

Guide to the Technology and Society Collection

RU 472



compiled by Daniel Hartwig

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Collection Overview

REPOSITORY: Manuscripts and Archives
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CALL NUMBER: RU 472

TITLE: Technology and Society Collection

DATES: Circa 1946-1962

PHYSICAL DESCRIPTION: 49.25 linear feet (108 boxes)

LANGUAGE: English

SUMMARY: The collection consists of correspondence, research data, interviews, statistics, reports, and printed material compiled to document studies made in twelve American companies by the Yale Technology Project and related material.

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Key to the container abbreviations used in the PDF finding aid:

b. box
f. folder

Administrative Information

Conditions Governing Access

The materials are open for research.

Conditions Governing Use

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Preferred Citation

Technology and Society Collection (RU 472). Manuscripts and Archives, Yale University Library.

Processing Information

Yale University records are arranged and described at the accession level by the creating office. The University Archives creates collection level descriptive records, but typically does no further arrangement and description at the accession level.

Scope and Contents

The collection consists of correspondence, research data, interviews, statistics, reports, and printed material compiled to document studies made in twelve American companies by the Yale Technology Project and related material. Included are profiles of communities in economic crisis, analyses of technology and industrial organizations, and statistical data on worker attitudes and industrial relations problems. There are approximately 2000 interviews with workers, covering the subjects' lives, history, work experiences, values, and emotions. The research led to the publication of well-known works such as "Man on the Assembly Line," and "Toward the Automatic Factory". Many of the studies were never formally published.

The twelve studies varied widely in duration, size, research topics and methodology. Many of the studies were consulting programs (conducted by Charles R. Walker Associates) as well as research projects (conducted by the Yale Technology Project). In the consulting programs, such as the one at Avco, the consultants became involved with the management process, sometimes even acting as managers, but there is no substantial difference in the kinds of material contained in the files of these different kinds of studies. All of the studies were directed by Charles R. Walker, the Director of the Yale Technology Project. Frederick Richardson was the co-researcher for the IBM and Ford studies. Robert H. Guest, Arthur Turner and Frank J. Jasinski joined Walker later and formed a research and consulting team.

All of the studies have been arranged in a similar manner. An introduction and an outline for each study are included in the Guide to the Collection. File 1 of each study contains copies of the introduction and outline and tables of contents for the files of particular importance or complexity. The tables of contents briefly describe all the items in the files covered. Copies of the tables are also placed in the appropriate files. Every item in every file has been labeled with its file number,

The material has been filed in the following general order:

- Background (guide, correspondence, methodology, preliminary notes)
- Data (interviews, observations, statistics and diagrams)
- Reports (notes, drafts and final reports)
- Duplicate Material

Each file has two labels indicating its general category and specific contents.

The Guide to the Collection provides an overview of all the studies, indicating the nature of each study and the general contents of the files. After a particular study has been selected, the introductory materials and the tables of contents in file 1 should be reviewed. Often the best introduction to the purposes, data and conclusions of a study is found in a comprehensive final report. Organizational charts are usually

important and should be studied. Unless this preparatory material is understood, the raw data - interviews, observations, statistics or diagrams - is likely to be baffling and might well be misinterpreted.

In all of the published books and articles derived from the studies, the names or other identifying characteristics (such as exact location) of the companies were never revealed. Confidentiality was usually promised at the beginning of research, and that promise is presumably still in effect.

The library accompanying the files contains books on economic and social affairs donated by Mr. Walker and many books specifically purchased for the Collection. Of special importance are the books derived from the Yale Technology Project studies. These books have been placed in a separate group.

General note

Forms part of Yale Record Group 33-D (YRG 33-D), Records of the Yale Technology and Society Collection.

Arrangement

The records are arranged as follows: I. General Guide. II. Yale Technology and Society Project Pamphlets. III. General Motors Study. IV. Raytheon Study. V. Ford Study. VI. Kodak Study. VII. Dresser Study. VIII. U.S. Steel Study. IX. IBM Study. X. General Electric Study. XI. Merck Study. XII. Jones and Laughlin Steel Study. XIII. New York Trust Study. XIV. AVCO Study. XV. Research Files. XVI. Research Pamphlets. XVII. Research Periodicals and Government Publications.

Collection Contents

Accession 1985-A-066: Yale Technology Project records

Series I: General guide

General Files

b. 2b. 1, f. 1-23	Yale Technology Project Files
b. 3b. 2, f. 24-44	Personal Papers and Correspondence of YTP Staff
b. 3, f. 45-54	Consulting Papers
b. 4b. 3, f. 55-62	Speeches
b. 5b. 4, f. 63-103	Books, Articles and Essays by YTP Staff
b. 5, f. 104-121	Professional Papers
b. 6, f. 122-124	Bibliography
b. 6, f. 125-128	Clippings

Series II: Yale Technology and Society Project pamphlets

b. 7, f. 1-32	Pamphlets
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Series III: General Motors Study

The study of General Motors spanned ten years and included five distinct though overlapping studies at two plants (Framingham, Massachusetts and Linden New Jersey) and one at a ballbearing plant in Connecticut (New Departure in Meriden). Both Framingham hourly workers and Linden hourly workers were studied intensively. Framingham foremen were interviewed and observed in minute detail, while Linden foremen were studied as part of the Workers study and Crisis study. At GM Detroit's request, the researchers conducted a survey of Linden in crisis (1953) and then three years later a follow-up study of Linden's great improvement under a new Plant Manager. A small investigation of the New Departure Plant at Meriden was made as part of an inquiry into "Technology and Organization" in conjunction with the survey of a General Electric facility. The New Departure investigation is separate from the auto assembly line studies at Framingham and Linden.

