IMPLICATIONS OF AUTOMATION and Other Technological Developments

A Selected Annotated Bibliography

Bulletin No. 1319

UNITED STATES DEPARTMENT OF LABOR
Arthur J. Goldberg, Secretary

BUREAU OF LABOR STATISTICS
Ewan Clague, Commissioner

OTHER BLS PUBLICATIONS ON AUTOMATION AND PRODUCTIVITY

Technological Change and Productivity in the Bituminous Coal Industry, 1920-60 (Bull. 1305, 1961), 136 pp., 65 cents.

Trends in technology and productivity and implications for employment, unemployment, wages, prices, and profits.

Indexes of Output per Man-Hour: Petroleum Refining Industry, 1919-59 (January 1962) 20 pp. Free.

Indexes of output, employment, man-hours, and output per man-hour. Includes characteristics of industry, analysis of trends, tables, charts, and technical notes.

Impact of Automation (Bull. 1287, 1960), 114 pp., 60 cents.

A collection of 20 articles about technological change, from the Monthly Labor Review.

Adjustments to the Introduction of Office Automation (Bull. 1276, 1960), 86 pp., 50 cents.

A study of some implications of the installation of electronic data processing in 20 offices in private industry, with special reference to older workers.

Studies of Automatic Technology (Free).

A series of case studies of plants introducing automation. Describe changes and implications for productivity, employment, occupational requirements, and industrial relations.

A Case Study of a Company Manufacturing Electronic Equipment.
The Introduction of an Electronic Computer in a Large Insurance Company.
A Case Study of a Large Mechanized Bakery (Report 109).
A Case Study of a Modernized Petroleum Refinery (Report 120).
A Case Study of an Automatic Airline Reservation System (Report 137).

Trends in Output per Man-Hour in the Private Economy, 1909-1958 (Bull. 1249, 1959), 93 pp., 50 cents.

Indexes of output per man-hour, output, and employment in major sectors. Analysis of trends and factors affecting changes.

Indexes of Output per Man-Hour for Selected Industries, 1939 and 1947-60. Annual Industry Series (December 1961), 21 pp. Free.

Indexes of output per man-hour, output per employee, and unit labor requirements for 22 industries, including coal and metal mining, various foods and fibers, basic steel, etc.

Labor Requirements for School Construction (Bull. 1299, 1961), 50 pp., 35 cents.

The first of a series of studies of on-site and off-site labor requirements in each of the major types of construction.

Sales publications may be purchased from the Superintendent of Documents, Washington 25, D.C. from regional offices of the Bureau of Labor Statistics at the addresses shown below. Free publications are available, as long as the supply lasts, from the Bureau of Labor Statistics, U.S. Department of Labor, Washington 25, D.C.

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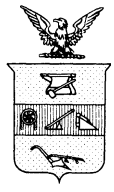

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Appendixes

IMPLICATIONS OF AUTOMATION AND OTHER TECHNOLOGICAL DEVELOPMENTS

A Selected Annotated Bibliography

Introduction

This bibliography is a guide to the voluminous literature recently published about the benefits and problems of automation and related technological changes. Because changes in technology underlie many critical manpower developments, public interest has been greatly intensified in the progress and implications of these innovations.

Scope and Limitations

This bibliography lists over 500 references. It supplements BLS Bull. 1198, Automatic Technology and Its Implications (a bibliography published in August 1956 and now out of print). The current bulletin covers primarily publications issued since 1956. Only a few important items from the previous publication have been included in this bulletin.

Books, articles, reports, pamphlets, speeches, conference proceedings, and other readily available materials are included. The term "automation" is used broadly to cover a variety of technical developments. A number of references describing these developments in different industries, useful to the nonspecialist, are listed. Most of the references, however, relate to the social and economic aspects of automation: the implications for employment, unemployment, occupational and skill requirements, training and retraining, collective bargaining, business management and organization, and the progress of automation in other countries.

No effort was made to include references on certain subjects indirectly related to the general topic, such as the problem of economic growth and stability; the impact of research; and the history of science and invention. Publications in foreign languages are also excluded.

Because of the great interest in the subjects covered, an annual supplement will be issued to bring the bibliography up to date. Important references that may have been overlooked in preparing this bulletin will be included.

Using the Bibliography

Effective use of the bibliography may be facilitated by the following features:

Classification by Subject. References are classified under 11 broad topics. The second section, on technology, is further divided into 21 subdivisions covering different industries. When a reference pertains to more than one section, it is listed only once, under the section to which a major portion of it relates. References in sections 1, 3, and 4 are broad in scope, often including several topics.

Alphabetical Arrangement by Authors. References are arranged and numbered alphabetically by author within each section. The number to the left of the decimal indicates the section and the number to the right represents the item within the section.

Brief Annotations. References are briefly annotated, except most of those on technical trends in specific industries listed in section 2, to indicate the subjects covered.

List of Visual Aids on Automation. Appendix A contains an annotated list of available films on automation. Inquiries should be directed to the source given in the film citation.

Index to Authors. Appendix B presents an alphabetical listing of authors, with the numbers of all references cited. Writers of articles included in collections are not listed unless given in the reference.

Index to Subjects. Appendix C presents an alphabetical listing of subjects with the number of all references related to them. Where a reference is related to more than one subject, it is cited under each subject.

Periodical and Publisher List. Appendix D is an alphabetical listing of periodicals and publishing organizations, with addresses, cited in the bibliography.

This bibliography was prepared in the Bureau's Division of Productivity and Technological Developments by James R. Alliston, under the direction of Edgar Weinberg, Chief, Branch of Technological Studies. William Alli and Richard Lyon assisted in annotating references.

SECTION 1 - IMPACT OF AUTOMATION AND TECHNOLOGICAL CHANGE: SOME GENERAL SURVEYS

This section includes references to publications providing general discussions on the concept, scope, development, and characteristics of automation as well as the economic and social implications of automation for management, labor, government, education, leisure, culture and philosophy.

1.01 Barkin, Solomon. "Implications of Developments in Automation for Our Economy," The American Economy: An Appraisal of Its Social Goals and Impact of Science and Technology, Haig Babian, editor (New York, Joint Council on Economic Education, 1958), pp. 97-113. Reprinted by Textile Workers Union of America, Research Department, New York.

Implications for the industrial system, productivity, plant obsolescence, depressed areas, full employment, collective bargaining, and occupational requirements.

1.02 Barkin, Solomon. "More Implications of Automation," I.U.D. Digest, Fall 1959, pp. 115-123. Reprinted by Textile Workers Union of America, Research Publication No. P-221B, New York.

Implications for skills, productivity, research, management, unions, and economic stability.

1.03 Barkin, Solomon. "Statement Before the Subcommittee on Unemployment and the Impact of Automation" (and 3 papers), Impact of Automation on Employment; Hearings, U.S. House of Representatives, Committee on Education and Labor, 87th Cong., 1st sess., March 21, 1961 (Washington, U.S. Government Printing Office, 1961), pp. 170-256.

Developments in the textile industry. Implication for productivity; obsolescence of industrial processes, plant, and skills; job patterns and depressed areas and communities, with New York examples. National programs proposed to accelerate application of automation and collective bargaining agreements for cushioning adjustment of workers.

1.04 Brozen, Yale. "The Economics of Automation," American Economic Review, May 1957, pp. 339-350.

Influence of recent inventions, growth in capital, and rising marginal productivity of labor on technological change. Effects of automation on the capital-labor ratio in the national economy and the railroad and automobile industries.

1.05 Buckingham, Walter. Automation: Its Impact on Business and People (New York, Harper, 1961). 196 pp.

Fundamental principles, history, extent, characteristics, objectives, and limits of automation. Effects on management theory and practice, industrial organization and structure, small business, prices, stability, and economic growth. Social implications for leisure, cultural progress, and philosophy.

1.06 Buckingham, Walter. "The Human Side of Automation," Personnel Administrator, May/June 1961, pp. 1-2 ff.

Reason for automating. Effects on commerce, management, and labor: specifically, on basic philosophies, skills, working conditions, emotional hazards, and labor displacement.

1.07 Colomb, Serge and Lienart, Pierre. About Automation (Paris, Trade Union Information and Research Service, European Productivity Agency, Organization for European Economic Cooperation, 1956). 62 pp.

Technical and economic problems: productivity, price and quality, investment, competition, industrial structure, production and markets, new skills, and extent and rate of introduction. Problems for trade unionists: employment, labor mobility, working conditions, safety, wages, hours of work, and leisure.

1.08 Cornog, Geoffrey Y. "Automatic Data Processing--Dr. Jekyll or Mr. Hyde," Public Administration Review, Spring 1961, pp. 105-114.

Review of Congressional hearings, Government reports, and other literature on implications of automatic data processing for employees and management in industry and government. Effects on displacement and occupational change, management organization and control, work environment and satisfaction.

1.09 Diebold, John. Automation: Its Impact on Business and Labor (Washington, National Planning Association, 1959). 64 pp.

Developments in manufacturing, processing, and office work and implications for labor, upgrading and downgrading, retraining, and society as a whole. Presents a framework for a study of the extent of automation, rate of introduction, and effects on management and labor. Policy statement by the NPA.

1.10 Dreher, Carl. Automation: What It Is, How It Works, Who Can Use It (New York, W. W. Norton & Co., 1957). 128 pp.

Popular discussion of nature and examples of automation, technological history, and rate of development. Description and implications of automation in communications, transportation, manufacturing, data processing, and research. Implications for economic growth, small business, and military and welfare spending.

1.11 Drucker, Peter F. America's Next Twenty Years (New York, Harper, 1957), "The Promise of Automation," pp. 17-34.

Implications for business management, production, employment, displacement, qualifications and functions of workers, upgrading and downgrading, education, and economic stability. Principles of automation.

1.12 "Effects of Business Automation in the Sixties," Management and Business Automation, January 1961, pp. 18-23 ff.

Roundtable discussion by six business experts. Effects on employment, banking, outlook for electronic data processing, and computer's role in business forecasting.

1.13 Einzig, Paul. The Economic Consequences of Automation (London, Secker & Warburg, 1957). 226 pp.

Economic and social aspects, advantages and disadvantages of automation. Implications for employment, unemployment, production, inflation, wages, profits, prices, capital requirements, business cycles, monetary and fiscal policy, balance of payments, underdeveloped countries, and national defense.

1.14 Electronic Industries Association. Automation Systems; Proceedings, 2d EIA Conference on Automation Systems for Business and Industry (New York, Engineering Publishers, 1958). 180 pp.

Discussion of automation within and outside electronics industry and its economic, training, education, and social aspects.

1.15 Gass, J. R. "Research Into the Social Effects of Automation," International Social Science Bulletin, Vol. 10., No. 1, 1958, pp. 70-83.

Survey of research work on the implications of automation: social effects of productivity increase; effects on skills, occupational structure, and work satisfaction; case material showing effects on employment, wages, and hours of work. Task of the social scientist, circumstances favorable to his success, and dangers.

