



Smithsonian
National Museum of American History
Kenneth E. Behring Center

Guide to the Marvin E. Mundel Industrial Engineering Collection

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Tina Glengary.

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Collection Overview

Repository:	Archives Center, National Museum of American History
Title:	Marvin E. Mundel Industrial Engineering Collection
Identifier:	NMAH.AC.0676
Date:	1937-1996
Extent:	15 Cubic feet (36 boxes) 75 motion picture films
Creator:	Mundel, Marvin Everett, 1916-1996 (industrial engineer)
Language:	English One film is in Japanese. Collection is in English.
Summary:	The Marvin E. Mundel Industrial Engineering Collection contains correspondence, reports, data, notes, publications, books, charts, certificates, awards, writings, photographs, films and videos that document the life and career of Marvin Mundel, a well-known expert in the field of work management and productivity enhancement.

Administrative Information

Acquisition Information

This collection was donated to the Archives Center at the National Museum of American History by Marvin Mundel's wife, Takako Mundel, in January, 1999.

Processing Information

Processed by Tina Glengary (intern) 1999; supervised by Alison Oswald, archivist.

Preferred Citation

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Restrictions

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Biographical / Historical

Marvin Everett Mundel, born April 20, 1916, was a major figure in the fields of industrial engineering and time and motion studies. He is known particularly for his consulting work, seminars and teaching, as well as numerous publications based on his expertise in work management and productivity enhancement. He began his engineering career in 1936 with a B.S. in Mechanical Engineering from New York University (1936), followed by an M.S. and Ph.D. in Industrial Engineering earned in 1938 and 1939, respectively, from the State University of Iowa.

In the late 1930s and 1940s, work measurement studies were considered the state-of-the-art method for improving industrial production. Mundel continued and built upon the achievements of pioneers Frank and Lillian Gilbreth during his teaching career at both Bradley and Purdue Universities. He also conducted seminars at Marquette University Management Center and the University of Wisconsin's Extension Center in Milwaukee. In addition to his American teaching career, Mundel was a visiting professor at both the University of Birmingham in England and Keio University in Tokyo, Japan.

In 1952, Mundel started a consulting firm which aided corporations and governments in either work measurement consulting or, later in his career, industrial engineering consulting. His first clients were United States government agencies that wanted to gain control over lost revenue or manpower. His position from 1952 to 1953 at the Rock Island Arsenal in Illinois, as the first Director of the Army Management Engineering Training Program, transformed management techniques in the Army.

After his employment at Rock Island, Mundel began a series of consultant roles with corporations eager to standardize labor practices and make production more efficient. From 1953 to 1963, Mundel conducted time and motion studies at various manufacturing companies and developed techniques to measure work units. His most important contribution to the field of time and motion study was the development of memomotion, a stop-action filming technique used to determine time standards for work tasks.

Following his refinements of time and motion study, Mundel took his expertise to Japan where he offered his consultant services to various Japanese manufacturing firms during the 1960s. His interests evolved from time and motion studies to include work management and overall management organization consulting. During the 1960s and 1970s, Mundel also returned to government consulting in the United States with these new techniques, in offices such as the Bureau of the Budget and United States Department of Agriculture. This period marked an important evolution in Mundel's career, from time and motion study to work measurement and then to industrial consulting. Mundel was among the first consultants to export American management techniques to Japan, and, in his later career, to other Asian countries. He became an integral part of the Asian Productivity Organization, a group that helped developing Asian countries learn how to increase productivity. His seminars sought to provide corporations and governments with efficient management techniques so that Asia would become a strong economic center. Mundel was sensitive to cultural differences as well as varied methods of management and standards of productivity.

Mundel won the Gilbreth Award in 1982. He continued conducting seminars and writing books and articles well into the 1980s, until failing health prevented him from traveling. When Mundel died in 1996, he was well respected in the field of industrial engineering for his many contributions.

Scope and Contents

The Marvin E. Mundel Industrial Engineering Collection contains correspondence, reports, data, notes, publications, books, charts, certificates, awards, writings, photographs, films and videos that document the life and career of Marvin Mundel and demonstrate his work practices and teaching techniques.

The collection is organized chronologically into eleven series: Biographical Materials, Writings, Industrial Engineering, Work Methods, Purdue University, Time and Motion Study, Government Work, Japanese Consulting, Asian Productivity Organization, Dupont Case Study, and Films and Videos. While the years in each series may overlap, the separation of series demonstrates the evolution of Mundel's work and teachings. Photographs can be found throughout the collection. Information about the film and video series is located in Appendix A.

Series 1, Biographical Materials, 1953-1996, consists of documentation about Mundel and his career. The series contains bibliographies and curriculum vitae, correspondence, documentation on his memberships in Industrial Engineering groups, photographs, and certificates.

Series 2, Writings, 1937-1994, brings together Mundel's papers, speeches, books, and publications. When possible, the writings are arranged chronologically. The remaining writings are arranged by topic. This series should not be considered a definitive bibliography of Mundel's writings.

Series 3, Industrial Engineering, 1954-1995, combines Mundel's research with correspondence to and from other Industrial Engineers. It also includes Mundel's contributions to the Encyclopedia Britannica on "Industrial Engineering," "Work Measurement," and "Memomotion."

Series 4, Work Methods, undated, contains documents such as forms, office procedure manuals, visual aids, and printed matter about office equipment that offer insight into Mundel's work methods and innovative methods of making his own office more efficient.

Series 5, Purdue University, 1951-1957, documents his teaching career at the Industrial Engineering Department as well correspondence from his trip to England where he taught classes on industrial engineering.

Series 6, Time and Motion Study, 1952-1984, includes notes, data, printed matter, correspondence, charts, and photographs from his consultant work for various companies. This series contains seven subseries: Subseries 1, Consulting Work, 1954-1966; Subseries 2, Correspondence, 1956-1960; Subseries 3, Course work, undated; Subseries 4, Equipment, undated; Subseries 5, Film, 1952-1984; Subseries 6, Memberships, 1970-1977; and Subseries 7, Research, 1957.