Framingham workers

In June, 1949, the Yale researchers began study of a new plant with a youthful workforce in Framingham, Mass. These men were fairly well-educated, 3 out of 4 were married and about the same number were WWII Veterans. One-hundred and eighty workers were interviewed extensively in their homes.

Factual data was taken from personnel records, from the questioning of the workers regarding his work group, interaction, type of jobs worked on at Framingham, union meetings attended and from his description of jobs held prior to his Framingham job (the workers had undergone a significant change in work experience from the old job to the new one). Questions were asked to draw out the worker's attitudes and opinions. These questions were often open-ended because they may have evoked a strong emotional response. A two-column scale rating the Likes and Dislikes of the workers was developed. Also, a sketch of the "geography" of the man's job: work flow, spatial relationship in the work

environment and social interaction pattern. The interview was designed to bring out the attitudes and opinions the worker had about his job, his relationship to management and other workers, the working conditions, pay and promotions and his relation to the union.

Results: the majority of the workers disliked the mechanical pacing and repetitive character of their jobs. Interest in work varied directly with the number of operations performed (most workers performed only one or two operations every minute). Inability to "get quality" irritated a large number of workers. Pay and security were the most important "likes" with the immediate job as the number one "dislike."

There was little possible social interaction. Noise, pace and the character of the work frustrated the men. The nature of the assembly line process precluded functional interdependence. The few who did sub-assembly work in a group were favorably aware of their "team." The few who could move into different operations within their section recognized the variety and mobility as favorable characteristics.

Pay was a major incentive for taking a job at Framingham. Steady and secure employment motivated many men to stay.

There was a "healthy" two-way interaction between the foreman and the worker, but little interaction between the worker and higher levels of supervision. The workers generally had a high opinion of their foremen, but did not consider it to be of prime importance in deciding whether or not they liked their jobs.

There was little job mobility. Workers generally desired to be transferred to non straight production jobs as the following: foreman, utilityman, repairman, maintenance, inspection or clerical worker, etc.

A correlation was found to exist between absenteeism and turnover and mass production characteristics.

Two-thirds of the sample were favorable to the Union. Half of the workers felt that the company did not do much of anything for the men.

Linden workers

One major question was left unanswered by the Framingham - study: how well could workers adjust in time to assembly line work?

Linden was chosen as a research site to help answer this question. It was an old integrated plant and the interviews were confined to workers with at least 12 years of seniority.

Two-hundred and two workers were interviewed in their homes. The interviews, though more detailed and non-directive than the Framingham interviews, covered the same material. In general the Linden workers study confirmed the findings of the Framingham investigation. The workers were not better adjusted and actually disliked their jobs more intensely than the Framingham workers. Additionally, several non-production men and 18 workers who had quit were interviewed, only to underline the sources of dissatisfaction in the mass-production work.

The Linden Crisis Study

The Framingham and Linden studies raised the question of the importance of supervision. This question was underlined by the crisis situation at Linden. GM Detroit Management requested a study be done of all levels of production management. The researchers found a good deal of pressure for high production, but also found some individuals who were able to handle it. There were, it seemed, certain qualities needed by a foreman during times of crisis. Overtime had an

expensive and negative effect on supervisory morale which nullified sporadic production increases.

The Framingham Foremen Study

The foreman, it appeared, was in a particularly important position in terms of communicating management's policies to the worker. Fifty-five of the foremen at Framingham were interviewed. They were found to act as "buffers" between management and the worker: to counteract pressure and impersonality caused by the assembly line.

During the summer of 1954 all 55 foremen were observed for an eight-hour day. The observer spent 3 hours in the department the day before in order to familiarize himself with the foreman's job. Each observation was 40 to 70 pages in typed length. There were 32,652 incidents in total for all of the foremen. The researchers found that the pattern of a foreman's time distribution was both a reflection of his ability, training or experience, and the result of conditions beyond his control. Even the best foremen when faced with the problems of absenteeism, mechanical difficulties, changes in schedule or material shortages, had to devote an inordinate amount of time to these problems instead of performing his primary and supervisory duties.

The Linden Follow-Up Study, 1956-1957

Since 1953 a new plant manager had succeeded in greatly improving performance records (and human relations) at Linden. This study documents changes that were made and the reactions of all levels of organization. Top and middle management, supervisors and foremen, workers and others were interviewed.

New Departure, 1956-1957

A ball-bearing factory (at Meriden, Connecticut) in GM's New Departure Division was experiencing difficulties in introducing a new manufacturing system - a problem in technological change. After deciding that the organization (or social system) of the factory was an important factor in the problem, the plant management promoted changes in the old rigid vertical hierarchy. A task-oriented system was developed which brought together all those involved in the technological change, thus forming horizontal and diagonal working relationships that crossed the old hierarchical boundaries. A major element of the new system was a series of planning meetings attended by all levels of management and some hourly workers. The research study included interviews with management officials and an intensive analysis of the technology.

General material on the studies is contained in the final reports, in the background files in each study, and in the correspondence and conferences with GM management concerning the research projects. The final reports for each study usually include a statement of the purpose and methods of the study as well as the presentation of the information gathered and the conclusions and recommendations of the researchers.

Each distinct study has been arranged and filed separately, with two exceptions. A considerable amount of material concerns all of the studies in general, and this has been collected under General GM (I.). In addition, reports that were derived from both the Linden and the Framingham studies (rather than from one alone) are in a separate section (V.).