1.16 Goldberg, Arthur J. "Challenge of 'Industrial Revolution II'," New York Times Magazine, April 2, 1961, pp. 11 ff. Condensed in Management Review, May 1961, pp. 51-53.

Concept and development of present needs for automation. Effects on productivity, employment, unemployment, and labor-management relations. Examples of joint advance planning for automation and of community retraining programs to update skills.

1.17 Goodman, L. Landon. Man and Automation (Harmondsworth, Middlesex /Eng./, Penguin Books, 1957). 286 pp.

Applications of automation in industry, offices, insurance, banking, commerce, catering, warehousing, transport, and building. Impact on labor, management, trade unions, and education.

1.18 Greenberg, Leon. "Statement before the Subcommittee on Unemployment and the Impact of Automation," Impact of Automation on Employment; Hearings, U.S. House of Representatives, Committee on Education and Labor, 87th Cong., 1st sess., March 10, 1961 (Washington, U.S. Government Printing Office, 1961), pp. 85-108.

Reviews work and plans of Bureau of Labor Statistics in studying automation. Discussion of findings of BLS studies on automation as affecting layoffs, retraining, transfers, skills, growth of new industries, etc.

1.19 Great Britain, Department of Scientific and Industrial Research. Automation: A Report on the Technical Trends and Their Impact on Management and Labour (London, Her Majesty's Stationery Office, 1956). 106 pp.

Concept of automatic production and trends in production, process control, and data processing. Factors governing extent and rate of development. Impact on management organization, manpower requirements, employment, skills, and work satisfaction, with illustrative company case studies.

1.20 Halsbury, Earl of. "Integrating Social with Technological Change," Impact of Science on Society, March 1957, pp. 3-15.

Transition from primitive to industrial man. Worker-manager relationships. Challenge to industrial psychology.

1.21 Hugh-Jones, Edward Maurice, editor. The Push-Button World; Automation Today (Norman, Okla., University of Oklahoma Press, 1956). 158 pp.

Essence of technology of automation. Implications for labor, management, unions, upgrading, training, leisure, living standards, and mental fatigue. Changes in skills, employment, unemployment, and productivity.

1.22 International Labor Office. Automation (Geneva, 1958). 26 pp.

Concept of automation. Impact on jobs, skills, training, retraining, layoffs and reemployment, safety, job satisfaction, social security, management, trade unions, and government.

1.23 International Labor Office. "Automation and Other Technological Developments," Pt. 1, Report of the Director-General to the 40th sess., International Labor Conference (Geneva, 1957). 105 pp. Excerpted in Monthly Labor Review, July 1957, pp. 841-845.

Recent worldwide trends and pace of automation, atomic energy, and other technological changes. Impact on employment, skills, education and training, planning, layoffs and recalls, labor mobility, wages and hours, safety and health, and job satisfaction.

1.24 Jacobson, Howard Boone and Roucek, Joseph S., editors. Automation and Society (New York, Philosophical Library, 1959). 553 pp.

Reports on automation in automobile, metalworking, electronics, telephone, and railroad industries, data processing, teaching, and the post office by 15 business and labor leaders, educators, publishers, and government officials. Also 16 papers on economic, social, and political implications. Automation in the USSR. Includes a glossary of automation terms, and 37 short technical case studies.

1.25 Lilley, Samuel. Automation and Social Progress (New York, International Publishers, 1957). 224 pp.

Development of automation and technical forecast of its progress, particularly in engineering and automobile industry. Implications for labor productivity, production costs, skills, working conditions, employment, and monopoly. Problems and policies for socialist and capitalist economies.

1.26 Macmillan, Robert Hugh. Automation, Friend or Foe? (Cambridge /Eng./ University Press, 1956). 100 pp.

Historical landmarks in the development of automatic control and production. Economic advantages and difficulties. Problems of control system design. Influence of electronic computers on future developments. Based on radio talks and lectures.

1.27 Maher, Edward I. Automation: A Background Memorandum (New York, National Association of Manufacturers, April 1960). 13 pp.

Presents management's basic views on automation's effects on jobs and people. Recommends policies.

1.28 Massachusetts. Governor's Conference on Automation; Proceedings, June 2-3, 1960 (Boston, Harvard University, Graduate School of Business Administration, 1960). 40 pp.

Statements and discussions by 18 leading officials from management, labor, government, and universities. Programs proposed to stimulate automation. Organized labor's programs and collective bargaining approaches to alleviate hardships. The role of government. Implications for economic development, investment, community readjustment, social legislation, unemployment, standard of living, wages, education, training, retraining, skills, maintenance, medicine, placement services, and equipment.

1.29 Moos, S. "The Scope of Automation," The Economic Journal, March 1957, pp. 26-39.

Rate of development and extent to which automation will influence structure of industrial organization: size and location of firms, growth of new industries, employment and investment, and size of production run. Industries already affected and those likely to be affected. Nature and size of electronic computers and their effects on office work, cost, depreciation, and centralization.

1.30 National Bureau of Economic Research. Productivity Trends in the United States, by John W. Kendrick (Princeton, Princeton University Press, 1961). 630 pp.

Concept and meaning of productivity changes and methodology whereby it can be measured. Estimates of productivity in the U.S. economy and major industrial sectors over an extended time period. Impact of economic aggregates and structure.

1.31 New York. Governor's Conference on Automation; Proceedings, June 1-3, 1960, Cooperstown, N.Y. (Albany, 1960). 144 pp.

Address on accelerated economic growth by Gov. Nelson A. Rockefeller and papers by John T. Dunlop, John Diebold, Eli Ginzberg, and Solomon Barkin. Impact on communities, skills, wages, labor relations, maintenance, management organization, government, employment, education, and training. Consequences for New York State and distressed labor markets. Guidelines for private and public policies.

1.32 Phillips, Almarin. Automation; Its Impact on Economic Growth and Stability (Washington, American Enterprise Association, 1957). 36 pp.

Impact of automation and implications for national policy. Magnitude of potential economic growth based on continued technological progress and possible effects on population, occupational composition, productivity, exports, skills, and gross national product. Problems of business cycles and periodic unemployment.

1.33 Pollock, Frederick. Automation, A Study of Its Economic and Social Consequences. Translated by W. O. Henderson and W. H. Chaloner (New York, Praeger, 1957). 276 pp.

Survey of automation's rapid development, problems raised by its introduction (e.g., threat of unemployment) and factors influencing economic and social aspects, based mainly on developments in the United States. Influence on concentration of economic power, composition of the labor force, management's role, economic stability, and threat of a totalitarian society.

1.34 Pyke, Magnus. Automation: Its Purpose & Future (New York, Philosophical Library, 1957). 191 pp.

Implications for industrial work. Trends in computer technology, engineering, chemistry, accounting, petroleum, and transport industries, retailing, food and catering, translation, and missiles.

1.35 Religion and Labor Foundation. The Impact of Automation (Columbus, Ohio, 1957). 32 pp.

Addresses to a conference. "Impact on ethics and culture," by Margaret Mead, covers world implications, attitudes, education, training, mobility, accuracy, and skills. "Impact on production and employment," by James B. Carey, includes effects on cost, collective bargaining, job content, leisure, productivity, occupational structure, depressed areas, and education.

1.36 Rogers, Jack. Automation; Technology's New Face (Berkeley, Institute of Industrial Relations, University of California, 1958). 94 pp.

Concept and examples in processing and metalworking industries and office work. Implications for employment, standard of living, unemployment, wages, hours, working conditions, job content, and management.

1.37 "Sharing the Benefits of Productivity," International Labour Review, July 1960, pp. 1-25.

Beneficiaries of more output or more leisure and economic consequences: lower prices, higher wages, higher employer income, and shorter hours of work.

1.38 "Social Consequences of Automation," International Social Science Bulletin, Vol. 10, No. 1, 1958, whole issue.

Papers by nine experts on effects on employment structure, industrial relations, and management; also, on translating machines, problems in the USSR, international organizations, and research into social effects.

1.39 Steele, George and Kircher, Paul. The Crisis We Face: Automation and the Cold War (New York, McGraw-Hill, 1960). 220 pp.

Military and economic necessity for substantial advances in automation to improve productive efficiency and weapon control. Technical problems and those of management, organization, and design.

1.40 U.S. Congress, Joint Economic Committee. Automation and Recent Trends; Hearings, Subcommittee on Economic Stabilization, 85th Cong., 1st sess., November 14 and 15, 1957 (Washington, U.S. Government Printing Office, 1957). 100 pp.

Statements by a research scientist and a publisher on general trends, outlook, and need for automation; by banking officials, on reasons for bank automation; and by a labor leader, on implications in retail trade.

1.41 U.S. Congress, Joint Economic Committee. Automation and Technological Change; Hearings, Subcommittee on Economic Stabilization, 84th Cong., 1st sess. (Washington, U.S. Government Printing Office, 1955). Summarized by Edgar Weinberg in Monthly Labor Review, January 1956, pp. 7-14.

Statements by 27 leaders in business, labor, Government, economic and scientific research. Nature and implications of automation, in metalworking, data processing, chemical, electronics, and communication fields. Extent of displacement, training and retraining, distribution of productivity gains, and proposed policies.

1.42 U.S. Congress, Joint Economic Committee. Instrumentation and Automation; Hearings, Subcommittee on Economic Stabilization, 84th Cong., 2d sess., December 12, 13, and 14, 1956 (Washington, U.S. Government Printing Office, 1957). 202 pp.

Statements by 14 businessmen, scientists, educators, and Government and labor officials on developments and implications in petroleum, aeronautics, instruments, nucleonics and the economy. Effects on investment, education, training, and skill development.

1.43 U.S. Congress, Joint Economic Committee. New Views on Automation; Papers submitted to the Subcommittee on Automation and Energy Resources, 86th Cong., 2d sess. (Washington, U.S. Government Printing Office, 1960). 604 pp.

Statements by 38 leaders in business, labor, Government and universities on trends, outlook, and implications in various industries and sectors: chemicals, electronics, automobile, telephone, railroad, petroleum, metalworking, electrical machinery, retail trade, and office work. Policy proposals.

1.44 U.S. Department of Labor, Bureau of Labor Statistics. Impact of Automation, BLS Bull. 1287 (Washington, U.S. Government Printing Office, 1960). 114 pp.

Collection of 20 articles from Monthly Labor Review based on studies, reports, and speeches by researchers and officials in Government, labor, management, and universities. Includes reports of general surveys and BLS case studies, and discussion of the implications for industrial relations.

1.45 Watson, Thomas J., Jr. "Technological Change," Goals for Americans, Report of the President's Commission on National Goals (Englewood Cliffs, N.J., Prentice-Hall, 1960), pp. 193-204.

Recommends encouragement of technological change because of its use in improving men's lives, and sharing technological knowledge. Statement on implications for workers and policies recommended to ease impact through planning, collective bargaining, and Government participation.