Subseries 1, Consulting work, 1954-1966, contains correspondence and data from the corporations that hired Mundel as a consultant. Subseries 2, Correspondence, 1956-1960, the contains letters to and from people with diverse interests in time and motion study. Many people wrote to Mundel asking for advice with projects. Visual aids and handouts make up Subseries 3, Course work. In order to create memomotion, Mundel needed to refine certain electrical and motor parts on the cameras and projectors with which he worked. Subseries 4, Equipment, undated, have brochures on many different kinds of motors and switches. Subseries 5, Film, 1952-1984, contains most of the documentation that relates directly to films and video cassettes in this collection. Mundel was active in many organizations related to industrial engineering that shared his interests in time and motion study. Finally, copies and clippings make up the research subseries, 1957.

Series 7, Government Work, 1952-1971, documents Mundel's work for the government, from his work at Rock Island Arsenal to seminars for NASA. This series contains correspondence, data, reports, course work, visual aids, and photographs. The consulting work is arranged in a chronological manner and, in some instances, alphabetically.

Series 8, Japanese Consulting, 1959-1987, documents Mundel's consulting work for Japanese corporations. The files are arranged alphabetically by company and contain research, data, charts, notes, reports, and correspondence about each manufacturing firm. His notebooks and trip files give insight into his cultural understanding of Japanese firms and his teaching practices. Of special interest are the notebooks that contain photographs and firsthand experiences of adapting to Japanese culture and understanding Japanese work practices.

Series 9, Asian Productivity Organization, 1973-1994, consists of year and country files of Mundel's seminars throughout the Far East. The course work, notes, visual aids, reports, and photographs demonstrate Mundel's shift in emphasis from work measurement to managerial organization. This series also contains books published by the Asian Productivity Organization (APO) that give a context to Mundel's work and writings.

Series 10, Dupont Case Study, 1978-1984, contains correspondence, data, notes, reports, research, and visual aids concerning one of the many American companies where Mundel consulted. Dupont was selected because of its prominence in the American business world.

Series 11, Films and Videos, circa 1939-1973, is comprised of 16mm films and 1/2" VHS videocassette tapes. The bulk of the series is 16mm films. The films relate to the documents in Series 6: Time and Motion Studies. There are six subseries: Rating Films, 1939-1973; Memomotion Films, circa 1948-1959; Multi-Image Loops, circa, 1956-1958; Instructional Films, circa 1939-1962; Travel Films, circa 1955-1958 and Papers, undated.

Films are labeled either OF, RF, OV, or RV, for Original Film, Reference Film, Original Video, and Reference Video, respectively. [Example: For "676.24 OF Roll Edge on Sheet Metal Disc, circa 1960 (REF. FILM 676.24 and REF. VIDEO 676.70)," 676 is the collection number; 24 is the item number; OF means original film; "Roll Edge on Sheet Metal Disc" is the title; 1960 is the date followed by any reference copies. In this case there are both a reference film and a reference video. The Archives Center will eventually have reference copies for all of the films. for researchers to view.

Subseries 1, Rating Films, circa 1939-1973, represents Mundel's work with rating or pace films. This technique films a worker doing a repetitive work unit and allows trained motion study analysts to establish time standards. These films show a wide variety of jobs held by both men and women, American workers and Japanese workers. There are three groups of films:

Demonstration Rating Films: These films have the same format as titles with 10 scenes of workers doing a work unit at different paces. The films are arranged according to Mundel's numerical system and retain the original titles. These films should be projected at 1000 frames per minute.

Poultry Rating Films: These are rating films that Mundel did for the USDA and the Consumer Protection Programs.

Miscellaneous Films: These are Mundel's rating films for Tung Sol, ASF, Woods Veterans Hospital, and Montfort. There is also a rating film taken by an English company.

Subseries 2, Memomotion Films, circa 1948-1959, includes memomotion examples that were incorporated into instructional films. Memomotion is a filming technique created by Mundel. Time and motion analysts film a non-repetitive or extended crew activity at one frame per second and then project the film at normal speed. In this manner, the analyst can record a longer work period at a fraction of the cost and be able to analyze the film much more quickly. Memomotion is often used in conjunction with work flow diagrams.

Subseries 3, Multi-Image Loops, circa 1956-1958, combines seven of Mundel's multi-image loops onto one film core. The films display twelve images of rating films at the same time. The worker in each image is working at a different pace (fastest in the top left-hand corner and the slowest in the bottom right-hand corner). Time and motion study analysts could watch the loops for as long as they needed to get an idea of what the range of paces for a certain job could be. The loops were disassembled and spliced together for preservation and viewing purposes.

Subseries 4, Instructional Films, circa 1939-1962, includes Mundel's attempts to educate others about his filming techniques and overall industrial engineering themes. The films teach ways to improve

productivity through motion studies, how to make memomotion films, and the College of Technology, Birmingham, England's method of making microscope slides.

Subseries 5, Travel Films, circa 1955-1958, includes films that combine Mundel's love for travel and different cultures with film documentation of Japanese seminars.

Subseries 6, Papers, undated, contains papers directly related to the films. Of importance are the rating sheets which associate different percentages of efficiency to the paces in the film.

Arrangement

This collection is divided into eleven series.

