at potting shed Spring 1955"
 - "Near nursery 1955"
 - "1955 second curving bed below near nursery"
 - "1955 third curving bed below near nursery-far end"
 - "1955 under shade by Greenhouse"
 - "Frame 1955"
 - "Front row next to shade 1955, 1956"

- "Across path from curving beds next to State Lab fence 1955"
- "1955 plot near Bussey building beginning towards greenhouse"
- "Far field 1955"
- "Far nursery 1955"
- "Far nursery 1956"
- "Near nursery 1956"
- "Shade near Greenhouse 1956"
- "Frame 1956"
- "Shade near Greenhouse 1957"
- "Far field 1957"
- "Near nursery 1957"
- "Shade near Greenhouse 1958"
- "Near nursery 1958"
- "Far field 1958"
- "Next to Greenhouse beginning near door 1958"
- "Dwarf tree exp. [experiments] Weston root stock nursery planted May, 1952. 15x15 ft."
- "Dwarf stocks & reserves Weston 1951"
- "Test of Michurin [?] graft hyb. [hybrid]"
- "Soil condition exp. [experiment] July 2"
- "Fruits hyb. [hybrid] apples Fall 1950"

**Box 23: Miscellaneous
Folder**

1: Administration, 1948-1956 and No Date

- Appeal to Friends of the Arnold Arboretum for financial contributions. April 1948
- "Memo on Bussey status." Three-page typewritten report on the intended and actual use of Bussey Institution land. Undated
- Notes: Excerpt from President Eliot's report 1871-1872 on the Arboretum's endowment. Undated
- "The Program of the Arnold Arboretum." Notes on the mission and activities of the Arboretum, with revisions. October 22, 1956

2: Gypsy and Brown-tail Moths, 1950-1957

- Instructions to the Shipper, Parcel Post Importations. Plant Protection Division Ottawa, Canada Department of Agriculture, undated
- Notice to Importer: Plants, etc. from Gypsy and Brown-tail Moth Areas. W.N. Keenan, Chief, Division of Plant Protection Ottawa. August 1, 1950
- Certificate of Inspection from Country of Origin. W.N. Keenan, Chief, Division of Plant Protection Ottawa. December 21, 1956
- Map: Gypsy Moth and Brown-tail Moth Quarantine Regulated Areas Revised May 1957. Plant Pest Control Division, U.S. Department of Agriculture
- Phytosanitary Export Certificate. Plant Quarantine Branch, U.S. Department of Agriculture. July 23, 1957

3: Radiation Contamination Testing, 1954

- Record of laboratory contamination check and blood counts for Sax and Edward King: "Harvard University Continuing Record of Precautions to Protect Health and Prevent Laboratory Contamination." June 7, 1954. Two copies

4: Horticulture Teaching Guide, with Notes. c. 1956

- *Gymnospermae* - The Gymnosperms
- *Ginkgoaceae* - Ginkgo Family

- *Taxaceae* – The Yew Family
- *Pinaceae* – The Pine Family
- Principal genera in New England
- Key to the Commonly Cultivated Genera of the Pine Family in New England
- *Magnoliaceae* J. St. Hill. Magnolia Family
- Descriptive Pattern for a Flowering Plant
- Names of Leaf Patterns
- *Rosaceae* Juss. – Rose Family
- Inflorescence and Flower Types
- Key to Fruit Types
- *Cruciferae* – The Crucifers
- *Geraniaceae* – Geranium Family
- *Pelargonium* – Storksbill
- *Hamamelidaceae* Lindl. – Witch-hazel Family
- *Hamamelis* L. – Witch-hazel
- Further terminology for the perianth (above)
- *Leguminosae* – The Pea Family
- Trends of Specialization in Flowering Plants
- Suggested Relationships of Families of Flowering Plants (*Dicotyledoneae*)
- Suggested Relationships of Flowering Plants (*Monocotyledoneae*)
- Descriptive Pattern for a Flowering Plant
- The Amentiferae and Early Flowering Trees
- Propagation of Plants by Budding
- Plant Breeding
- Plant Propagation: The Use of Polyethelene Plastic in Rooting Softwood Cuttings at Home
- The Propagation of Plants by Topworking
- Propagation of Plants by Whole and Piece Root Grafting
- Propagation by Layering

5: Notes on Sax's Departure by Richard Howard, September 1959

- One-page typewritten summary of Sax's retirement on August 30, 1959 by Richard Howard. September 1959

6: Opinion on Scott S. Pauley and Hugh Miller Raup, No Date

- Two-page typewritten opinion on the character and abilities of Scott S. Pauley and Hugh Miller Raup, Harvard Forest. Undated

7: Feulgen Method, No date

- Notes on the Feulgen method of nuclear stain. Includes notes on the preparation of stain, directions, and references. Undated

Oversize Folder: Bussey Institution Photographs

- 2½ x 3½" photograph of the Bussey Institution, undated
- Clippings from Sax's article "[The Bussey Institution: Harvard University Graduate School of Applied Biology 1908-1936](#)" published in the *Journal of Heredity*, 1966
- 7 x 13" photograph of Bussey Institution geneticists assembled at the Sixth International Congress of Genetics at Cornell University, 1932. This photograph was published in Sax's article "[The Bussey Institution: Harvard University Graduate School of Applied Biology 1908-1936](#)", *Journal of Heredity*, 1966
- 6½ x 8½" photograph of Karl and Hally Sax with staff at unidentified institution, undated