1.46 Wiener, Norbert. "Man and the Machine," Challenge, June 1959, pp. 36-41.

Implications of automation for displacement, planning and government regulation. Potential capabilities of machines and problems of operations. Questions and answers.

1.47 Wiener, Norbert. "Some Moral and Technical Consequences of Automation," Science, May 6, 1960, pp. 11-15.

Strategies developed by game playing machines.

SECTION 2 - TECHNOLOGICAL CHANGES IN SOME LEADING INDUSTRIES

This section includes references describing important technical innovations in key industries. Surveys of technical trends are annotated. Industry references are annotated only when titles do not indicate the contents.

SURVEYS OF BROAD TECHNOLOGICAL TRENDS

2.001 American Management Association. Toward the Factory of the Future, Special Report No. 28 (New York, 1957). 96 pp.

Reviews new dimensions in industry, such as electronics and atomic energy. A case study of important innovations in the machine tool industry and 12 papers on impact of automation on maintenance, materials handling, transportation, purchasing, and manpower utilization.

2.002 Armour Research Foundation. Automation, A Conference for Executives; Proceedings, 1st Automation Conference, February 14 and 15, 1956 (Chicago, Illinois Institute of Technology, 1956). 116 pp.

Papers by 11 engineers, scientists, and industrial specialists. Motives, benefits, and implications of automation for labor, management, and operations research. Examples in the watchmaking and oil industries. Technical case studies in check processing, electronic component assembly, automotive wheel welding, and cam milling machine control. Instrumentation, control, and engineering tools.

2.003 Bello, Francis. "The 1960's: a Forecast of the Technology," Fortune, January 1959, pp. 74-78 ff.

2.004 Bright, James R. "Are We Falling Behind in Mechanization?" Harvard Business Review, November/December, 1960, pp. 93-106.

Examples of U.S. production leadership challenged by foreign advances. Summary of trends in work feeding and removal, materials handling, inspection and testing, assembly, factory communications, containers, warehousing, machine program and feedback control, compounding of equipment, and integration of data processing with production machinery. Implications (qualitative and quantitative) for labor, training, maintenance, cost, investment, and flexibility.

2.005 Bright, James R. "Progress and Payoff in Industrial Automation," Dun's Review of Modern Industry, January 1960, pp. 44-46 ff.

Benefits, disadvantages, and operating characteristics of automatic plants. Trends in mechanization of work feeding and removal, materials handling, assembly, inspection, distribution, testing, packaging, data processing, maintenance, communications, feedback and program controls, setup operations and integration of production and data processing.

2.006 Fortune editors. Markets of the Sixties (New York, Harper, 1960). 266 pp.

Twelve articles from Fortune on potential developments in the framework of consumer markets, technology, productivity, and income distribution during the 1960's.

2.007 Goodman, L. Landon. Automation Today and Tomorrow (London, Oxford University Press, 1958). 275 pp.

Survey of trends and new methods in 14 industries in computer control, instrumentation, processing, assembly, finishing, inspection, and testing. Implications for planning, manpower, research, sales and distribution, packaging, warehousing, and building design. Annotated bibliography (158 pp.) on 20 industries, management theory and techniques, labor, economic and social implications.

2.008 Grabbe, Eugene Munter, editor. Automation in Business and Industry (New York, Wiley, 1957). 611 pp.

Technical lectures by engineers and scientists on fundamentals of automation, new techniques, and system application. Integration of feedback control, instrumentation, analog and digital computation, and data processing. Application on broad scale to control systems.

2.009 Great Britain, Department of Scientific and Industrial Research. Automation in North America. Overseas Technical Reports, No. 3 (London, Her Majesty's Stationery Office, 1958). 66 pp.

Technical report by British engineer, S. B. Bailey, on visits to United States and Canadian plants in selected industries. Covers aircraft and engines, motor vehicles and accessories, distribution, electronics, general engineering, household appliances, instruments and control equipment, machine tools and control systems, meat processing, pipefittings, plywood, and steel.

2.010 Great Britain, Department of Scientific and Industrial Research. Automation in Perspective. The D.S.I.R. report on automation in brief (London, Her Majesty's Stationery Office, 1956). 28 pp.

A review of developments and potential. Implications for management organization, techniques, and structure, employment, skills, work satisfaction, and pay.

2.011 Hawley, George F. Automating the Manufacturing Process (New York, Reinhold Publishing Corp., 1959). 147 pp.

2.012 "Industrial Automatic Systems: Progress and Payout," Control Engineering, September 1960, whole issue.

Articles and reports of 17 case studies on automatic business controls and process systems, and applications of automation in unit operations, evaluation, and materials handling, and in metalworking.

2.013 Rusinoff, Samuel Eugene. Automation in Practice (Chicago, American Technical Society, 1957). 261 pp.

2.014 Santesmases, J. Garcia. "A Few Aspects of the Impact of Automation on Society," Impact of Science on Society, Vol. 9, No. 2, 1961, pp. 107-126.

Development of feedback systems, electronic computers, and digital techniques in data transmission and interpretation, application to machine tools, and maximizing utilization. Economic and social aspects. Automation in less developed countries.

2.015 Schurr, Sam H., Netschert, Bruce C., and others. Energy in the American Economy, 1850-1975, Its History and Prospects. Published for Resources for the Future, Inc. (Baltimore, Johns Hopkins Press, 1960). 774 pp.

Century of energy history. Estimated future demand and supply of energy, by sectors and activities.

2.016 Siegel, Irving H. "Technology and Population as Factors in the Long-Term Outlook," Proceedings of the Business and Economic Statistics Section (Washington, D.C., American Statistical Association, 1957), pp. 163-166.

2.017 Soule, George. The Shape of Tomorrow (New York, New American Library, 1958). 141 pp.

Summary of technical progress and prospects for machinery, energy, new materials, farming, transportation, housing, food and consumer goods, medicine, and health. Outlook for income, work, leisure time, water supply, and living standards.

2.018 "Survey Report and Automation Forecast," Automation, January 1959, pp. 17-23.

Survey of trends and plans for automating manufacturing facilities in food, tobacco, textiles, apparel, lumber, furniture, paper, printing, chemicals, petroleum and coal, rubber, leather, stone, clay and glass, metals, machinery, transportation, instruments, engineering, and architecture.

2.019 U.S. Atomic Energy Commission. Radioisotopes in Science and Industry (Washington, U.S. Government Printing Office, January 1960). 176 pp.

2.020 U.S. Congress, Joint Economic Committee. Energy Resources and Technology; Hearings, Subcommittee on Automation and Energy Resources, 86th Cong., 1st sess., October 12, 13, 14, and 15, 1959 (Washington, U.S. Government Printing Office, 1959). 352 pp.

Statements by 19 experts from Government, business, and research organizations. Impact of technology on production, cost, and use of energy. Prospective needs and cost relationships among conventional sources--coal, water, oil, and natural gas. Outlook for cost-reducing techniques, and nuclear and solar power.

2.021 U.S. Department of the Interior, Bureau of Mines. Energy Production and Consumption in the United States: an Analytical Study Based on 1954 Data, by Perry D. Teitelbaum. Report of investigations 5821. Based on work done in cooperation with Resources of the Future, Inc. (Washington, 1961). 145 pp.

Structure of the U.S. energy economy and relationship of various fuels and electric energy to each other.

2.022 Vannah, William E. "Control Enters a New Decade." Control Engineering, January 1960, pp. 101-107.

Forecast of scope, form, and direction of automation control systems.

2.023 Weidenbaum, M. L. "The Military Research and Development Market," Journal of Marketing, April 1961, pp. 38-41.

AGRICULTURE

2.024 Street, James H. "Mechanizing the Cotton Harvest," Smithsonian Report, 1957 (Washington, Smithsonian Institution, 1958), pp. 413-427.

2.025 U.S. Department of Agriculture, Agricultural Research Service. Changes in Farm Production and Efficiency, A Summary Report, (1910-59). Statistical Bull. 233 (Washington, revised July 1960). 48 pp.

2.026 U.S. Department of Agriculture. Power to Produce: The Yearbook of Agriculture, 1960 (Washington, U.S. Government Printing Office, 1960). 480 pp.

2.027 U.S. Department of Labor, Bureau of Employment Security. Potato Harvest Mechanization: Effect on Seasonal Hired Labor, 1950-60, BES No. R-204 (Washington, August 1961). 21 pp.

AUTOMOBILES

2.028 Custer, James R., editor. Applied Automation (Philadelphia, Chilton, 1956). 236 pp.

Selected articles published during 1952-56 in Automotive Industries, on automation application in automotive and aircraft production. Examples in machining, stamping, welding, forging, heat treating, plating, painting, inspection, testing, assembling, and other operations.

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SECTION 3 - IMPACT OF INDUSTRIAL AUTOMATION

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3.21 Sheppard, Harold L. and Stern, James L. "Impact of Automation on Workers in Supplier Plants," Labor Law Journal, October 1957, pp. 714-718.

Example of an automotive supply plant shutdown due to automation and mergers in the industry. Reemployment problems of older workers, women, and Negroes. Duration of unemployment and exhaustion of unemployment benefits.

3.22 U.S. Department of Labor. Bureau of Labor Statistics. A Case Study of A Company Manufacturing Electronic Equipment (Washington, 1956). 19 pp. Summarized in Monthly Labor Review, January 1956, pp. 15-19.

Effects of the introduction of automatic production methods, at a company manufacturing electronic equipment, on employment, productivity, and working conditions. Outlines some problems and methods of adjustment adopted by management and labor.

3.23 U.S. Department of Labor, Bureau of Labor Statistics. Studies of Automatic Technology: A Case Study of a Large Mechanized Bakery, BLS Report 109 (Washington, 1957). 26 pp. Summarized by Herman J. Rothberg in Monthly Labor Review, September 1956, pp. 1037-1040.

Effects of the introduction of more automatic production methods at a large perishable goods bakery on employment, productivity, working conditions, displacement, job content, transfers, and skills.

3.24 U.S. Department of Labor, Bureau of Labor Statistics. Studies of Automatic Technology: A Case Study of A Modernized Petroleum Refinery, BLS Report 120 (Washington, 1957). 44 pp. Summarized by Herman J. Rothberg in Monthly Labor Review, September 1957, pp. 1083-1087.

Effects of technological change during 1948-56 in a medium-size oil refinery on employment, working conditions, occupational requirements, industrial relations, labor relations, and other labor problems. Also trends and impact on the industry.

3.25 U.S. Department of Labor, Bureau of Labor Statistics. Impact on Workers and Community of a Plant Shutdown in a Depressed Area, Bull. 1264 (Washington, U.S. Government Printing Office, 1960). 58 pp. Summarized by Richard C. Wilcock in Monthly Labor Review, September 1957, pp. 1047-1052.

Characteristics and employment experience of displaced workers after railroad equipment plant shutdown. Factors in deciding where to live and work. Community problems. Earnings and attitudes of the reemployed.