Series 1, Biographical Materials, 1953-1996

Series 2, Writings, 1937-1994

Subseries 1, Books, 1942-1994

Subseries 2, Papers, 1959-1989, undated

Subseries 3, Publications, 1937-1993, undated

Subseries 4, Speeches, undated

Subseries 5, University of Iowa Studies, 1938-1940

Series 3, Industrial Engineering, 1954-1995

Series 4, Work Methods, undated

Series 5, Purdue University, 1951-1957

Series 6, Time and Motion Study, 1952-1984

Subseries 1, Consulting Work, 1954-1966

Subseries 2, Correspondence, 1956-1960

Subseries 3, Course Work, undated

Subseries 4, Equipment, undated

Subseries 5, Film, 1952-1984

Subseries 6, Memberships-Industrial Management Society, 1970-1977

Subseries 7, Research, 1957

Series 7, Government Work, 1952-1971

Subseries 1, General, 1955-1967, undated

Subseries 2, Rock Island Arsenal, 1952-1958

Subseries 3, Consulting, 1959-1971

Subseries 4, Seminars, 1963-1969

Series 8, Japanese Consulting, 1959-1987

Subseries 1, Consulting, 1961-1980

Subseries 2, Correspondence, 1959-1980

Subseries 3, Keio University, 1960-1961

Subseries 4, Memberships, 1959-1987

Subseries 5, Notes, undated

Subseries 6, Photographs, undated

Subseries 7, Scrapbooks, 1960-1965

Subseries 8, Seminars, 1959-1967

Series 9, Asian Productivity Organization, 1973-1994

Subseries 1, Annual Reports, 1973-1994

Subseries 2, Books, 1985-1989

Subseries 3, General, 1976-1995, undated

Subseries 4, Seminars, 1973-1989

Subseries 5, Presentation Album of Jakarta Seminar, 1973

Series 10, DuPont Case Study, 1978-1984

Series 11, Films and Videos, circa 1939-1973

Subseries 1, Rating Films, circa 1939-1973

Subseries 2, Memomotion Films, circa 1948-1959

Subseries 3, Multi-Image Loops, circa 1956-1958

Subseries 4, Instructional Films, circa 1939-1962

Subseries 5, Travel Films, circa 1955-1958

Subseries 6, Papers, undated

Physical Characteristics and Technical Requirements

Gloves must be worn when handling unprotected photographs and negatives. Researchers must use reference copies of audio-visual materials. When no reference copy exists, the Archives Center staff will produce reference copies on an "as needed" basis, as resources allow.

Names and Subject Terms

This collection is indexed in the online catalog of the Smithsonian Institution under the following terms:

Subjects:

- Box making
- Chronophotography
- Dental instruments and apparatus
- Dental offices
- Diesel motor industry
- Drafting table
- Food processing plants
- Government consultants -- Asia -- Japan
- Government productivity -- Japan
- Greeting cards industry
- Hospitals -- Materials management
- Industrial engineering -- 1930-2000
- Industrial films
- Industrial management
- Industrial productivity -- measurements
- Machine shops
- Machinery industry
- Materials handling
- Meat -- Packing
- Meat industry and trade
- Meat inspection
- Methods engineering
- Motion study
- Organizational effectiveness
- Pharmaceutical industry
- Plant layout
- Poultry -- Inspection
- Poultry industry
- Punched card systems -- Machinery
- Refuse collection
- Shipbuilding industry
- Shoe industry
- Slaughtering and slaughter-houses
- Steel founding
- Steel industry and trade
- United States Department of Agriculture
- Work measurement

Types of Materials:

- Charts
- Correspondence -- 1930-1950
- Diagrams
- Field notes
- Loop films
- Motion photographs
- Motion pictures (visual works)
- Photographs -- 20th century

Transparencies

Names:

A.O. Smith Company
Aji-no-moto Corporation
Albert Trostel and Sons
Aluminum Goods Manufacturing Comp
American Colortype
American Institute of Industrial Engineers
Asian Productivity organization
Barbar and Coleman
Bridgestone
Briggs and Stratton
Buffalo China Company
Cindahy Brothers Company
College of Technology Birmingham, England
Deming, Edwards
E.I. DuPont De Nemours
Gambrell, C.B.
Gardner Board and Carton Company
Hamilton Manufacturing Company
Herbst Shoe Manufacturing Company
Japan Productivity Center
Japanese Management Association
Kanaki Gear Plant
Kanebo Spinning Co.
Kawasake Dockyard
Lockheed Shipbuilding and Construction Comp
Milwaukee Dental Research Group
Milwaukee Gas Company
Mitsubishi Heavy Industries Ltd.
Nihon Denso
Nippon Electric Company
Nippon Kokan Tsurumi
Pillsbury Mills
Purdue University
S.C. Johnson and Son
Society for the Advancement of Management
Stephan A. Young Company
Sumitomo
Walgreen's
Western Printing and Lithography Corp
Westover Engineers
Yanmar Diesel Engine Company

Geographic Names:

United States Navy Long Beach Naval Shipyard
United States Rock Island Arsenal

Container Listing

Series 1: Biographical Materials, 1953-1996

Box 1, Folder 1	Bibliography and Curriculum Vitae, undated
Box 1, Folder 2	Correspondence, 1953-1968
Box 1, Folder 3	Gilbreth Medal, 1981
Box 1, Folder 4	Memberships-American Institute of Industrial Engineers, 1980
Box 1, Folder 5	Memberships-Society for the Advancement of Management, 1965-1966
Box 1, Folder 6	Miscellaneous 7 Personal, 1991-1996 8 Photographs-Mundel Head Shots, undated 9 Photographs-Miscirca, undated 36 1 Honorary Certificates, 1953-1989, undated
Box 1, Folder 7	Personal, 1991-1996
Box 1, Folder 8	Photographs-Mundel Head Shots, undated Image(s)
Box 1, Folder 9	Photographs-Miscirca, undated
Box 36, Folder 1	Honorary Certificates, 1953-1989

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Series 2: Writings, 1937-1994

Subseries 2.1: Books, 1942-1994

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|-------------------|--|
| Box 1, Folder 10 | BASIC-A Personal Computer Language for Improving Productivity, 1986 |
| Box 1, Folder 11 | Case Problems in Industrial Engineering Management, 1945 |
| Box 1, Folder 12 | A Conceptual Framework for the Management Sciences, 1967 |
| Box 2, Folder 1 | Improving Productivity and Effectiveness, 1983 |
| Box 2, Folder 2 | Measuring and Enhancing the Productivity of Service and Government Organizations, 1980 |
| Box 2, Folder 3 | Measuring the Productivity of Commercial Banks, 1987 |
| Box 2, Folder 4 | Measuring the Productivity of Commercial Banks, with disk, 1987 |
| Box 2, Folder 5 | Measuring Total Productivity of Manufacturing Organizations, with disk, 1987 |
| Box 2, Folder 6 | Methods Research, 1948 |
| Box 3, Folder 1 | Motion and Time Study, 2nd Edition, 1955 |
| Box 3, Folder 2 | Motion and Time Study, 4th Edition, 1970 |
| Box 3, Folder 3 | Motion and Time Study, 7th Edition, with disk, 1994 |
| Box 4, Folder 1 | Motion and Time Study, 7th Edition, with disk, 1994 |
| Box 4, Folder 2-3 | Motion and Time Study Workbook, 1942, 1944, 1947, 1950 |
| Box 4, Folder 4 | The Philosophy and Use of Work Measurement, undated |
| Box 4, Folder 5 | Systematic Motion and Time Study, 1947 |
| Box 5, Folder 1 | Toward the Improvement of Government, 1970 |
| Box 5, Folder 2 | The White Collar Knowledge Worker, with disk, 1989 |