The files for each study follow a general pattern: background, company documents, data (mainly interviews and observations), notes and analysis, drafts and final reports. The drafts are not likely to provide any significant data beyond what is in the final reports. While the GM company documents (I., C., 017-043) contain much that is of little importance, they also include some material that is quite valuable.

Files that are complex or particularly important have tables of contents, with one copy placed in the file and one copy accompanying this guide. Every item in every file is numbered f ____ i _____. If any item is lost, a copy may be available in the duplicate files. Copies of the books written about GM are not placed within the files themselves but are kept with the Technology and Society Collection.

General Motors study

b. 8, f. 1-5	Background
b. 8, f. 6-16	Discussions and Correspondence with GM
b. 9b. 10b. 11b. 8, f. 17-43	Company Documents
Framingham, MA Workers	
b. 11, f. 44-50	Background
b. 11, f. 51-54	Preliminary Worker Interviews
b. 12b. 13b. 14b. 11, f. 55-95	Worker Interviews
b. 15b. 14, f. 96-111	Interview Analysis
b. 16b. 15, f. 112-129	Reports
Framingham Foremen	
b. 17b. 16, f. 130-136	Interview Background
b. 17, f. 137-140	Management and Union interviews
b. 17, f. 141-146	Foremen Interviews
b. 17, f. 147-149	Interview Analysis
b. 17, f. 150-153	Forement Observation Background
b. 18b. 19b. 20b. 21b. 17, f. 154-209	Forement Observations
b. 21, f. 210-223	Foreman Observation Analysis
b. 22b. 21, f. 224-234	Reports: <i>Foreman on the Assembly Line</i>
b. 22, f. 235-240	Reports: Essays
Linden, NJ	
b. 22, f. 241-252	Background
b. 23, f. 253-258	Management and Preliminary Interviews

Series III: General Motors Study > General Motors study > Linden, NJ (continued)

b. 24b. 25b. 23, f. 259-315	Worker Interviews A copy of this material is available in digital form from Manuscripts and Archives. Contact Manuscripts and Archives at beinecke.library@yale.edu to request access to the digital copy.	
b. 26b. 25, f. 316-323	Other Interviews	
b. 27b. 28b. 29b. 26, f. 324-348	Interview Extracts	
b. 29, f. 349-372	Interview Analysis	
b. 30, f. 373-377	Crisis Study	1953
b. 31b. 30, f. 378-389	Follow-up Study	1956-1957
b. 31, f. 390-396	Reports (Published) A copy of this material is available in digital form from Manuscripts and Archives. Contact Manuscripts and Archives at beinecke.library@yale.edu to request access to the digital copy.	
b. 31, f. 397-401	Reports (Unpublished)	
b. 32b. 31, f. 402-405	Reports derived from both Linden and Framingham material A copy of this material is available in digital form from Manuscripts and Archives. Contact Manuscripts and Archives at beinecke.library@yale.edu to request access to the digital copy.	
	New Departure	
b. 32, f. 406-408	Background	
b. 32, f. 409-410	Company Documents	
b. 32, f. 411-414	Data	
b. 32, f. 415	Analysis - Meetings	
b. 32, f. 416-417	Notes	
b. 32, f. 418-419	Report	
b. 34b. 35b. 36b. 37b. 33, f. 1-418	Duplicates	

Series IV: Raytheon Study

This study of Raytheon Manufacturing Company was begun in 1958 with the purpose of examining the nature of work in an industry characterized by both a high level of technological development and rapid pace of on-going changes in technological work processes. The Raytheon study was conducted by the Yale Technology Project, supported in part by a grant from the National Institute of Health. At the same time, the researchers also served as consultants (Charles R. Walker and Associates) to the Raytheon Company.

While many operations of the company were studied for research and consulting purposes, the primary focus of the study was the Mount Department in the

Industrial Tube plant located in Newton, Massachusetts. The Mount Department assembled high quality vacuum tubes for use in government equipment, including missiles, industrial equipment and consumer products. Interviews with management officials of Raytheon and of Industrial Tube began in the summer of 1958 and continued to be important sources of information and analysis throughout the study (section III A). A series of systematic interviews with foremen, supervisors and operators (hourly workers) was conducted in the Mount Department in 1958-1959 (III-D), a period when rising demand for tubes resulted in great pressures and stresses in the plant. These pressures were reflected in the interviews and in the observations being made of plant operations (III E, and reports, XIB), and they were analyzed in the report made to the National Institute of Health (XI C). During 1959 and 1960 many changes were made at the Industrial Tube plant, partly as a result of Walker's analysis of that "Operation Panic." In 1960 a study was made of the effects of those changes (III F, report XI D).

Other studies of Industrial Tube followed. In 1961 an experiment was conducted in Job Enlargement (IV A), in which each operator assembled the entire tube instead of performing one segment of the assembly process in a team sequence. Another period of rising demand in 1961-1962 applied new pressures to the plant, and this "build up" was studied to assess the effect of the changes made since Operation Panic (IV B, report file 161). In 1962 the company proposed to merge the Industrial Tube operation at Newton with the Receiving Tube operation (manufacturing a higher quantity, lower quality tube) located at Quincy, Massachusetts. The material on this merger is somewhat vague, and a merger with another Industrial Tube plant might also have been involved. This was the final subject of the Technology Project's study of Industrial Tube.