3.26 U.S. Department of Labor, Bureau of Labor Statistics. Technological Change and Productivity in the Bituminous Coal Industry, 1920-60, BLS Bull. 1305 (Washington, U.S. Government Printing Office, 1961). 140 pp. Summarized by Robert T. Adams in Monthly Labor Review, October 1961, pp. 1081-1086.

Recent trends in technology and output per man-hour. Implications for employment, unemployment, wages, prices, and profits. Text supplemented by charts and supporting tables.

3.27 Walker, Charles R. "Life in the Automatic Factory," Harvard Business Review, January/February 1958, pp. 111-119.

Impact of automatic technology on job content, skills, working conditions, workers' attitudes, human relationships, pay, method of payment, training, and education. Based on field research at a semi-automatic mill.

3.28 Walker, Charles R. Toward the Automatic Factory: A Case Study of Men and Machines (New Haven, Yale University Press, 1957). 232 pp.

Psychological and social effects of technological change on steelworkers and crews during the breaking in of the first continuous seamless pipe mill. Effects on supervision, job satisfaction, pay and incentives, working conditions, and promotions. Implications for management and labor and adjustment of human nature to technological civilization.

SECTION 4 - IMPACT OF OFFICE AUTOMATION

This section contains case studies and larger surveys into the effects of and adjustment to the introduction of electronic data processing systems in offices in private industry and government.

4.01 American Management Association. Gaining Acceptance for Major Methods Changes, by Ben Miller, AMA Research Study 44 (New York, 1960). 63 pp.

Comparison of attitudes and reaction of management and worker groups in six large companies to the introduction of electronic or punched card data-processing machines. Case studies of installation procedures in a paper, telephone, and drug company, two banks, and a public utility. Examination of some prevalent assumptions and of factors engendering resistance to change.

4.02 Bell, James R. and Steedman, Lynwood B. Personnel Problems in Converting to Automation, The Inter-University Case Program, 44 (University of Alabama Press, 1960). 14 pp.

Case study of the introduction of electronic computers into California Department of Employment. Factors in management decision and plans for introduction. Personnel planning and impact. Conversion problems. Training programmers and operators, transfer, and retraining.

4.03 Controllers Institute Research Foundation, Inc. Business Experience With Electronic Computers (New York, 1959). 191 pp.

Examples of ideas, approaches, and techniques from 17 large companies. Factors in arriving at a decision as to size and scope of an electronics program. Preparing for, introducing, and operating electronic equipment. Developing applications and conversion. Relations with the manufacturer.

4.04 Ginder, Charles E. Why Automation? (Willow Grove, Pa., National Office Management Association, 1959). 7 pp.

Findings of a survey by NOMA. Company experience with electronic and integrated data processing. Installations by size, type of business, and application. Job losses, transfers, and integration of affected personnel. Annotated bibliography.

4.05 Haddy, Pamela. "Some Thoughts on Automation in a British Office," Journal of Industrial Economics, February 1958, pp. 161-170.

Case study reconstructs some aspects of the decision by J. Lyons & Co. (England) to automate some clerical operations. Factors leading to the decision, tasks performed by the computer, and labor employed.

4.06 Hardin, Einar. "Computer Automation, Work Environment, and Employee Satisfaction: A Case Study," Industrial and Labor Relations Review, July 1960, pp. 559-567.

Introduction of a medium-size computer into operations of an insurance company. Changes in various job aspects, worker attitudes to changes, and job satisfaction, compared in computer-affected departments with departments affected by other types of changes occurring simultaneously.

4.07 Hardin, Einar. "The Reactions of Employees to Office Automation," Monthly Labor Review, September 1960, pp. 925-932.

Characteristics of changes in work environment caused by the installation of a medium-size computer in an insurance company. Impact on work and job content. Comparison of worker attitudes and job satisfaction of affected and unaffected employees in experiences with changes.

4.08 Hoos, Ida Russakoff. Automation in the Office (Washington, Public Affairs Press, 1961). 138 pp.

Effects of automation on office workers as individuals and groups. Scope, rate, and extent of introduction. Implications for occupational structure, employment, skills, new job opportunities, upgrading and downgrading, job content, and organizational structure. Role and responsibilities of management, labor, and government. Based on empirical field research in numerous business and government offices.

4.09 Hoos, Ida Russakoff. "The Impact of Office Automation on Workers," International Labour Review, October 1960, pp. 363-388.

Summary of part of a study on effects in 20 organizations (banking, railroads, insurance, utilities and government agencies) in the San Francisco area. Impact on workers, work groups, organization, jobs, supervisors, older workers, and transferred workers. Organized labor's efforts to mitigate effects.

4.10 Hoos, Ida Russakoff. "When the Computer Takes Over the Office," Harvard Business Review, July/August 1960, pp. 102-112.

Impact of electronic data processing on management organization, advanced planning, outlook, and on office workers, specific jobs, displacement, upgrading, job satisfaction, and transfers.

4.11 Jacobson, Eugene, and others. "Employee Attitudes Toward Technological Change in a Medium-Sized Insurance Company," Journal of Applied Psychology, December 1959, pp. 349-353.

Report on Michigan State University case study. Discusses non-supervisory employees' general attitude toward technical change and perception of impact of machines on the office situation and jobs.

4.12 Mann, Floyd C. and Williams, Lawrence K. "Observations on the Dynamics of a Change to Electronic Data-Processing Equipment," Administrative Science Quarterly, September 1960, pp. 217-266.

Presents findings from a longitudinal case study of effects of the introduction of EDP in a light and power company. General management problems of introducing change and effects on organizational structure, policies, philosophy, job structure, and personnel at all levels. Discusses reassignment of workers and other transitional problems.

4.13 Mann, Floyd C. and Williams, Lawrence K. "Organizational Impact of White-Collar Automation," Industrial Relations Research Association Proceedings, 1958, pp. 59-69.

Effects of electronic data processing on industrial relations, organization, and personnel; problems of changeover and managing data systems; changes in management philosophy, organizational structure, and job content. Based on case studies.

4.14 "National Survey of Computer Department Salaries," Management and Business Automation, June 1960, pp. 1-7.

Thirty-five computer jobs analyzed for salary, responsibilities, and job content.

4.15 Riche, Richard W. and Alli, William E. "Office Automation in the Federal Government," Monthly Labor Review, September 1960, pp. 933-938.

Computer applications and savings, problems of displacement and reassignment, personnel planning for technological change, selecting and training personnel for electronic data-processing positions, and attitudes of employee organizations. Based on hearings before the Subcommittee on Census and Government Statistics of the House of Representatives, Committee on Post Office and Civil Service.

4.16 Southern California, University of, Department of Psychology. The Role of Humans in Complex Computer systems: A Description of the Study, Programming, and Maintenance, Technical Reports Nos. 24, 25, and 26 (Los Angeles, 1959). 226 pp.

Psychological issues in the programming and maintenance of digital computers, as indicated in interviews. Report 24 describes methodological aspects of the research, with a glossary; Report 25, practices and problems of programming, programmers, and the implementations of large integrated data-processing systems; Report 26, problems and issues of maintenance and the selection, training, and supervision of maintenance technicians. Future trends.

4.17 Stieber, Jack. "Automation and the White-Collar Worker," Personnel, November/December 1957, pp. 8-17. Reprinted by Michigan State University, Labor and Industrial Relations Center, 1957-58 reprint series, East Lansing.

Case studies illustrate implications of extended use of computers for employment, displacement, transfers, skill and job changes, occupational distribution, employee attitudes, white-collar unionization, and management.

4.18 U.S. Congress, House of Representatives, Committee on Post Office and Civil Service. Office Automation and Employee Job Security; Hearings, Subcommittee on Census and Government Statistics, 86th Cong., 2d sess., March 2 and 4, 1960 (Washington, U.S. Government Printing Office, 1960). 84 pp. Summarized by Richard W. Riche and William E. Alli in Monthly Labor Review, September 1960, pp. 933-938.

Introduction of computer operations in Veterans Administration and Department of the Treasury. Resultant economies and impact on employees. Statements by union leaders on their policies and recommendations on technological change.

4.19 U.S. Congress, House of Representatives, Committee on Post Office and Civil Service. Use of Electronic Data-Processing Equipment; Hearings, Subcommittee on Census and Government Statistics, 86th Cong., 1st sess., June 5, 1959 (Washington, U.S. Government Printing Office, 1959). 142 pp. Summarized by Richard W. Riche and William E. Alli in Monthly Labor Review, September 1960, pp. 933-938.

Extent and uses of electronic data-processing equipment in Federal agencies. Includes testimony on Budget Bureau and General Accounting Office experiences. Findings of a study of personnel problems related to adopting and using EDP systems.

4.20 U.S. Department of Labor, Bureau of Labor Statistics. Adjustments to the Introduction of Office Automation, Bull. 1276 (Washington, U.S. Government Printing Office, 1960). 86 pp. Summarized by Edgar Weinberg in Monthly Labor Review, April 1960, pp. 376-380.

A study of some implications of the installation of electronic data processing in 20 offices in private industry, with special reference to older workers. Practices of each office in reassigning, selecting, and training employees. Statistical data on extent of displacement, transfer, upgrading, and downgrading. Objectives and results of changes, ages, occupational characteristics of displaced workers and those assigned new jobs. Aptitudes required on new jobs. Implications for older workers.

4.21 U.S. Department of Labor, Bureau of Labor Statistics. Studies of Automatic Technology: A Case Study of an Automatic Airline Reservation System, BLS Report 137 (1959). 21 pp. Summarized by Edward B. Jakubauskas in the Monthly Labor Review, September 1958, pp. 1014-1016.

Introduction of electronic data-processing system in an airline office and implications for employment, job and occupational requirements, and industrial relations. Developments and impact on the industry.

4.22 U.S. Department of Labor, Bureau of Labor Statistics. The Introduction of an Electronic Computer in a Large Insurance Company (Washington, October 1955). 18 pp.

Nature of the innovation of the computer and impact on employment, productivity, and working conditions. Outlines management planning to prevent layoffs and cushion worker adjustment. Based on field study.

4.23 Weber, C. Edward. "Change in Managerial Manpower with Mechanization of Data Processing," Journal of Business, April 1959, pp. 151-163.

Manpower changes which accompanied electronic data-processing applications in a job-shop fabricating company and a basic steel works. Relative rise in administrative and professional employment and association of increase with efforts to change operations, relation between technological development and bureaucratization. Based on field interviews.

4.24 Weber, C. Edward. "Impact of Electronic Data Processing on Clerical Skills," Personnel Administration, January/February 1959, pp. 20-26.

Experience of a metal fabricating firm and a basic steel works with electronic computers for inventory control and cost accounting. Effects on occupational composition, clerical skills, and job structure.

SECTION 5 - IMPLICATIONS FOR EMPLOYMENT, UNEMPLOYMENT, AND MANPOWER TRENDS

This section includes references on automation's implications for employment, unemployment, displacement, productivity, manpower trends and outlook, and leisure time.