Subseries 2.2: Papers, 1959-1989 and undated

- Box 5, Folder 3-4 Conferences, 1957-1989
- Box 5, Folder 5 Government, undated
- Box 5, Folder 6-7 Industrial Engineering, undated
- Box 6, Folder 1 Japan, undated
- Box 6, Folder 2 Management Organization, undated
- Box 6, Folder 3 Miscellaneous, undated
- Box 6, Folder 4 Time and Motion Study, undated
- Box 6, Folder 5-6 Work Measurement, undated

Subseries 2.3: Publications, 1937-1993 and undated

- Box 7, Folder 1 Undated, undated
- Box 7, Folder 2-4 1937-1993, 1937-1993
- Box 7, Folder 5 Foreign Publications, 1950-1960
- Box 7, Folder 6 Japanese Publications, 1960-1962
- Box 36, Folder 2 Life Magazine Article (original), 1946
- Box 7, Folder 7 Life Magazine Article (photocopy), 1946

Subseries 2.4: Speeches, undated

Box 8, Folder 1-2

Subseries 2.5: University of Iowa Studies, 1938-1940

Box 8, Folder 3

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Series 3: Industrial Engineering, 1954-1995

Box 8, Folder 4	Encyclopedia Britannica Entries, 1956-1967
Box 8, Folder 5	Deming, Edwards, 1975-1995
Box 8, Folder 6	Gambrell, C.B., 1958-1959
Box 8, Folder 7-8	Research, 1954-1982

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Series 4: Work Methods, 1983 and undated

Box 9, Folder 1	Dunn and Bradstreet Rating, 1983
Box 9, Folder 2	Equipment, undated
Box 9, Folder 3	Forms, undated
Box 9, Folder 4	Office Procedures, undated
Box 9, Folder 5-6	Visual Aids, undated

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Series 5: Purdue University, 1951-1957

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|-----------------|------------------------------------|
| Box 9, Folder 7 | Course Work, 1956-1957 and undated |
| Box 9, Folder 8 | England Seminars, 1951-1957 |
| Box 9, Folder 9 | Photographs, undated |

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Series 6: Time and Motion Study, 1952-1984

Subseries 6.1: Consulting Work, 1954-1966

Box 10, Folder 1	Aluminum Goods Manufacturing Company, 1955
Box 10, Folder 2	American Colortype: Greeting Card Division, 1956
Box 10, Folder 3	A.O. Smith Corporation, 1954
Box 10, Folder 4	Barber and Colman, 1956
Box 10, Folder 5	Briggs and Stratton, 1957
Box 10, Folder 6	Buffalo China Company, 1958-1961
Box 10, Folder 7-9	Cudahy Brothers Company, 1954-1957
Box 10, Folder 10	Gardner Board and Carton Company, 1956-1957
Box 11, Folder 1-2	Hamilton Manufacturing Company, 1957-1958
Box 11, Folder 3	Herbst Shoe Manufacturing Company, undated
Box 11, Folder 4	Hudson Pulp and Paper Company, 1966
Box 11, Folder 5	S.C. Johnson and Son, 1956
Box 11, Folder 6	Lockheed Shipbuilding and Construction Company, 1963
Box 11, Folder 7	Milwaukee Gas Company, 1954
Box 11, Folder 8	Mirro Rating History, 1955-1956
Box 11, Folder 9	Pillsbury Mills, 1955-1957
Box 11, Folder 10-11	Albert Trostel and Sons, 1955
Box 11, Folder 12	Western Printing and Lithography Company, 1957-1958
Box 11, Folder 13	Westover Engineers, 1954
Box 11, Folder 14	Stephen A. Young Corporation, 1959

Subseries 6.2: Correspondence, 1956-1960

Box 12, Folder 1

Subseries 6.3: Course Work, undated

Box 12, Folder 2

Subseries 6.4: Equipment, undated

Box 12, Folder 3

Subseries 6.5: Film, 1952-1984

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|------------------|---|
| Box 12, Folder 4 | Byron Motion Pictures, 1976-1984 |
| Box 12, Folder 5 | Camera Random Timer, undated |
| Box 12, Folder 6 | Correspondence, 1960-1980 |
| Box 12, Folder 7 | Equipment, undated |
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| Box 13, Folder 1 | Memomotion, 1956-1958 |
| Box 13, Folder 2 | Multi-image Loops, 1954-1958 |
| Box 13, Folder 3 | Notes, undated |
| Box 13, Folder 4 | Rating Data, 1955-1958 |
| Box 13, Folder 5 | Research, 1952-1958 |
| Box 13, Folder 6 | Toggle Relay Switch and Motors, undated |
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Subseries 6.6: Memberships - Industrial Management Society, 1970-1977

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Subseries 6.7: Research, 1957

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Series 7: Government Work, 1952-1971

Subseries 7.1: General, 1955-1967 and undated

- Box 14, Folder 1 Application and Pay Information, 1955-1964
- Box 14, Folder 2 Correspondence and Job Descriptions, 1963-1965
- Box 14, Folder 3 Course Work, 1967
- Box 14, Folder 4 Monthly Reports, 1963-1964
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Subseries 7.2: Rock Island Arsenal, 1952-1958

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- Box 37, Folder 1-4 Photographs, 1952-1958