A variety of other studies were made at Raytheon between 1960 and 1962. Interviews with executives at the corporate level were made in 1962, with consultation about management policies (V). In 1961 an important study was made of the Receiving Tube plant in Quincy, to serve as a comparison for Industrial Tube. A special study was made of various Receiving Tube departments concerned with engineering (VI, report file 149). In 1960 and 1961 the management policies and problems of two divisions were studied, Power Tube and Semiconductor (VII-VIII, reports XI A). The studies of the corporate level, Power Tube and Semiconductor focused on management, while the Receiving Tube and Industrial Tube studies covered all aspects of production and human relations at these two electronics plants.

b. 38, f. 1-4	Raytheon Study Background	
	Raytheon Company Documents	
b. 38, f. 5-16	Corporate Level	
b. 39b. 38, f. 17-24	Industrial Tube	
b. 40b. 39, f. 25-36	Industrial Tube, Mount Department	
	Industrial Tube	
b. 40, f. 37-47	Management Interviews	
b. 40, f. 48-50	Preliminary Interviews, Mount Department	
b. 40, f. 51-53	Original Interviews - operators	1958 November-December

Series IV: Raytheon Study > Industrial Tube (continued)

b. 41b. 40, f. 54-55	February Interviews - operators	1959 February
b. 41, f. 56-66	Mount Department Observations	
b. 41, f. 67-70	Before and After Study	1960
b. 42b. 41, f. 71-78	Job Enlargement	1960-1962
b. 42, f. 79-87	Build Up	1961-1962
b. 42, f. 88-91	Consolidation with Quincy	1961-1962
Raytheon Corporate Level		
b. 42, f. 92	Summaries of management interviews	
b. 42, f. 93	Management interviews	1962 May 23-28
b. 42, f. 94	Management interviews	1962 May 29 - June 1
b. 42, f. 95	Notes	
b. 42, f. 96	Recommendations	
Receiving Tube		1961
b. 43b. 42, f. 97-101	Raytheon Company Documents	
b. 43, f. 102-106	Interviews	
b. 43, f. 107-111	Engineering Case Study	
b. 43, f. 112-113	Meetings and Notes	
Power Tube		1960-1961
b. 43, f. 114	Raytheon Company Documents	
b. 43, f. 115	Management interviews	1960 May - September
b. 43, f. 116	Management interviews	1960 October - December
b. 43, f. 117	Foreman and supervisor interviews	
b. 43, f. 118-119	Marketing organization interviews	
b. 43, f. 120	Notes on meetings	
b. 43, f. 121	Recommendations and notes	
b. 44b. 43, f. 122-131	Semiconductor	
b. 44, f. 132-141	Consulting	

Series IV: Raytheon Study (continued)

b. 44, f. 142-145	Research Notes
	Reports
b. 45b. 44, f. 146-152	Reports to Raytheon Company
b. 45, f. 153-161	Reports on Mount Department
b. 45, f. 162-163	Report to National Institute of Health
b. 45, f. 164-167	Before and After Study
b. 45, f. 168-171	Repetitive Work
b. 45, f. 172	Job Enlargement - Theories on Job Involvement
b. 45, f. 173	Job Attitudes - "Patterns of Job Attitudes"
b. 47b. 48b. 46, f. 1-173	Duplicate Material

Series V: Photographs, 1863-1921

The Ford Study was conducted by Charles R. Walker and Fred Richardson in the Spring of 1946. This was a period of great stress for the company, a fact which made the project interesting to Walker but also led the Ford management to discontinue the study in order to let the company "clean its own house." The study was wide-ranging, covering policy at the highest level, human relations among the executives, production supervision, and the assembly line itself. Both the corporate offices and the Rouge Plant (over 60,000 workers) in Michigan were studied.

Reflecting the exploratory and preliminary character of the study, the material in the files is rather sketchy. The data about Ford is matched in quantity and interest by material concerning the ambitions, values and techniques of the researchers. The various sections of the study are about equal in interest and importance: none are particularly outstanding, and none should be ignored. No comprehensive organizational chart is available, but a list of the more important individuals involved in the study is attached.

b. 49, f. 1-18	Ford study
	Series VI: Kodak Study
	The Kodak Study was conducted by Charles R. Halker and Robert H. Guest in 1949-1950, with the report being written in 1951. After some preliminary discussion (files 2-3), Kodak management and the researchers agreed upon a study of a program of conferences between workers and department heads that had been instituted in the Cine Kodak and Sheet Film division of the Kodak Park Works in Rochester, New York. Interviews were held at various levels of management and with some hourly employees. The report to Kodak is a simple review of the program, while the draft of an article on the program is quite theoretical (file 9, items 1-2). In addition to the organizational chart, notes on the organization of the departments studied are contained in file 8.
b. 50, f. 1-9	Kodak study
	A copy of this material is available in digital form from Manuscripts and Archives. Contact Manuscripts and Archives at beinecke.library@yale.edu to request access to the digital copy.

Series VII: Dresser Study

The studies of the Dresser Industries, specifically the Dresser manufacturing Company at Bradford, Pennsylvania and the Roots-Connersville Blower Corporation at Connersville, Indiana, were consulting projects in emphasis, rather than research projects. The studies focused on specific problems of interest to management: human relations within the Bradford plant (report, File 17), the relationship between the individual companies and the parent corporation (File 18), and the special situation at Roots (internal tensions and poor relations with Dresser Industries; Files 19-23). Discussions with Dresser began in 1948, most of the work was done in 1949, and completed in 1950, while correspondence continued until 1957. The files are somewhat uneven in content. Some research material (interviews and observations) was not saved, particularly in the Roots-Connersville study. The final reports are quite comprehensive, and many of the company documents are significant.

b. 51, f. 1-23

Background

Series VIII: U. S. Steel Study

The United States Steel Project consisted of two distinct studies: 1) the pending move of a steel plant from Ellwood City, Pa. and its affect on the plant, community and union, and 2) the semi-automation of the Lorain Works in Ohio and its social and psychological effect on the workers and work teams. The studies began in 1946 and were completed in 1952.