5.01 Acton Society Trust. Redundancy: A Survey of Problems and Practices (London, 1958). 56 pp.

Effects of automation on displacement. Policies to reduce economic and human cost. British Government programs.

5.02 "Adapting Farm Labor Services to Changing Time," Employment Security Review, January 1961, whole issue.

Problems of increasing mechanization on farms and how government employment services are helping agricultural workers to adjust. Implications for migrant workers. Examples in various types of farming throughout United States.

5.03 "Automation and Jobs," Steel, September 4, 1961, pp. 53-92.

A collection of articles on implications for employment, causes of unemployment, creation of new jobs, and ways to sell benefits of automation to employees. Role and responsibilities of management, unions, and Government.

5.04 "The Automation and Unemployment Problem: How Big Is It?" Factory, September 1961, pp. 79-83.

Reports survey findings on displacement prospects in 500 plants. Management attitudes.

5.05 Barkin, Solomon. "Automation and the Community," Governor's Conference on Automation; Proceedings, June 1-3, 1960, Cooperstown, N.Y. (Albany, 1960), pp. 93-128. Reprinted by Textile Workers Union of America, Research Publication No. E-101A, New York.

Problems of adaptation faced by communities adversely affected by technological change. Need for social policies, agencies, and programs to promote economic development of distressed communities.

5.06 Bogardus, Emory S. "Social Aspects of Automation," Sociology and Social Research, May/June 1958, pp. 358-363.

Implications for office and factory workers, leisure, education, and social change.

5.07 Chamber of Commerce of the United States, Economic Research Department. Automation and Unemployment (Washington, 1961). 34 pp.

Analysis of labor-displacing effects of automation, structural unemployment, unemployables, and depressed areas. Other types of unemployment and measures to cope with it through unemployment compensation, providing income security, improved labor mobility, training and retraining, flow of information, and economic growth.

5.08 Chamber of Commerce of the United States. Employment and Unemployment: The Problem of the 1960's; Proceedings, 2d 1961 Economic Institute, May 17, 1961 (Washington, 1961). 100 pp.

Papers by Clarence D. Long, Yale Brozen, Neil W. Chamberlain, and Robert J. Myers on unemployment propsects of the 1960's, causes of unemployment, problems and correctives, and measurement of employment and unemployment. Panel discussion by Burton N. Behling, Peter Henle, and George Terbough.

5.09 Clague, Ewan. "Automation and Youth in the 1960's," The American Child, March 1960, pp. 1-4.

Technical, economic, and social factors emphasize needs of youth for education, vocational guidance, and realistic information concerning job trends.

5.10 Clague, Ewan. "The Interest of the Federal Government in Automation," Automation Systems; Proceedings, 2d Electronic Industries Association Conference (New York, Engineering Publishers, 1958), pp. 151-158. Mimeographed by U.S. Department of Labor, Bureau of Labor Statistics, 1958. 13 pp.

Automation as a useful technique of production in business-type activities. Implications for productivity, displacement, skills, occupations, training. Management planning for personnel adjustment.

5.11 Clague, Ewan. "Social and Economic Aspects of Automation," Labor Law Journal, September 1961, pp. 795-810. Mimeographed by U.S. Department of Labor, Bureau of Labor Statistics, Washington, 1961. 30 pp. Excerpted in Monthly Labor Review, September 1961, pp. 957-960.

Measures of technological change and labor implications for the economy, specific firms, and industries. Effects on employment, unemployment, and occupational structure. Examples of company and industrywide labor-management responses to automation in meatpacking, steel, coal, and longshoring. Government activities in automation and manpower and responsibilities of engineers.

5.12 Dankert, Clyde E. "Automation and Unemployment," Studies in Unemployment. U.S. Senate, Special Committee on Unemployment Problems, 86th Cong., 2d sess. (Washington, U.S. Government Printing Office, 1960), pp. 225-250.

Concept of automation and effects feared. Definitions and characteristics of technological unemployment and policy suggestions for coping with it. Impact of technological change on employment.

5.13 Denise, Malcolm L. "Statement before the Subcommittee on Unemployment and the Impact of Automation," Impact of Automation on Employment; Hearings, U.S. House of Representatives, Committee on Education and Labor, 87th Cong., 1st sess., April 17, 1961 (Washington, U.S. Government Printing Office, 1961), pp. 509-574.

Describes Ford Motor Co. programs to minimize and alleviate unemployment through shorter model change time, supplemental unemployment benefits, training and retraining, application of seniority in job preference, transfers, retirement plans, and separation payments. Examples of specific applications of programs and policies.

5.14 Dymond, W.R. Technological Changes and Their Impact on Employment, Occupations, and Industrial Relations. Address to McGill Industrial Relations Conference, Toronto, June 6, 1961. Reprinted by Canadian Department of Labor, Economics and Research Branch, Ottawa.

Discusses findings of Canadian research on implications of technological changes for employment, production, occupational composition, skill requirements, training, and retraining.

5.15 Farrar, L.D. "Kennedy's Automation Doctor," Administrative Management, June 1961, pp. 13-16.

Seymour L. Wolfbein, director of U.S. Department of Labor's Office of Automation and Manpower, reviews his assigned duties as Government adviser and plans for meeting problems arising from automation.

5.16 Faunce, William A. "Automation and Leisure," Automation and Society, H.B. Jacobson and J.S. Roucek, editors (New York, Philosophical Library, 1959), pp. 297-308. Reprinted by Michigan State University, Labor and Industrial Relations Center, 1959-60 reprint series, East Lansing, 1959.

Effect of automation on amount of available leisure time, leisure use patterns, and American culture patterns.

5.17 Fernstrom, John R. "Community Attack Upon Chronic Unemployment - Hazleton, Pa.: A Case Study," Studies in Unemployment, U.S. Senate, Special Committee on Unemployment Problems, 86th Cong., 2d sess. (Washington, U.S. Government Printing Office, 1960), pp. 367-409.

Community efforts to retain local industries, provide new jobs, and encourage new industry location.

5.18 Ginzberg, Eli. "Automation and Manpower," Governor's Conference on Automation; Proceedings, June 1-3, 1960, Cooperstown, N.Y. (Albany, 1960), pp. 86-92.

Significance of current technical changes. Effect on level of employment, labor force, education and training. Policy recommendations for State governments.

5.19 Ginzberg, Eli. "Machines vs. Men?" Challenge, June 1961, pp. 26-29.

Manpower trends and sources of future workers. Implications for unemployment, employment, education, retraining, and government policy.

5.20 Goldberg, Arthur J. "Statement before the Subcommittee on Unemployment and the Impact of Automation," Impact of Automation on Employment; Hearings, U.S. House of Representatives, Committee on Education and Labor, 87th Cong., 1st sess., April 25, 1961 (Washington, U.S. Government Printing Office, 1961), pp. 651-677.

Examples of unemployment under the impact of technological changes and productivity gains. Special problems of youth, older workers, unskilled workers, and those in depressed areas. Programs and policies recommended for labor, management, and governments to alleviate unemployment.

5.21 Goldberg, Arthur J. "What Can Be Done About Unemployment? " The Saturday Evening Post, April 29, 1961, pp. 15 ff.

Causes and kinds of unemployment. Impact of structural unemployment upon communities and people. Effects of automation in manufacturing. Government and private programs and proposals to alleviate unemployment and cushion the effects of automation.

5.22 Haber, William, and others. Maintenance of Way Employment on U.S. Railroads: An Analysis of the Sources of Instability and Remedial Measures (Detroit, Brotherhood of Maintenance of Way Employees, 1957). 237 pp.

Analysis of technological displacement and employment instability by four economists.

5.23 Hansen, Alvin H. "Automation and the Welfare State," The New Republic, April 10, 1961, pp. 10-11.

Technological progress and structural unemployment. Decline in production workers, increase in service employment and implications for education and welfare.

5.24 Heckscher, August. "The New Leisure," The Nation's Children 1: The Family and Social Change, Eli Ginzberg, editor. Published for Golden Anniversary White House Conference on Children and Youth (New York, Columbia University Press, 1960), pp. 227-247.

Impact on youth. Teenager leisure and consumption. The role of work.

5.25 Henderson, John P. Changes in the Industrial Distribution of Employment, 1919-59, Bull. 87 (Champaign, Ill., University of Illinois, Bureau of Economic and Business Research, 1961). 104 pp.

Examines long-range shifts in employment from agriculture to manufacturing, and from manufacturing to the service industries, using annual statistical series. Also examines productivity effects of interindustry employment shifts and problems of unemployment.

5.26 "The Impact of Automation--A Challenge to America," The American Federationist, August 1961, pp. 12-19.

Federal responsibility for economic planning, technological surveys, and continuing review. Cooperative programs proposed for training, retraining, employment service improvement, distressed areas, and older workers. Examples of useful negotiated adjustment procedures in the railroad, meatpacking, longshore, and other industries.

5.27 International Labor Office. Effects of Mechanisation and Automation in Offices, Report No. 3, ILO Advisory Committee on Salaried Employees and Professional Workers, 5th sess., Cologne, 1959 (Geneva, 1959). 121 pp.

Characteristics, introduction, and spread of office automation. Effects on employment, job and skill requirements, training and retraining, older workers, occupational structure, working conditions, health and morale, and labor-management relations.

5.28 International Labor Office. Effects of Technological Developments on Wages and on Conditions and Level of Employment in the Textile Industry. Report No. 3, ILO Textiles Committee, 6th sess. (Geneva, 1959). 166 pp.

Scope of technical developments, and effects on wages, wage structure, income security, hours of work, shift work, training and other working conditions, levels of employment, and work force composition. Problems of reabsorbing displaced workers.

5.29 Kahn, Herbert L. "Automation and Employment," Labor Law Journal, November 1959, pp. 796-805.

Concept and examples of automation. Effects on employment, productivity, skills, displacement, and policy proposals.

5.30 Kerr, Clark. "The Prospect for Wages and Hours in 1975," U.S. Industrial Relations: The Next Twenty Years, Jack Stieber, editor (East Lansing, Mich., Michigan State University Press, 1958), pp. 169-194.

Outlook for leisure, wage structure, skills, income, and productivity.

5.31 Killingsworth, Charles C. "Automation in Manufacturing," Industrial Relations Research Association Proceedings, 1958, pp. 19-34.

Concept and definition. Effects on employment, job requirements and occupational structure, and labor-management relations.

5.32 Killingsworth, Charles C. Effects of Automation on Employment and Manpower Planning, "Statement before the Subcommittee on Employment and Manpower of the Senate Committee on Labor and Public Welfare," June 14 and 15, 1960. Reprinted by Michigan State University, Labor and Industrial Relations Center, 1960-61 reprint series No. 37, East Lansing. 9 pp. Also in The Nation, December 17, 1960, pp. 467-470, and The American Federationist, January 1961, pp. 20-23.

Concept of automation, rate of introduction and labor displacement, skill changes, upgradings, and downgradings.