Subseries 7.3: Consulting, 1959-1971

- Box 15, Folder 1 Army Value Analysis Program, 1959
- Box 15, Folder 2 Work Management, 1959
- Box 15, Folder 3 Work Management - Photographs, 1959
- Box 15, Folder 4 Naval Shipyard, 1960
- Box 15, Folder 5 Bureau of the Budget, 1963
- Box 15, Folder 6-7 Long Beach Naval Shipyard, 1963
- Box 15, Folder 8 Work Measurement Program, 1964
- Box 15, Folder 9 Secret Service, 1964
- Box 15, Folder 10 United States Dept. of Agriculture - Animal Health, 1969

Box 15, Folder 11 Cotton Marketing Assistance, 1971

Box 15, Folder 12 Dairy Inspection, 1971

Box 16, Folder 1 Fruit and Vegetable Division, undated

Box 16, Folder 2 Livestock Division, undated

Box 16, Folder 3-6 Meat Inspection, 1965-1971

Box 16, Folder 7 Milk Marketing, undated

Box 16, Folder 8 Tobacco Marketing Assistance, undated

Box 16, Folder 9 Report Contract Bureau of Alcohol, Tobacco, and Firearms, undated

Subseries 7.4: Seminars, 1963-1969

Box 17, Folder 1 Supervisor Development Program, 1963

Box 17, Folder 2 Systems and Procedures Association, 1964

Box 17, Folder 3 Management Analysis, 1964 June

Box 17, Folder 4 Kansei Productivity Seminar, 1964 July

Box 17, Folder 5 Work Measurement Seminar, 1964 September

Box 17, Folder 6 Interagency Records Administration Conference, 1964 September

Box 17, Folder 7 National Aeronautics and Space Administration (NASA) Headquarters Speech, 1964 October

Box 17, Folder 8 Bureau of Inspections, 1964 November

Box 17, Folder 9 United States Dept. of Agriculture Work Unit Analysis Course, 1966

Box 17, Folder 10 Systems and Procedures Association, 1967

Box 17, Folder 11 Department of Transportation, 1968

Box 17, Folder 12 National Aeronautics and Space Administration (NASA), 1968

- Box 17, Folder 13 Performance Rating Workshop, 1969
- Box 17, Folder 14 Ritter Dental Conference, 1969
- Box 17, Folder 15 Navy Fleet Work Study School, 1969

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Series 8: Japanese Consulting, 1959-1987

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Box 18, Folder 2	Bridgestone, 1972
Box 18, Folder 3-4	Iron and Steel Federation, 1965-1980
Box 18, Folder 5	Kanebo Spinning Company, 1962
Box 18, Folder 6	Kanzaki Gear Plant, undated
Box 18, Folder 7	Kawasake Dockyard, 1965-1970
Box 18, Folder 8-9	Mitsubishi-Heavy Industries Ltd., 1965-1980
Box 19, Folder 1	Mitsubishi-Heavy Industries Ltd.-Brochures, 1965-1980
Box 19, Folder 2	Mitsubishi-Heavy Industries Ltd.-Hiroshima, 1965-1980
Box 19, Folder 3	Mitsubishi-Heavy Industries Ltd.-Lockheed Shipyard, 1965-1980
Box 19, Folder 4	Mitsubishi-Heavy Industries Ltd.-Takasago, 1965-1980
Box 19, Folder 5	Mitsubishi-Heavy Industries Ltd.-Takasago-Notebook, 1965-1980
Box 19, Folder 6	Mitsubishi-Heavy Industries Ltd.-Yokohama, 1965-1980
Box 20, Folder 1	Nihon Denso, undated
Box 20, Folder 2-5	Nippon Kokan Tsurumi, 1962
Box 21, Folder 1	Nippon Kokan Kk (NKK), 1966-1975
Box 21, Folder 2-3	Nippon Electric Company, 1966-1975
Box 21, Folder 4	Sumitomo, 1966-1967
Box 21, Folder 5-6	Yanmar Diesel Engine Company, 1961-1979
Box 22, Folder 1-3	Notebooks, 1966-1967 and undated

Box 22, Folder 4-9 Trips, 1965-1968

Subseries 8.2: Correspondence, 1959-1980

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Subseries 8.3: Keio University, 1960-1961

Box 22, Folder 11 Course Work-English, 1960

Box 22, Folder 12 Course Work-Japanese, undated

Box 22, Folder 13 Dr. Mundel Seminar, 1961

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Box 22, Folder 15 Time and Motion Seminar, undated

Box 23, Folder 1 Course Work, 1959

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Box 24, Folder 2 Japanese Management Association, 1964-1979

Box 24, Folder 3 Japanese Management Association-Bulletin 1-8, 1964-1979

Box 24, Folder 4 Japanese Management Association-Films, 1964-1979

Box 24, Folder 5 Japanese Management Association-Miscellaneous, 1964-1979

Box 24, Folder 6 Japanese Management Association-Newsletter, 1978-1987

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- Box 33, Item OF 676.1 OF 676.1 Original of Titles and Some Scenes from Plate Crystal, circa 1965
Demonstration Rating Film. 16mm black and white silent camera original reversal, 417 feet. Original titles used with other rating films combined into one film by Mundel. Also included some scenes from the plate radio crystal rating film.
- Box 34, Folder OF 676.2 OF 676.2 Roping Salami, circa 1954
Demonstration Rating Film. 16mm black and white silent print, 330 feet. Following a title sequence, ten scenes of a woman roping salami with string. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.3 OF 676.3 Feed 28 Tank Heads to Punch Press, circa 1954
OF 676.3 RF 676.3 RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 330 feet Following a title sequence, ten scenes of a man working with a large machine. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.4 OF 676.4 Assemble Screws to Insulators, circa 1954
RV 676.70 Demonstration Rating Film. 16mm black and white silent print, 375 feet. Following a title sequence, ten scenes of a man putting parts together. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.5 OF 676.5 Set Up Wire Bound Box OF 676.5 Set Up Wire Bound Box, circa 1956
RF 676.5 RV 676.69 Demonstration Rating Film. 16mm black and white silent print, 367 feet Following a title sequence, ten scenes of a man putting together a wire bound wooden box. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.6 OF 676.6 Lift Teletype from Mounting Bolts, circa 1965
RV 676.69 Demonstration Rating Film. 16mm black and white silent print, 360 feet. Following a title sequence, ten scenes of a man lifting a machine and setting it down. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.7 OF 676.7 Manual Purge of File, circa 1965
RV 676.71 Demonstration Rating Film. 16mm black and white silent print, 390 feet Following a title sequence, ten scenes of a woman going through files and sorting cards. Each scene is a different pace.
- Box 34, Folder OF 676.7 OF 676.8 Loosen Terminal Block Support, circa 1965
RV 676.74 Demonstration Rating Film. 16mm black and white silent print, 374 feet. Following a title sequence, ten scenes of a man with a hand inside of a box. He loosens a bolt with a screwdriver. Each scene is a different pace.