Ellwood City

On August 1, 1946, the National Tube Company, a division of USS, announced its plans to move its Ellwood City operations to Gary, Indiana, within 2 to 3 years. The Ellwood City works employed two-thirds of the city's industrial wage earners, and the announcement shocked the plant, union and community.

The investigation of Ellwood City and the pending mill move was one of the most thorough surveys made by the Yale Technology Project. It involved an extensive examination of the city itself, of the Ellwood City Works, of the union and of top USS and National Tube management. Questions ranged from the most general to the most abstract (How to handle technological change in industrial society? What is the large corporation's responsibility and purpose?) to the small but important matter of "What effect will this have on any one particular worker and his family?" "Will a certain downtown business have to close due to the mill move?"

The collected data included interviews (see files 21, 23, 65-90) with townspeople, with mill workers and mill families; with all levels of management, including top USS management; with union members and union leaders, including the International Representative.

The interviews were supplemented by many documents (see files 18, 22, 47-64): plant, union, community and regional documents. Data from 611 spheres of community life (social, recreational, religious, educational, business) were collected. A thorough analysis of the local newspaper was done for one year.

Many working papers and reports evolved from this study but most important of all, and the best introduction to the study, is the book *Steel/town*. It tells the story clearly and includes in its supplement some of the more important working reports.

Lorain

In January of 1949, USS opened the first continuous seamless pipe mill in the US, at Lorain, Ohio. This innovation constituted a long step toward the automatic

factory. It improved product quality, increased production with fewer workers, improved working conditions and decreased the need for muscle while demanding greater mental attention. The purpose of the Lorain Project was to analyze the social and psychological effects of technological change on industrial workers and works groups.

Interviews with management of all levels, Crew members and local union representatives were made (see files 28, 162-192). Three rounds of interviews were conducted with all members of the three hot mill crews in their homes. Company documents (see files 24, 152-160) were studied and many in-plant observations were made. As a preliminary investigation of 6 weeks, Frederick L.W. Richardson, Jr. made a study of the community entitled: "Community Problems and Group Conflicts" (see file 146).

Several working papers evolved (see files 205-207) dealing with such topics as union-management relations, the immediate job, incentives, worker attitudes toward management, and the crew as a team. The best introduction, however, is the book *Towards the Automatic Factory*.

b. 53b. 54b. 55b. 56b. 57b. 58b. 59b. 52, f. 1-139	Elwood City
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b. 60b. 61b. 62b. 63b. 59, f. 140-222	Lorain
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b. 65b. 64, f. 3-165	Duplicates
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Series IX: IBM Study

The IBM project was simple in most respects and the research material may be readily studied. Besides the various items in the background files (files 01 - 05), the best introduction to the study is the group of reports written about it (file 67), particularly the monograph by Charles R. Walker and F.L.W. Richardson, Jr., *Human Relations in an Expanding Company*.

The Company Documents (file 06 - 16) contain some background material and much that is directly related to the study. Many of the research findings were formulated in charts and diagrams, contained in files 26 - 35 and 41 - 42. The interviews (files 17 - 24) and research notes (files 36 - 40) are obviously important. Little material is contained in the drafts or the articles and of the monograph (files 50 - 66) that was not in the published versions (file 67) but the specific reports written during the study (files 43 - 49) should be consulted. The contents of the binder notes (Section VI) were later typed and appear in the various files, and therefore need not be studied.

The Tables of Contents accompanying this guide and placed in the respective files were prepared for files which seemed to require some explanation. Files which have no table are not necessarily unimportant.

It was necessary to add several items after the study had been arranged; hence, files 4a, 4b, 4c, 4d; and 68a, 68b, 68c, 68d and 68e. Also, there are many notes of interest in file 40 "Miscellaneous Notes" due to the addition.

How the IBM Study was conducted

This study of the IBM plant in Endicott, New York, was begun in the spring of 1946 with the purpose of examining the organizational structure of a plant which experienced improved relations despite rapid expansion.

For purposes of simplification, research was concentrated on those departments directly concerned with production: Machining, Assembly, Production Control and Inspection. The time periods of 1940 and 1947 were compared to describe certain organizational changes which normally do not occur in an expanding company:

- reduction of levels in the supervisory structure
- reduction of number of employees and foreman
- job enlargement in the job content of many workers, some supervisors and all foremen

Observation of plant operations (see III.B. and III.C.) and informal interviews with management (see III.A.) (most of the 1940 supervisors were still available) coupled with basic data for the two periods, supplied the bulk of information. There were few interviews with hourly employees.

The plant's "social framework" was studied in terms of horizontal and vertical contacts - noting purpose, function, frequency, duration, who initiated and who responded. This framework was studied in conjunction with the technical environment (including plant layout and workflow).

Workflow and job enlargement were important topics in the general study and were the subjects of separate reports (see V.E.).

b. 67b. 68b. 69b.
70b. 71b. 66, f.
1-75

IBM Study

b. 71

Binder Notes

b. 72, f. 2-75

Duplicates

General Electric Study

The GE Project consisted of two similar though separate studies, one at the Schenectady Plant and the other at the Syracuse Plant (both in New York State). They both dealt with a change in the organizational structure of the plants. Schenectady management omitted the position of general foreman and wanted to take a look at what this meant and would mean in the future for the foreman's job. The Technical Products Department in Syracuse reordered its personnel structure, omitting the wiremen and installing a new group called the "Pre-production Unit." Both of the changes affected much more than simply the immediate positions and employees with new titles or new responsibilities.