5.33 Lasser, David. "The Impact of Unions and Technological Change on Wage Payment Systems," West Virginia University Institute of Industrial Relations Proceedings, 9th Labor-Management Conference, 1959, pp. 15-21.

Trends in pay systems. Effects of technological changes on individual incentives, work quotas, and job evaluation.

5.34 Levitan, Sar A. "Structural Unemployment and Public Policy," Labor Law Journal, July 1961, pp. 573-582.

Rise in unemployment, extent of and trends in structural unemployment. Recommends Federal programs to reduce future impact by improved employment services, retraining facilities, labor mobility, and aid to depressed areas.

5.35 Livernash, E. Robert. "The Impact of Unions and Technological Change on Wage Payment Systems," West Virginia University Institute of Industrial Relations Proceedings, 9th Labor-Management Conference, 1959, pp. 1-14.

Trends and potential developments in wage payment systems. Influence of unions and technological change on performance of work and method of pay.

5.36 McIntyre, William R. "Automation and Jobs," Editorial Research Reports, June 3, 1959, pp. 403-420.

Impact on factory and office jobs, occupational trends, collective bargaining, and the labor movement. Means of easing impact and results of union efforts.

5.37 Meredith, Jane L. "Long-Term Unemployment in the United States," Monthly Labor Review, June 1961, pp. 601-610.

Examines sources of unemployment and characteristics of the long-term unemployed, influence of automation, and future labor force growth.

5.38 Myers, Robert J. "Social Ramifications of Automation," Pittsburgh Business Review, September 1961. Address at commencement week seminar of the University of Pittsburgh, June 9, 1961. Mimeographed by U.S. Department of Labor, Bureau of Labor Statistics, 1961. 14 pp.

Trends in productivity and examples of technological change in the coal, railroad, and steel industries. Implications for unemployment. Measures to prevent displacement and hardships and to retrain workers.

5.39 National Association of Manufacturers. Automation: A Prime Source of More and Better Jobs, Economic series, No. 81 (New York, September 1960). 12 pp.

Impact of automation on labor, employment, and investment. Implications for layoffs, transfers, labor relations, retraining, downgrading, and wages. Challenge for labor, management, and government.

5.40 Naville, P. "The Structure of Employment and Automation," International Social Science Bulletin, Vol. 10, No. 1, 1958, pp. 16-29.

Interactions of automation and employment. Factors determining quantitative changes in employment, structural changes in manpower composition, and changes in cost, value of human effort, and employee behavior.

5.41 New York, Department of Labor. Jobs, 1960-1970. The Changing Pattern; Manpower and Technological Change in New York State (Albany, 1960). 40 pp.

Implication of changing technology for the labor force, manpower needs, training needs and facilities, retraining, skills, and unemployment.

5.42 Piel, Gerard. "End of Toil; Science Offers A New World," The Nation, June 17, 1961, pp. 515-519. Same text published as Consumers of Abundance, an Occasional Paper on the Role of the Economic Order in the Free Society (Santa Barbara, Calif., Center for the Study of Democractic Institutions, June 1961). 10 pp.

Adjustments to the reduction in worktime and implications for the distribution system, employment, and social values. Increased production, leisure, and redistribution of income. Subversion of property as an institution.

5.43 Piel, Gerard. "The Revolution in Man's Labor," New York, Scientific American, 1959 . 16 pp.

Comparison of labor in ancient and contemporary economies. Revolution in science, technology, and labor, with implications. Want as a social problem. Program to increase production in undeveloped countries.

5.44 Raskin, A. H. "Hard-Core Unemployment: A Rising National Problem," and 3 other articles. New York Times, April 6-9, 1961.

Problems of chronic unemployment, how automation affects it, fears of displacement, implications for skills and retraining and other human efforts, and efforts in and outside Government to ease its impact.

5.45 Reuther, Walter P. "Statement to the Subcommittee on Automation and Energy Resources," New Views on Automation, U.S. Congress, Joint Economic Committee, 86th Cong., 2d sess. (Washington, U.S. Government Printing Office, 1960), pp. 551-583.

Implications of automation for productivity, economic growth, automobile employment and industry location, and community problems. Collective bargaining provisions to cushion impact and protect job rights. Government responsibilities and recommended policies.

5.46 Rezler, Julius. "The Impact of Automation on the Stability of Manufacturing Employment," Current Economic Comment, May 1958, pp. 55-62.

Impact on employment stability, business cycles and investment. Speed of introduction and limits to application.

5.47 Rosen, Howard. "Technicians in the Labor Force of Russia and America, Monthly Labor Review, January 1958, pp. 1-5.

Growth in importance of semiprofessional occupations in the industrial labor force and implications for their training and supply. Comparison by occupational choice, source of supply, ratio of technicians to professionals, and evaluation of technician training programs in the United States and Russia.

5.48 Ruttenberg, Stanley H. "Statement before the Subcommittee on Unemployment and the Impact of Automation," Impact of Automation on Employment; Hearings, U.S. House of Representatives, Committee on Education and Labor, 87th Cong., 1st sess., March 29, 1961 (Washington, U.S. Government Printing Office, 1961), pp. 379-403.

Federal responsibility for economic growth, technological outlook studies, training and education, employment service, depressed areas, older workers, shorter hours, and a continuing review of automation's impact. Collective bargaining responsibility of management and labor for retraining, providing financial cushions, preventing downgrading, etc. Examples of the Washington Agreement and Armour automation fund.

5.49 Smith, Georgina M. Office Automation and White Collar Employment. Institute of Management and Labor Relations, Bull. No. 6 (New Brunswick, N.J., Rutgers University, 1959). 26 pp.

Trends in office machine technology and applications to office functions. Economic rationale. Effects on white-collar employment: displaced clerks, the group not hired, and new technicians. Implications for transfers, training and retraining, skills, shift work, and unionism.

5.50 Soule, George. Time for Living (New York, Viking Press, 1955). 184 pp. Same text published under title What Automation Does to Human Beings (London, Sidgwick and Jackson, 1956). 184 pp.

Implications of technological developments for a new stage of civilization, productivity, skills, population, occupational change, work, leisure, and pursuit of happiness.

5.51 Stern, James. "A Union View of Automation," Antioch Review, Winter 1956-57, pp. 419-434.

Description of automation in an automobile plant. Effects on productivity, employment, displacement, occupational requirements, skills, and hours of work. Policies of the United Auto Workers and management.

5.52 Ture, Norman B. "New Wine for Old Bottles: The Depressed Areas," Challenge, May 1961, pp. 6-9.

Technological change as a factor creating depressed areas. Examples in the automobile and steel industries.

5.53 U.S. Civil Service Commission, Bureau of Programs and Standards. Personnel Impact of Automation in the Federal Service (Washington, U.S. Government Printing Office, 1958). 21 pp.

Nature of major technological changes. Recruiting, training, qualification and position classification standards of automatic data-processing personnel. Impact on hours of work, displacement, and employee relations.

5.54 U.S. Congress, House of Representatives. "Employment in the Dynamic American Economy--With Study Papers," Congressional Record, 87th Cong., 1st sess. (Washington, U.S. Government Printing Office, 1961). 139 pp.

Speeches by 19 Republican members of the House, incorporating background study papers. Includes effects of automation on employment and unemployment and retraining of workers. Other topics include conditions which will best afford useful employment opportunities, the role of government, business, and labor, and policies for maximum employment, production, and purchasing power.

5.55 U.S. Congress, House of Representatives, Committee on Education and Labor. Impact of Automation on Employment; Hearings, Subcommittee on Unemployment and the Impact of Automation, 87th Cong., 1st sess., March 8-April 25, 1961 (Washington, U.S. Government Printing Office, 1961). 793 pp.

Statements by 31 labor, business, university, and Government officials. Also papers, letters, and supplementary materials. Impact of automation in the textile, communications, steel, electronics, railroad, automobile, trucking, metalworking, and mining industries, and the general economy.

5.56 U.S. Congress, Senate. Report of the Special Committee on Unemployment Problems. 86th Cong., 2d sess., Report 1206 (Washington, U.S. Government Printing Office, 1960), pp. 44-55.

Automation as a factor related to unemployment. Nature of automation. Effects on agriculture, manufacturing, railroads, coal mining, and examples of labor-management attempts to anticipate automation in meatpacking and longshoring.

5.57 U.S. Department of Labor, Bureau of Employment Security. Background Information on Impact of Automation and Technological Change on Employment and Unemployment, BES No. R-206 (Washington, September 1961). 50 pp.

Summarizes materials on effects of automation and technological change on employment and unemployment. Viewpoints of management and labor, and research in universities, foundations, and government agencies are included. Prepared for use by State employment security agencies. Includes 125-item bibliography.

5.58 U.S. Department of Labor, Bureau of Employment Security. Computing Machines; Labor Market Developments. Industry Manpower Surveys, No. 98 (Washington, D.C., January 1961). 15 pp.

Trends in production, employment, and labor requirements in manufacture of computing machines. Growth and employment outlook. Recruitment problems, earnings, turnover, and major labor market areas.

5.59 U.S. Department of Labor, Bureau of Labor Statistics. Trends in Ouput per Man-Hour in the Private Economy, 1909-1958, Bull. 1249 (Washington, U.S. Government Printing Office, 1959). 47 pp. (1960 supplement available from Bureau of Labor Statistics.)

Indexes and average rates of change in output, man-hours, output per man-hour, and employment in major sectors, with explanatory notes. Analysis of trends and factors affecting changes.

5.60 Wilson, George W. "Technological Change and Unemployment," Current Economic Comment, May 1958, pp. 47-54.

An investigation of conditions under which a technological change which involves a reduction in per unit labor costs will or will not cause unemployment.

5.61 Wolfbein, Seymour L. "Automation and Unemployment," paper prepared for the President's Advisory Committee on Labor Management Policy (Mimeographed by U.S. Department of Labor, Bureau of Labor Statistics, May 1, 1961). 4 pp.

Different types and causes of unemployment. Special problems of youth, unskilled workers, older workers, Negroes, and workers in depressed areas. Courses of action in education, training, skill development, mobility, and reducing and preventing automation's impact.

5.62 Wolfbein, Seymour L. "Automation and the Labor Force," Challenge, October 1961, pp. 24-28.

Questions and answers on implications for unemployment, skills, labor mobility, and Government policies.

SECTION 6 - IMPLICATIONS FOR OCCUPATIONAL REQUIREMENTS, SKILLS, AND WORKING CONDITIONS

This section contains references to automation's implications for occupational requirements and structure, skills, job content, upgrading and downgrading, hours of work, health, and safety.

6.01 Abruzzi, Adam. "The Power of Automation; New Horizons in Labor Dignity." Automation, December 1956, pp. 38-42.

Implications of automation for the dignity of human labor, and appreciation of human skills.

6.02 Barry, John M. "The Pressure Builds for Shorter Workweeks," The American Federationist, November 1961, pp. 6-9.

Historical trend toward shorter workweek and current union demands for more leisure. Implications of technological change for shorter working hours.