- Box 34, Folder OF 676.9
OF 676.9 Plate and Check Radio Crystal and Frequency, circa 1965
RV 676.70 Demonstration Rating Film. 16mm black and white silent print, 374 feet Following a title sequence, ten scenes of a woman working with a large radio machine. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.10
OF 676.10 Load Piece onto Tool of Broach, circa 1956
RV 676.71 Demonstration Rating Film. 16mm black and white silent print, 374 feet. Following a title sequence, ten scenes of a man working with a large machine. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.11
OF 676.11 Wrap 1/4 Aluminum Measuring Cup, circa 1956
RF 676.11 Demonstration Rating Film. 16mm black and white silent print, 376 feet. Following a title sequence, ten scenes of a woman wrapping measuring cups. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.12
OF 676.12 Apply Pressure Sensitive Label, circa 1957
RV 676.69 Demonstration Rating Film. 16mm black and white silent print, 350 feet. Following a title sequence, ten scenes of a man with papers and labels. Each scene is a different pace.
- Box 34, Folder OF 676.13
OF 676.13 Make Mold, Assemble Flask, circa 1957
RV 676.69 Demonstration Rating Film. 16mm black and white silent print, 400 feet Following a title sequence, ten scenes of men working at benches with large machines. Each scene is a different pace.
- Box 34, Folder OF 676.14
OF 676.14 Load 10 lb. Boxes on Skid, circa 1957
RV 676.69 Demonstration Rating Film. 16mm black and white silent print, 354 feet. Following a title sequence, ten scenes of a man loading crates onto a dolly. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.15
OF 676.15 Hand Feed Box to Wrapping Machine, circa 1958
RV 676.75 Demonstration Rating Film. 16mm black and white silent print, 335 feet. Following a title sequence, ten scenes of a woman working with a machine and boxes. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.16
OF 676.16 Interleave Greeting Cards and Envelopes, circa 1958
RV 676.76 Demonstration Rating Film. 16mm black and white silent print, 330 feet. Following a title sequence, ten scenes of a woman putting together cards and envelopes. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.17
OF 676.17 Run NATCO Multi-Spindle Drill, circa 1959
RF 676.17 RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 352 feet. Following a title sequence, ten scenes of a man working with a large machine. The work in each scene is performed at a different pace.
- Box 34, Folder OF 676.18
OF 676.18 Feed Casing In Machine (Bookbinding), circa 1959

- RV 676.77 Demonstration Rating Film. 16mm black and white silent print, 332 feet. Following a title sequence, ten scenes of a woman working with a machine. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.19 OF 676.19 Assemble Brush Diaphragm, circa 1959
RV 676.78 Demonstration Rating Film. 16mm black and white silent print, 338 feet Following a title sequence, ten scenes of a woman brushing off a part before assembly. Each scene is a different pace.
- Box 34, Folder OF
676.20 OF 676.20 Place Cover on Doll Boxes, circa 1959
RV 676.79 Demonstration Rating Film. 16mm black and white silent print, 345 feet. Following a title sequence, ten scenes of a woman putting covers on doll boxes. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.21 OF 676.21 Trim Meat from Blade Bone, circa 1959
RV 676.80 Demonstration Rating Film. 16mm black and white silent print, 331 feet. Following a title sequence, ten scenes of a man cutting pieces of meat from the bone. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.22 OF 676.22 Measure Hog Casings, circa 1957
RF 676.22 RV 676.81 Demonstration Rating Film. 16mm black and white silent print, 340 feet. Following a title sequence, ten scenes of a woman measuring hog casings. The work in each scene is performed at a different pace.
- Box 34 OF 676.23 Pulling Electrical Cable Aboard Ship, circa 1960
RF 676.23 RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 352 feet. Following a title sequence, ten scenes of a man pulling cable through a hole in the ceiling. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.24 OF 676.24 Roll Edge on Sheet Metal Disc, circa 1960
RF 676.24 RV 676.70 Demonstration Rating Film. 16mm black and white silent print, 342 feet. Following a title sequence, ten scenes of a man working with a drill. Each scene is a different pace.
- Box 34, Folder OF
676.25 OF 676.25 Assemble Deck House to Coaming with Huck Bolts, circa 1960
RV 676.70 Demonstration Rating Film. 16mm black and white silent print, 330 feet. Following a title sequence, ten scenes of a man putting bolts into the wall. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.26 OF 676.26 Scribe Diameter on Sheet Metal Disc, circa 1960
RV 676.70 Demonstration Rating Film. 16mm black and white silent print, 345 feet. Following a title sequence, ten scenes of a man scoring diameter of large discs on table. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.27 OF 676.27 Push Hand Cart, circa 1963
RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 296 feet. Following a title sequence in English and Japanese, ten scenes of a man