Schenectady

In early 1958 GE and local plant management concluded that the foreman's job needed re-examination. The position of the general foreman had recently been omitted thus giving the foreman (and others) new responsibilities and new problems. Management had three aims:

- to broaden the foreman's responsibility and control over his production area
- to strengthen his relationship with his employees and
- to increase his stature within management and so increase the satisfaction he may derive from his position

The Yale Researchers combined quantitative data derived from surveys and observations (see files 18, 19, 20, 44) with a case-study approach based upon interviews (see Section II.B.) of foremen, former general foremen, service managers, supervisors, specialists and technicians, the Superintendent, the Product Section Manager, the Union Relations Specialist the Employee Relations Manager and the Departmental General Manager, to determine the situation.

The findings can be summarized as follows:

The general foreman had performed many duties, in addition to the fondly designated ones, which were not appreciated before the change.
After the change, the foreman had to deal directly with service groups.
Manpower allocation was still presenting a problem when the study was being done.
Three quarters of the foreman's time was spent on production matters.
Only thirty-four minutes a day were spent on employee relations (not enough time).
The foreman clearly had a new relationship to the Superintendent, his new boss, which presented some problems.
The foreman's promotion opportunities changed.
Communications down from management to foremen and workers were good, but upward communications were unsatisfactory.
The foremen needed help in dealing with their new "Union Relations" responsibilities.
The communications and services of the Employee Relations Section were considered inadequate.
The foremen needed more technical assistance.
The scope of the technical assistant's job needs clarification.

Generally, the foremen found their new jobs to have too much, to be too insecure, not high paying enough and lacking in promotional opportunities. But they did like the challenge and frequently found it rewarding.

Progress had been made toward the three goals although more work needed to be done on the last two.

Syracuse

The Syracuse plant manufactured electronics products - about one-fifth of which were built to customer specifications. There was a high ratio of engineers to operators because there was a constant need to innovate in order to remain competitive.

"At the time of the study" wrote Jasinski and Guest in the Final Report, "the workflow on a new product, or a major revision...was similar to...other organizations. An idea was evaluated and the product designed in the engineering group. A prototype was constructed....Once the product was 'proved' and the necessary paper work completed, it was turned over as a whole to the manufacturing section. Up to this point, there had been very little exchange between engineering and manufacturing." This was the situation before the creation of the "Pre-production Unit." Management realized that time was being wasted and flexibility was lacking. In some way, engineering and manufacturing must be in closer communication.

Management's goals were the following:

To improve product design and thereby increase "manufacturability"; this would involve a closer matching of design with manufacturing capabilities and would permit standardization and simplification of production procedures.
To allow for better advanced planning by improving the quantity and quality of information available to management to enable them to attain optimal use of available facilities and personnel.
To reduce paper work.

These goals would reduce product cycles, reduce in-process inventory and increase production effectiveness.

In order to achieve these goals, management developed the "Pre-production Shop." The pre-production workers replaced the category of "wiremen."

They worked in a pre-production area and all of them reported to the same supervisor. They assembled an entire unit and worked closely with the planner and production specialist and with the engineer and draftsman associated with the unit.

The results of installing this Pre-production shop (in terms of the original goals concerning product cycle time, inventory and manufacturing efficiency) were very favorable. Development time was reduced even though the pre-production shop constituted an extra step in the procedure. Inventory fell 62 percent. And manufacturing performance rose 40 percent in four months. This greatly reduced costs.

There were the following unanticipated goals as well:

- increased flexibility in production
- increased time available to the engineers for straight engineering
- high morale among the pre-production workers
- internal effectiveness of the pre-production shop

About the Files

Of the General GE Company Documents, only the Questionnaires and the Research Service Reports (Files 7 and 8) are of particular use in understanding the Schenectady study. The rest are about or by GE in general.

As always, the Notes and Correspondence (I.C) are important.

The Schenectady Study Files

Of course, the Statement of the Problem and Plan of Research is vital to the Study (File 16). The proposal for a consulting relationship does not state the problem exactly; the study evolved into one of the Foreman's Job rather than the general implications of the omission of the level of the General Foreman.

File 17 contains the Questionnaires which should be used in conjunction with the interview answers. Only interviews which did not follow the questionnaire or cover the same material have descriptions in the Tables of Contents.

The Organization Charts and Personnel Data should be consulted and some of the Company Documents are important (Files 18, 19 and 20) . The Correspondence (File 21) is as usual necessary to understanding the study.

The Interviews (Section I I .B.) provide the basic data and should be reviewed carefully. The Interview Extracts (Files 27 through 43) are grouped by topic and question.

The Final Report is located in File 52.

The Syracuse Study Files

The Statement of the Problem and the Plan of Research (File 53) should be reviewed carefully. The other Background Files are important, too. They contain the Questionnaire (File 55) the Organization Charts (File 56) and some very useful Notes (File 54).

Files 57 and 58 of the Company Documents and some of the documents in File 60 are of particular use. The photographs however interesting, are not vital to the Study.

The Correspondence should be reviewed (File 61).

The Interviews are in Section III.D. and provide much of the basic data. The Interview Extracts are arranged according to question and topic.

General Electric Study (continued)

Besides the Interviews, Data and Notes on Personnel and Production provide the data for analysis (Files 77-79). They are of especial importance.