6.03 Bell, Daniel. Work and Its Discontents (Boston, Beacon Press, 1956). 56 pp.

Implications of automation for concepts of work organization, content, and measurement. Industry decentralization, decline of production workers, multiple work shifts, and other social effects. (See also extract, "Living with Automation: A Look Ahead," Management Review, January 1957, pp. 75-83.)

6.04 Bendiner, Robert. "Could You Stand a Four-Day Week?" The Reporter, August 8, 1957, pp. 10-14.

Social consequences of extended leisure through reduction of the workweek, and implications for selected occupations. Advantages of the 4-month vacation versus 4-day week. Trends and opportunities in leisure activities.

6.05 Bergmann, R. H. "Moonlighting and the American Dream," The Nation, July 1, 1961, pp. 3-5.

Attitudes toward, motives for, and extent of, moonlighting in various occupations. Influence on unions and on labor-management relations.

6.06 Bloomberg, Warner, Jr. "Requiem for the Laboring Man," Harper's, June 1959, pp. 60-64.

Decline of unskilled workers and increase in leisure for factory workers.

6.07 Bright, James R. "Does Automation Raise Skill Requirements?" Harvard Business Review, July/August 1958, pp. 85-98.

A theory of the impact of automation on skill requirements. Reduced demand on worker's skill, education, and attention.

6.08 "Close Up of the Technician: Engineering Semipro?" Parts 1-4 in Machine Design, May 12, 1960, pp. 24-28; May 26, 1960, pp. 25-28; June 9, 1960, pp. 25-28; June 23, 1960, pp. 25-28. Based on Managing Technician Manpower, Technical Manpower Associates, Scarsdale, N.Y.

Definitions, types of technicians, role in engineering activities, engineer-technician ratios. Technicians' attitudes toward status, supervision, professional societies, unions, and wages. Attitudes of management on technician's role and status in industry, hiring techniques, special inducements, and on-the-job training.

6.09 "Effects of Mechanization and Automation in Offices" (I-III), International Labour Review, February 1960, pp. 154-173; March 1960, pp. 255-273; April 1960, pp. 350-369.

Developments, spread, and effects of office mechanization and automation. Characteristics of electronic data-processing systems. Effects on job and skill requirements, training and retraining, older workers, occupational structure, environment, and working conditions. Based on ILO report, see 5.27.

6.10 Fine, Sidney A. "A Reexamination of 'Transferability of Skills'," Monthly Labor Review, Pt. I, July 1957, pp. 803-810; Pt. II, August 1957, pp. 938-948.

Part I examines some difficulties about transferability. Part II draws upon U.S. Employment Service work in occupational classification research which provides criteria and guidelines in developing a systematic approach to the study of skill transferability.

6.11 Foulger, John H. "The Anticipated Effect of Automation on Industrial Medicine," Industrial Medicine and Surgery, February 1960, pp. 86-89.

Implications for worker's medical problems. Experiences in the chemical industry. Discussion of frustration, monotony, and safety.

6.12 Galbraith, John Kenneth. "The Decline of the Machine," The Liberal Hour (New York, Houghton Mifflin, 1960), pp. 28-43.

Factors of change in relative value position of human skills and intelligence compared to capital plant. Need for and ways of investing in personal development.

6.13 Ginzberg, Eli. Human Resources: the Wealth of a Nation (New York, Simon and Schuster, 1958). 183 pp.

Popular book on manpower problems and policies, based on research in human resources at Columbia University. Marginal workers, unemployment, underemployment, barriers to employment, training, and education. Nature of talent and determinants of superior performance. Changes in working hours and conditions.

6.14 Great Britain, Department of Scientific and Industrial Research. Automation and Skill, by E.R.F.W. Crossman. Problems of Progress in Industry, No. 9 (London, Her Majesty's Stationery Office, 1960). 58 pp.

Features of work and skill requirements of continuous flow production, programmed machines, and centralized remote control. Implications for maintenance work, supervision, responsibility, and social skills. Personnel problems of selection, training, and incentives.

6.15 Great Britain, Department of Scientific and Industrial Research. Ergonomics of Automation by A.T. Welford. Problems of Progress in Industry, No. 8 (London, Her Majesty's Stationery Office, 1960). 60 pp.

Reviews research relevant to problems of human operators in automated plants, with emphasis on equipment design. Considers human factors of responsibility, isolation, shift work, training, job satisfaction, and capacity for monitoring and control operations. Changes in skill and maintenance requirements.

6.16 Hayes, A. J. "Labor's Aims in Adjusting to the New Technology," Monthly Labor Review, February 1959, pp. 160-163. Excerpts from address, "Filling the Demand for Manpower," before the Conference on Labor and Science in a Changing World, AFL-CIO, Washington, January 7-8, 1959.

Impact of population growth and research and development on manpower requirements, skills, apprenticeship, training and education.

6.17 Hill, Samuel E. and Harbison, Frederick. Manpower and Innovation in American Industry (Princeton, N.J., Princeton University, Industrial Relations Section, 1959). 85 pp.

Implications of technological and organizational innovation for employment of high-talent manpower--executives, managers, engineers, and scientists. Based on interviews in 50 companies covering a wide range of manufacturing and other industries.

6.18 Janssen, Richard F. "More Companies Teach Men New Skills, Ease Impact of Automation," Wall Street Journal, August 23, 1961, pp. 1 ff.

Description of corporate retraining programs and other means used in petroleum, steel, chemical, electronics, and meatpacking firms to ease impact of automation. Performance of retrained workers, job satisfaction, problems of older workers, union-management relations, and costs.

6.19 Karsh, Bernard. "The Meaning of Work in an Age of Automation," Current Economic Comment, August 1957, pp. 3-13. Reprinted by the Institute of Labor and Industrial Relations, University of Illinois, reprint series No. 52, Champaign, Ill., August 1957.

Effects on work as a status source, the concept of work and leisure, work satisfaction, skills, and the labor force.

6.20 Karsh, Bernard. "White-Collar Labor," The Nation, January 31, 1959, pp. 93-96.

Discusses decrease in number of blue-collar workers and increase in white-collar workers, and concern of both groups for safeguarding their future against growing automated machine competition. Examples of trade union implications in longshoring, airline, auto, electronics, machinery, and printing industries.

6.21 Malabre, Alfred L. "Automation's Impact," Wall Street Journal, August 27, 1959, p. 1 ff.

Effects of automation on Whirlpool's Evansville, Ind., plant work force; new trades, transfers, downgradings, layoffs, and relief payments. Effects on community business, population, and example of joint city-business new industry promotion.

6.22 McGill, George S. "Staffing an Atomic Energy Plant; the Shippingport Experience," Labor Market and Employment Security. March 1959, pp. 1-7.

Presents unique staffing problems of first large-scale nuclear power plant. Selection and training, initial organization, occupational composition and functions, employee characteristics, and factors affecting efficiency.

6.23 McKenna, J. V. "Must Automation Destroy Labor?" America, February 18, 1961, pp. 661-663.

Trends in industrial technology and implications for jobs, skills, manpower, and occupational structure. Examples of union and Air Force sponsored retraining programs.

6.24 New York, Department of Labor. Manpower Requirements in Electronics Manufacturing; Outlook to 1964 in the New York metropolitan area (New York, December 1960). 154 pp.

Survey data from 288 firms on current employment, hiring specifications, and future demand and supply for 41 occupations. Detailed job guides to 36 occupations, nature of jobs, and employment prospects.

6.25 Northrup, Herbert R. "Automation: Effects on Labor Force, Skills and Employment," Industrial Relations Research Association Proceedings, 1958, pp. 35-45.

Meaning of automation and effects on occupations, skills, unemployment, and union relations.

6.26 Patterson, William F. "The Changing Technology," Personnel Administrator, February 1960, pp. 5-8.

Effects on skilled crafts, manpower, jobs, and skill requirements. Urgency of updated training and retraining programs. Rise of new occupations.

6.27 Ronayne, Maurice F. "The Personnel Side of Automatic Data Processing," Public Personnel Review, October 1960, pp. 243-248.

Definition, scope, and purpose of, and organizing for, automatic data processing. Jobs in automatic data-processing systems. Qualifications required of applicants. Probable extent of job displacement. Education for automatic data processing. Importance of cooperation of all personnel and support of top management.

6.28 Ruttenberg, Stanley H. "Economic and Social Implications," Monthly Labor Review, February 1959, pp. 164-165. Excerpts from an address before the Conference on Labor and Science in a Changing World, AFL-CIO, Washington, January 7-8, 1959.

Implications of new technology for occupational requirements, wages, seniority practices, work habits and content, attitudes, and unemployment. Goals for policy decisions.

6.29 Scanlon, Burt K. "After You Automate, Then What?" Office Management and American Business, March 1961, pp. 30-32.

Effect of data-processing equipment in an insurance firm and a bank on employment, job content, salaries, cost, and occupational structure. Use of attrition to prevent layoffs.

6.30 Slater, Robert E. "Thinking Ahead: How Near Is the Automatic Office? " Harvard Business Review, March/April, 1958, pp. 27-31.

Limitations of data-processing equipment. Effects on organizational structure. Selection, training, and utilization of computer personnel.

6.31 Smith, Robert M. "Sweeping Personnel Changes Foreseen As Result of New Automation Developments," Office Management and American Business, August 1960, pp. 11-14 ff; September 1960, pp. 42-44.

Shifts in occupational requirements and defense manpower demands and implications for skills, office employment, unemployment, and labor market, research, and service industries. Effects on clerical workers and management.

6.32 Tewson, Vincent. "Shorter Hours and Automation," Free Labour World, December 1960, pp. 497-500.

Problems of and motives for, shorter working hours. Implications for labor mobility, easing the transition, and problems of shift work.

6.33 U.S. Department of Labor, Bureau of Employment Security. Occupations in Electronic Data-Processing Systems (Washington, U.S. Government Printing Office, January 1959). 44 pp.

Thirteen occupations analyzed according to: job definition; education, training, and experience; special characteristics; aptitudes; interests; temperaments; and physical demands and working conditions. Bibliography on automation.

6.34 U.S. Department of Labor, Bureau of Employment Security. Selected Occupations Concerned with Atomic Energy, No. E-197 (Washington, U.S. Government Printing Office, June 1961). 57 pp.

Job definitions, education, training, and experience requirements; special worker characteristics, aptitudes, and temperaments required; physical demands and working conditions.

6.35 U.S. Department of Labor, Bureau of Employment Security. Technical Occupations in Research, Design, and Development Considered as Directly Supporting to Engineers and Physical Scientists, No. E-194 (Washington, U.S. Government Printing Office, February 1961). 113 pp.

Characteristics and sources of research, design, and development technicians. Work activities, where employed, educational and training requirements; aptitudes, interests, and temperaments required; physical demands and working conditions by occupational category. Job summary and nature of work by occupation.

6.36 U.S. Department of Labor, Bureau of Labor Statistics. Automation and Employment Opportunities for Officeworkers, Bull. 1241 (Washington, 1958). 14 pp.