- pushing cart across factory floor. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.28
- OF 676.28 Spot Face and Drill, circa 1962
RV 676.71 Demonstration Rating Film. 16mm black and white silent print, 380 feet. Following a title sequence in English and Japanese, ten scenes of a man working with a drill. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.29
- OF 676.29 Assorted Pharmaceutical Operations, circa 1959-1960
RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 380 feet. Following a title sequence, ten scenes of men and women doing different operations in a pharmaceutical plant. Examples include: men loading vats of pills into machines, women putting labels on bottles, and boxing bottles. Mundel's notes on head of film identify company as Parke Davis.
- Box 34, Folder OF
676.30
- OF 676.30 Assorted Machine Operations, circa 1961
RF 676.30 RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 383 feet. Following a title sequence in English and Japanese, ten scenes of men and women doing different jobs with large machines.
- Box 34, Folder OF
676.31
- OF 676.31 Lift Boxes of Various Weights, circa 1959
RF 676.31 RV 676.68 Demonstration Rating Film. 16mm black and white silent print, 355 feet. Following a title sequence, ten scenes of a man lifting boxes and putting them on a conveyor belt. The work in each scene is performed at a different pace.
- Box 34, Folder OF
676.32
- OF 676.32 Sampling Rating #1, circa 1965
RF 676.32 RV 676.71 Demonstration Rating Film. 16mm black and white silent camera original reversal, 395 feet. Following a title sequence, fifty scenes of men and women working at different jobs. Scenes taken from other rating films.
- Box 34, Folder OF
676.33
- OF 676.33 Sampling Rating #2, circa 1965
RF 676.33 RV 676.71 Demonstration Rating Film. 16mm black and white silent camera original reversal, 361 feet. Following a title sequence, fifty scenes of men and women working at different jobs. Scenes taken from other rating films.
- Box 34, Folder OV
676.34
- OV 676.34 Time Study Rating Tapes Sampler , undated
Demonstration Rating Film. 1/2" VHS videocassette tape, 12 minutes. No Audio. This is a video compilation that Mundel made of scenes from the rating films in addition to a multi- image loop of a man moving boxes. Mundel projected the films and videotaped the projections.
- Box 34, Folder OF
676.35
- OF 676.35 USDA - Consumer Protection Programs - Poultry Rating Films 4-1 to 4-10, circa 1969
Poultry Rating Films. 16mm black and white silent print, 342 feet. Following a title sequence, ten scenes of men working with poultry on an assembly line.

- Box 34, Folder OF 676.36 OF 676.36 USDA - Consumer Protection Programs - Poultry Rating Films 5-1 to 5-10, circa 1969
Poultry Rating Films. 16mm black and white silent print, 343 feet. Following a title sequence, ten scenes of men working with poultry on an assembly line.
- Box 34, Folder OF 676.37 OF 676.37 USDA - Consumer Protection Programs - Poultry Rating Films 6-1 to 6-10, circa 1969
Poultry Rating Films. 16mm black and white silent print, 340 feet. Following a title sequence, ten scenes of men working with poultry on an assembly line.
- Box 34, Item OF 676.38 OF 676.38 USDA - Consumer Protection Programs - Poultry Rating Films 7-1 to 7-10, circa 1969
Poultry Rating Films. 16mm black and white silent print, 348 feet. Following a title sequence, ten scenes of men working with poultry on an assembly line.
- Box 34, Item OF 676.39 OF 676.39 USDA - Consumer Protection Programs - Poultry Rating Films 8-1 to 8-10, circa 1969
Poultry Rating Films. 16mm black and white silent print, 340 feet. Following a title sequence, ten scenes of men working with poultry on an assembly line.
- Box 34, Item OF 676.40 OF 676.40 USDA - Consumer Protection Programs - Poultry Rating Films 9-1 to 9-7, circa 1969
Poultry Rating Films. 16mm black and white silent print, 265 feet. Following a title sequence, seven scenes of men working with poultry on an assembly line.
- Box 34, Folder OF 676.41 OF 676.41 USDA - Consumer Protection Programs - Poultry Rating Films 10-1 to 10-10, circa 1969
Poultry Rating Films. 16mm black and white silent print, 338 feet. Following a title sequence, ten scenes of men working with poultry on an assembly line.
- Box 34, Folder OF 676.42 OF 676.42 USDA - Consumer Protection Programs - Poultry Rating Films 11-1 to 11-6, circa 1969
Poultry Rating Films. 16mm black and white silent print, 200 feet. Following a title sequence, six scenes of men working with poultry on an assembly line.
- Box 34, Folder OF 676.43 OF 676.43 USDA - Consumer Protection Programs - Poultry Rating Films 12-1 to 12-8, circa 1969
Poultry Rating Films. 16mm black and white silent print, 268 feet. Following a title sequence, eight scenes of men working with poultry on an assembly line.
- Box 34, Folder OF 676.44 OF 676.44 Poultry Rating Films - Scenes 1-10, circa 1973
Poultry Rating Films. 16mm black and white silent print, 387 feet. Ten scenes of men working with poultry on an assembly line. Each scene is from a different viewpoint.
- Box 34, Folder OF 676.45 OF 676.45 Poultry Rating Films - Scenes 11-20, circa 1973

Poultry Rating Films. 16mm black and white silent print, 380 feet. Ten scenes of men working with poultry on an assembly line. Each scene is from a different viewpoint.

Box 34, Folder OF
676.46

OF 676.46 Poultry Rating Films - Scenes 21-30, circa 1973

Poultry Rating Films. 16mm black and white silent print, 381 feet. Ten scenes of men working with poultry on an assembly line. Each scene is from a different viewpoint.

Box 34, Folder OF
676.47

OF 676.47 Tung-Sol Threading Film 1, circa 1939

16mm black and white silent print, 19 feet. Close up shots of hands holding various Tung-Sol parts. Man working with wires. Stopwatch visible in scenes.

Box 34, Folder OF
676.48

OF 676.48 Tung-Sol Threading Film 2, circa 1939

16mm black and white silent print, 19 feet Man working with his hands with stopwatch in view.

Box 34, Folder OF
676.49

OF 676.49 Packing Toy Motor Cars, circa 1939

16mm black and white silent print, 355 feet. By the Annie Shaw Organization of Cheadle Cheshire, England. Following a title sequence, scenes of children playing with remote control car. Motion study of workers boxing the car before analysis and improved scenes after analysis. This film may need to be viewed at 960 frames per minute.

Box 34, Folder OF
676.50

OF 676.50 ASF Films, circa 1946

16mm black and white silent print and color silent camera original reversal, 246 feet. Composite reel joined by the Archives Center. Scenes of men working at a table. Original methods of work on Gould machines as well as improved methods. Rating film of workers.

Box 34, Folder OF
676.51

OF 676.51 Woods Veterans Hospital Films, circa 1959

16mm black and white silent camera original reversal, 71 feet. Composite reel joined by the Archives Center. Scenes of women nurses assembling surgical dressings. Second film was a loop, the Archives Center disassembled it for viewing purposes. Scenes of women putting together gauze packs.