The Final Report is located in File 83.

b. 74b. 75b. 76b. 73, f. 1-83	General Electric Study A copy of this material is available in digital form from Manuscripts and Archives. Contact Manuscripts and Archives at beinecke.library@yale.edu to request access to the digital copy.
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b. 76, f. 2-79	Duplicates
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Series XI: Merck Study

The Merck study was conducted by Charles R. Walker, Robert H. Guest and Arthur N. Turner in 1951 and 1952. The focus of the study at the Rahway, New Jersey plant was on management policy in advanced-technology industry. Reports were prepared on management organization (file 49), workers' attitudes (file 52-53) and supervisors' attitudes (file 54). Material on the nature and purposes of the research can be found in the background files (file 3, 5), in some preliminary observations (file 48) and in the final reports.

Since the study was a consulting program as well as a research project, different sections of the Rahway plant, and different problems within the plant, were studied in response to management requests. These separate investigations were substantially alike, however, and the files have been organized to form one group. The organizational charts (file 8) may be consulted to determine the position of particular sections or individuals. These charts are also useful in reviewing the material concerned with problems in the organizational structure itself (file 49, 54, and many management interviews).

Interviews with the hourly workers are presented here in two forms. Each interview is filed intact according to the workers' names in files 32-37, and answers to particular questions are grouped in files 38-46. These answers are tabulated in file 47 and the final reports are in file 52-53.

One file deserves particular attention. File 49 contains drafts (no final copy exists) for a report on Morale and Labor Relations. This report covers management organization and labor relations comprehensively and it is also the most analytical report on Merck.

b. 78b. 79b. 80b. 81b. 77, f. 1-54	Merck Study
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b. 81	Duplicates
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Series XII: Jones and Laughlin Steel Study

The study of Jones and Laughlin spanned a three-year period: 1950 to 1953. It consisted of five distinct though similar parts:

- a study of training and labor relations at the Pittsburgh Works
- a training program written by Charles R. Walker entitled "Jones and Laughlin and the American Economy"
- an investigation into labor and human relations at the Monongahela Connecting Railroad (called Moncon), a subsidiary of J&L
- a study of the Otis Works (in Cleveland) with particular attention given to union-management relations and the problem of incentives
- the beginnings of a study at Aliquippa (it was cut short by a change of consulting policy by top J&L management)

Final reports were written for the Pittsburgh study (see file 22), the Course on J&L and economics (see the entire division) and for the Moncon survey (see file 34). These make good introductions to the studies. For an introduction to the Otis study, see file 47 "Reports" which includes a 6-point action program by Charles R. Walker. This suggests the main subjects of investigation.

The study of Aliquippa was cut short by J&L top management (see file 5, item 15). It is little more than a few notes, interviews and documents.

b. 83b. 84b. 85b. Jones and Laughlin Steel Study
82, f. 1-51

Series XIII: New York Trust Study

The study of the New York Trust Company, beginning in 1955 and continuing through 1954, was a consulting program designed to help the bank assess its personnel policies and improve the morale and qualifications of its employees, particularly those at the upper levels. The heart of the study was the series of interviews with most of the executive officers and many of the senior clerks in all of the divisions of the bank. These formed the basis of the reports to the bank and the counseling on the bank's educational program.

On the nature of the consulting program, see the statement in file 02 and the correspondence, especially the first four items, in file 03. Among the documents, the comprehensive organizational chart (file 07, item 1) is an essential reference.

The interviews were conducted by Charles R. Walker, Arthur N. Turner and Robert N. Guest. They all followed a similar pattern (see file 10), covering the employee's work history, job duties; comments on personnel policies and practices and suggestions for the educational and training program. The interviews are quite comprehensive and are rich in accounts of incidents and reflections about the bank. The interview extracts (files 12-28) constitute sentence or paragraph length comments on the various topics covered.

The training and educational program was established and run by the bank itself, with advice from the researcher-consultants. Thus files 29-52 contain mostly company documents. The program was run by a Committee on Education formed in 1953 with senior officers as members. Some of the correspondence (file 03) concerns the training. The Committee supervised the courses on banking given to the officers and also considered the bank's policies on other personnel matters, including turnover, transfers and promotion. Except for the sketch in file 42, all of the reports written by the consultants (files 35-42) were written for the Committee on Education. The Harvard Business School case studies (files 43-44) were considered as models or teaching materials for the bank's classes.

b. 87b. 88b. 86, f. New York Trust Study
1-44

Series XIII: New York Trust Study > New York Trust Study (continued)

b. 88, f. 1-44

Duplicates

Series XIV: AVCO Study

The Avco Study was a consulting project that began in 1953 and ended in 1957. The Lycoming division's plant in Stratford, Connecticut was a new aircraft engine factory that was having problems related to its rapid growth, its fluctuating business and its management morale. Charles R. Walker and Associates were hired to make a report on supervisory morale (see file 62) and then served as consultants advising on a wide range of problems. The consultants, mainly Frank J. Jasinski and Robert H. Guest but also Arthur N. Turner and Charles R. Walker, became deeply involved in the management process, sometimes acting as managers as well as advisors. Thus the study was not a simple objective survey, but a distillation of the company's experiences over a period of several years.

This complex consulting role is reflected in the material in the files, which could be thoroughly described in the tables of contents only at the cost of excessive time and expense. The research material can only be thoroughly understood by actually going through it. The tables of contents of the important files simply list and identify the items, without attempting a descriptive summary of them. While the most important dimension of the study was chronological (changes over time) rather than organizational (conflicts between different levels of management) the files have been arranged so as to sort out the complex organization of the Division.

A separate plant, at Williamsport, Pennsylvania, within the Lycoming Division is treated in two files (58, 70). Two major manufacturing units at the Stratford plant were studied: the Jet operation, and the Reciprocating Engine Operation, commonly called the Wright operation. Other units, notably the Gas Turbine project, affected Jet and Wright, but they were not studied directly. A great deal of attention given to the general management of the plant, that is, the chief executives and the middle management officials in the service departments (such as industrial relations, quality control and engineering). The files have been organized along these lines.