Box 35, Folder OV
676.52

OV 676.52 Montfort Time Study, circa 1980s

1/2 VHS videocassette tape, 1 hr. - No Audio. Perhaps Mundel's later work at the Montfort slaughterhouse. Documents each work unit involved in process of slaughter. Counter at bottom of screen

Subseries 11.2: Memomotion Films, circa 1948-1959

Box 35, Folder OF
676.53

OF 676.53 Memomotion Extra Examples, circa 1948

16mm black and white silent camera original reversal, 184 feet. Memomotion filming of different work settings. Men working with machines followed by Sherman laundry service and maid service.

- Box 34, Folder OF
676.54
- OF 676.54 Memomotion Examples, circa 1954
RF 676.54 RV 676.72 16mm black and white silent print, 424 feet.
Memomotion filming of different work settings. Men drilling in street, train tracks, men in factory making a frame, men in factory making wood structures, men in wood or paper factory, TWA airplanes loading, unloading, and taxiing, [Peacock?] wood factory, men putting boxes on a conveyor belt, and men working in a foundry.
- Box 34, Folder OF
676.55
- OF 676.55 [Memomotion Examples Compilation], circa 1954
16mm black and white silent print, 230 feet. Composite reel joined by the Archives Center. Memomotion filming of different work settings. Comparison of memomotion of man cutting meat and pace filming of man cutting meat. Next film, memomotion filming of an airplane taxiing and an operation room (gall bladder surgery).
- Box 34, Folder OF
676.56
- OF 676.56 Memomotion of Garbage Trucks, circa 1956
16mm black and white silent print, 277 feet. Memomotion filming of garbage trucks loading and unloading. Poor quality throughout.
- Box 34, Item OF
676.57
- OF 676.57 Dental Film, circa 1959
RV 676.72 16mm black and white silent print, 527 feet. Composite reel joined by Archives Center. Film made in association with the Milwaukee Dental Research Group. Following a title sequence, memomotion filming of a dentist, hygienist, and patient. Scenes of original method and improved method. Film continues by showing how further analysis of motion studies can improve work of dentist and patient comfort.
- Box 34, Folder OF
676.58
- OF 676.58 Dental Film (1979 version), circa 1959
16mm black and white silent print, 370 feet. This is a 1979 edit of the original 1959 film.

Subseries 11.3: Multi-Image Loops, circa 1956-1958

- Box 34, Folder OF
676.59
- OF 676.59 Multi-Image Loops, circa 1956-1958
16mm black and white silent print, 132 feet. Composite reel joined by the Archives Center. These were unspliced loops that were put together on one reel for viewing purposes. Each loop has twelve images of rating scenes, each working at a different pace (fastest in the top left-hand corner and the slowest in the bottom right-hand corner). Loops show paces of measuring hog casings, wrapping measuring cups, interleaving greeting cards and envelopes, small electric motors, brush diaphragm assembly, and hammering. Most of the jobs correspond to the rating films.
- Box 34, Folder OF
676.60
- OF 676.60 Brush Diaphragm Assembly Multi-Image Loop, circa 1958
16mm black and white silent print, 8 feet. Loop of a woman brushing a part before assembly was left as Mundel stored his loops.
- Box 35, Folder OV
676.61
- OV 676.61 Multi-Image Loop - Move Boxes, undated

1/2" VHS videocassette tape, 31 minutes. No Audio. This is a video recording of a projection of a multi-image loop. Twelve scenes of men moving boxes on a conveyor belt at different paces.

Subseries 11.4: Instructional Films, circa 1939-1962

- Box 34, Folder OF
676.62
- OF 676.62 More Production through Motion Studies, circa 1939
RV 676.72 16mm black and white silent print, 358 feet. Mundel made this film while teaching at Purdue University. It tells the story of motion study and how it is beneficial to productivity. The film depicts various activities that were improved after time and motion study analysis. Also included are stop action scenes of drawings and work flow diagrams.
- Box 34, Folder OF
676.63
- OF 676.63 Making Microscope Slides, circa 1955
16mm black and white silent print, 207 feet. Film made by the Department of Industrial Administration, College of Technology, Birmingham, England. Following a title sequence, original methods of making microscope slides are contrasted with the improved methods after time and motion study analysis.
- Box 34, Folder OF
676.64
- OF 676.64 Uses of Motion Pictures, circa 1955
16mm black and white silent and color silent camera original reversal, 215 feet. Following a title sequence, film portrays different time and motion study filming techniques including memomotion, multi-image and rating films to improve job performance. Jobs are: women peeling tomatoes, core blower operation, Walgreen's drug store, foundry work, towel tracking in a laundry, sewing machine operations, and piston ring molding. This film may have been made in conjunction with Purdue University.
- Box 35, Folder OV
676.65
- OV 676.65 How to Make Memomotion, circa 1962
1/2 VHS videocassette tape, 28 minutes - No Audio. This is a video recording of the projection of a black and white film. This is Mundel's instructional film for Japanese industrial engineers. The titles and writing are in Japanese. Film includes images of Mundel, stop action filming, scenes from Japanese factories and plants. It captures how to implement a time and motion project in a factory by showing the set-up of the camera and the analyst using the projector. There are a few memomotion examples from Japanese plants as well as footage from the Dental Film.

Subseries 11.5: Travel Films, circa 1955-1958

- Box 35, Folder OF
676.66
- OF 676.66 Bullfighting [Trip to Mexico], circa 1955
16mm color silent camera original reversal, 445 feet. This film shows Mundel's interest in other cultures. He filmed many billboards and signs in addition to children playing and people walking in the streets. He filmed a bullfight that he attended in Mexico.
- Box 35, Folder OF
676.67
- OF 676.67 Kawaguchiko Fuji [Trip to Japan], circa 1958
16mm color silent and black and white silent camera original reversal, 316 feet. Mundel took these images of Japan during an Industrial Engineering seminar that he attended. Much of the film is scenes of the Japanese

landscape and the people. A short black and white section is of the seminar that he attended.

Subseries 11.6: Papers, undated

Box 35, Folder 1-2

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