Organizational boundaries were not always clear in the consulting program or in the operations of the plant. In 1953 and 1954 Wright and Jet were a study in contrast, but thereafter the consultants usually dealt with the Division as a whole or with particular problems in many areas of the plant. In addition, Lycoming had a very fluid management corps. Turnover was high and transfers were frequent. Changes in personnel, rank and duties are not always recorded clearly. A list of executives and their changing assignments is attached to this guide as an aid in reducing the confusion.

As the list of Reports (files 61-72) suggests, the Avco study was both wide-ranging and compact. Many topics were covered and little of the material in the files is unimportant. Among the company documents, the organizational charts, the personnel material and the management development program are especially important (files 06-08). The union grievance described in file 15 was a major incident. The researchers' notes on management meetings (files 46-50) are probably more useful than the official minutes (files 16-25).

Of course, the heart of the study is contained in the management interviews and observations. The interviews with the general foremen and foremen were not in-depth and were infrequent after 1954, but the talks with higher officials were frequent and very comprehensive. The observations include a variety of material: reports on specific incidents and the general events of the day; brief conversations with a series of people (rather than individual interviews); and some interviews with some persons who did not fit - as far as could be determined - into the regular organizational framework.

Of the Departmental Surveys, the study of Department 3-D is especially important (file 52). At the request of management, one foreman in 3-D was closely observed for an entire working day in order to record and analyze all his activities (file 54). The production survey and personnel statistics were part of an effort in 1955-1956 to analyze the plant's problems with low production (files 59-60).

All of the reports are significant, but the Report on Supervision is comprehensive, providing the context for the work that followed.

b. 90b. 91b. 92b.
93b. 89, f. 1-72

AVCO Study

b. 94, 93

Duplicates

Series XV: Research Files

b. 96b. 97b. 98b.
99b. 100b. 95, f.
1-48

Research Files

Series XVI: Research Pamphlets

b. 102b. 101, f.
1-67

Research Pamphlets

Series XVII: Research Periodicals and Government Publications

b. 103, f. 1-40

Research Periodicals

b. 104, f. 1-14

Government Publications

b. 105, 108, 107,
106

Duplicates

Appendix: Annotated List of the Studies

Ford. Rouge Plant, Michigan, 1946. A brief study of corporate policy and the assembly line. Major data: management interviews, observations, statistics on labor problems. (18 files)

IBM . Endicott, New York, 1946-1947. Study of improved morale through simplifying the organization and job enlargement, despite rapid growth. Major data: Management interviews, diagrams of organization and work-flow. (79 files)

US Steel. Ellwood City, Pennsylvania and Lorain, Ohio. 1946-1956. Ellwood City: study of the planned departure of the steel mill and its effect on the community. Lorain: study of automation. Major data: interviews with management, workers, union officials, community members. (222 files)

Dresser. Bradford, Pennsylvania and Connersville, Indiana. 1949-50. Consulting project on morale within the plants and their relations with the corporation. Major data: management, worker and union interviews, and observations. (23 files)

Kodak. Rochester, New York, 1949-1951. Consulting report on program of management-worker meetings. Major data : management and worker interviews. (9 files)

GM. Framingham, Massachusetts, Linden, New Jersey, Meriden, Connecticut, 1949-1957.

Framingham: study of workers and foremen on the assembly line. Linden: study of workers and of improvements in management. Meriden: study of technical change at a New Departure plant. Major data: management, worker and union interviews; observation of foremen. (419 files)

Jones and Laughlin. Pittsburgh and Aliquippa, Pennsylvania; Cleveland, Ohio. Pittsburgh Works: labor relations and training. Monongahela Railroad, Pittsburgh: labor relations and human relations. Aliquippa: labor relations. Otis Works, Cleveland: labor relations and management. Major data: management interviews and observations. (51 files) 1950-1953.

Merck. Rahway New Jersey, 1951-1952. Consulting study of supervisory and worker morale. Major data : management and worker interviews. (54 files)

New York Trust. New York City, 1953-1954. Consulting study of management training and morale. Major data: management interviews. (44 files)

Avco. Stratford, Connecticut, 1953-1957. Consulting study on management morale. Major data : management interviews, notes on meetings, foreman observation. (72 files)

GE. Schenectady and Syracuse, New York, 1957-1959. Study of management organization and product development operation. Major data: management and worker interviews. (83 files)

Raytheon. Massachusetts and Maine, 1958-1962. Research on work and morale, plus consulting on management problems. Major data: management and worker interviews, job enlargement experiment. (173 files)

Selected Search Terms

The following terms have been used to index the description of this collection in the Library's online catalog. They are grouped by name of person or organization, by subject or location, and by occupation and listed alphabetically therein.

Subjects

Industrial relations
Industrial sociology
Technological innovations
Technology assessment
Technology -- Social aspects
Working class

Names

Guest, Robert H., 1916-
Turner, Arthur N. (Arthur Nicholson), 1921-
Udy, Stanley H., 1928-
Walker, Charles R. (Charles Rumford), 1893-1974

Corporate Bodies

Avco Corporation
Dresser Industries, inc
Eastman Kodak Company
Ford Motor Company
General Electric Company
General Motors Corporation
International Business Machines Corporation
Jones & Laughlin Steel Corporation
Merck & Co
New York Trust Company
Raytheon Company
United States Steel Corporation
Yale Technology Project