Effects of installation of electronic computers on employment of clerical workers and occupations. Industries affected. Special report on programmers: nature of work, training, qualifications, earnings, working conditions, and employment outlook.

6.37 U.S. Department of Labor, Bureau of Labor Statistics. Factory Jobs: Employment Outlook for Workers in Jobs Requiring Little or No Experience or Specialized Training, Bull. 1288 (Washington, 1961). 26 pp.

Nature of selected operative occupations in manufacturing. Industries where found, training and qualifications for; earnings, and working conditions.

6.38 U.S. Department of Labor, Bureau of Labor Statistics. Occupational Outlook Handbook, Bull. 1300 (Washington, U.S. Government Printing Office, 1961). 850 pp.

Appraisal of the employment outlook, nature of work, training and other qualifications needed for entry, lines of advancement, job location, and earnings and working conditions in over 650 occupations.

6.39 Wecksler, A. N. "Mechanization Speeds the Shift in Workers' Skills," Mill and Factory, May 1961, pp. 9-13.

Shift in the ratio of white-collar to blue-collar workers in petrochemicals, missiles, electronics, and the electrical field. Trends and experience at General Motors and American Bosch Arma Corp. in occupational mix, labor relations, upgrading, and recruitment.

6.40 Wolfle, Dael. "Forecasting Surpluses and Shortages in Key Occupations," Annals of the American Academy of Political and Social Science, September 1959, pp. 29-37.

Supply-demand relationships for various categories of scientists and engineers in the United States and Europe. Future trends, methods, problems, and uses of forecasting.

6.41 World Health Organization. Mental Health Problems of Automation: Report of a Study Group, Technical Report Series No. 183 (Geneva, 1959). 30 pp.

Scope of the human impact of automation. Mental health consequences of strain among individual workers in automated plants; repercussions of social change through the introduction of automation; and needed activities in the mental health field arising from the introduction of automation.

SECTION 7 - IMPLICATIONS FOR TRAINING, RETRAINING, AND EDUCATION

This section contains references on automation's implications for training, retraining, education, apprenticeship, and counseling. Examples of training programs are included.

7.01 Adams, Alexander and Guerin, Q. W. "Selection and Training of Computer Programmers at the Navy's Electronics Supply Office," Journal of the American Society of Training Directors, November 1959, pp. 22-26.

Description of hiring standards, selection tests, weeding out process, and training program.

7.02 "Auto Workers Learn New Skills," Business Week, July 29, 1961, pp. 74-75.

Description of successful Chester, Pa., retraining programs for workers displaced by auto plant shutdown.

7.03 Barry, F. Gordon and Coleman, C. G., Jr. "Tougher Program for Management Training," Harvard Business Review, November/December 1958, pp. 117-125.

Some characteristics of Bendix Aviation Corp.'s management training program to keep managers alert to changing conditions. Experiences, methods used, and success achieved.

7.04 Brown, Gordon S. "New Scientific Developments in the Area of Automation," The American Economy: An Appraisal of Its Social Goals and the Impact of Science and Technology, Haig Babian, editor (New York, Joint Council on Economic Education, 1958), pp. 87-96.

Technical achievements and their social effects, with emphasis on implications of automation for education.

7.05 "Chemical Technician Training: A Stepping Stone," Chemical and Engineering News, June 13, 1960, pp. 52 ff.

Technician training in State junior colleges New York system compared with other areas.

7.06 Council for Technological Advancement. Trends in Education and Utilization of Technical Manpower--A Critical National Issue, No. 5 of a series on technology and employment (Washington, 1957). 25 pp.

Growth of science and technology and transition in education. Government, industry, and education programs to alleviate the technical manpower shortage.

7.07 Diebold, John. "Automation Needs A Human Policy," Challenge, May 1959, pp. 42-46.

Social obligations and economic problems of management in introducing automation. Displaced workers, older workers, training, retraining, and sharing productivity gains.

7.08 Emerson, Lynn A. Industrial Education in a Changing Democratic Society, Bulletin 33 (Ithaca, N.Y., Cornell University, New York State School of Industrial and Labor Relations, October 1955). 94 pp.

Ten selected papers, 1939-55. Effects of changing production techniques on education and manpower requirements. Need for changes in vocational education and programs to meet future requirements.

7.09 Friedmann, Georges. Industrial Society: The Emergence of the Human Problems of Automation (Glencoe, Ill., The Free Press, 1955). 436 pp.

Implications for skills, training, and the human factor in work.

7.10 Goldberg, Arthur J. "Statement before the Subcommittee on Employment and Manpower," Training of the Unemployed; Hearings, U.S. Senate, Committee on Labor and Public Welfare, 87th Cong., 1st sess., June 7, 1961 (Washington, U.S. Government Printing Office, 1961), pp. 219-260.

Effects of technological developments on workers, employment, production, productivity, skills, and occupational requirements. Implications for training, retraining, counseling, and labor-management relations. Summary of the Administration-sponsored bill, S. 1991 (Clark).

7.11 Groom, Phyllis P. "Retraining the Unemployed,I--European Government Programs," Monthly Labor Review, August 1961, pp. 823-828.

First of a series on retraining; summary of recent congressional retraining legislation. Structure of Government retraining programs in Sweden and France.

7.12 Groom, Phyllis P. "Retraining the Unemployed II--Federal and State Legislation on Retraining," Monthly Labor Review, September 1961, pp. 939-943.

Early training legislation, provisions of the Area Redevelopment Act, and State training legislation and unemployment insurance laws. Second in aseries; articles are to follow on a community retraining program, retraining by unions, and considerations in developing a Government program.

7.13 "The Hard Realities of Retraining," Fortune, July 1961, pp. 241-242 ff.

Results and problems of various retraining programs undertaken by industry and government. Need for upgrading labor force.

7.14 Hart, Dale J. and Lifton, Walter M. "Automation and Counseling," The Personnel and Guidance Journal, December 1958, pp. 282-287.

Examination of psychological phenomena resulting from technological change. Meaning for the individual. Effect on schools.

7.15 Hathaway, A. G. "New Tools for Technical Trainers," I.S.A. Journal, December 1960, pp. 46-47.

Instrument Society of America task force defines technical instrumentation personnel in terms of their job functions.

7.16 Hoy, George A. "Maintenance Training," Factory, February 1960, pp. 89-100.

Advantages of training and faults in U.S. maintenance training practices. Standards of training. Trainee selection problems and aids. Description of training programs at selected large and small plants. Typical training problems and solutions reported by 40 plants.

7.17 Hughes, J. L. "Industrial Applications of Teaching Machines," Journal of the American Society of Training Directors, July 1961, pp. 30-41.

Summary of some research findings from industrial studies. Effects of programmed instructions on employee attitudes, learning time, and achievements. Preparation of, time, and cost of programmed instruction materials. Introduction into company training programs.

7.18 Hull, George F., Jr. and Cummings, H. B., Jr. "TVA Courses Develop Engineering Assistants," Electrical World, January 30, 1961, pp. 40-42.

Benefits from training program. Problems in trainee selection. Lecture courses and on-the-job training.

7.19 Hyman, I. Harry. "The Craftsman--Today's Vanishing American," American Machinist/Metalworking Manufacturing, April 4, 1960, pp. 121-124. Reprinted by U.S. Department of Labor, Bureau of Apprenticeship and Training.

Qualifications and shortages of trainees. Revising outmoded training.

7.20 "ITU Meets New Technology Head On!" Graphic Arts Monthly, October 1960, pp. 34-40. Reprinted by U.S. Department of Labor, Bureau of Apprenticeship and Training.

International Typographical Union training program and center for retraining skilled printers and mailers. Content of courses offered.

7.21 Karp, H. R. "How Two Companies Train Technicians," Control Engineering, December 1956, pp. 65-69.

Description of training programs at Carbide and Carbon Chemical Co., and Ford Motor Co. Selecting trainees, classroom and laboratory training, apprenticeship and refresher courses, curriculum, textbooks, and training aids.

7.22 Katis, R. F. "Training for Automation," American Machinist/Metalworking Manufacturing, November 28, 1960, pp. 152-153. Reprinted by U.S. Department of Labor, Bureau of Apprenticeship and Training. 2 pp.

Description of a technician training program designed to help staff a new and highly automated electrical machinery plant.

7.23 Kaufman, Jacob J. "Labor Mobility, Training, and Retraining," Studies in Unemployment, U.S. Senate, Special Committee on Unemployment Problems, 86th Cong., 2d sess. (Washington, U.S. Government Printing Office, 1960), pp. 343-365.

Factors influencing labor mobility and labor surplus areas. Changes in the labor force and skill requirements. Objectives of training and retraining programs, types and facilities of training. Labor mobility in Pennsylvania.

7.24 "Macy's Contract Pledges Retraining," Business Week, April 29, 1961, pp. 81.

Describes retraining clause in union contract requiring retraining of department store employees whose jobs are eliminated by automation.

7.25 McCauley, John S. "BAT and Community Apprenticeship Committees," Journal of the American Society of Training Directors, November 1958, pp. 16-19. Reprinted by U.S. Department of Labor, Bureau of Apprenticeship and Training, 1958. 4 pp.

Trends in industrial training. Promotion of training, research, and technical assistance by Bureau of Apprenticeship and Training. Findings of BAT studies on effects of mechanization on foundry skill requirements.

7.26 Metaxas, Ted. "Maintenance Training . . . Your Best Source of New Skills," Mill and Factory, April 1960, pp. 81-84. Reprinted by U.S. Department of Labor, Bureau of Apprenticeship and Training. 3 pp.

Description of skilled trades training program of a large appliance manufacturer. Selection of trainees, training on the job and in class, and apprenticeship.

7.27 Mueche, Howard O. "The Demands of Automation," American Vocational Journal, April 1961, pp. 12-13 ff.

Implications for skills, training, employment, with special attention to older workers.

7.28 Peters, Otis F., Jr. "Plant Craft Training Responsibility," Bell Telephone Magazine, Autumn 1959, pp. 51-58.

Objectives and methods of plant craft employee training program as a continuous activity. Areas of responsibility for staff and line organizations and individual craftsman.

7.29 "Retraining Works for the Fortunate Few," Business Week, June 17, 1961, pp. 73-74.

Describes retraining program for displaced miners near abandoned coal pits in Belgium. Problems of older workers, new skills, and job acquisitions.

7.30 Statt, C. J. "Automation and Its Demands on the Technical Institutes," Technical Education News, Vol. 16, special issue, 1956, pp. 7-9.

Points out demands on technical institutes for training more, better, and new kinds of technicians.

7.31 Steel, Marion. "Vocational Counseling for the Future," The American Child, March 1960, pp. 17-20.

Effects of automation on future work opportunities and workers. New opportunities in both automated and nonautomated fields.

7.32 U.S. Congress, House of Representatives, Committee on Education and Labor. Manpower Utilization and Training; Hearings, Subcommittee on Unemployment and the Impact of Automation, 87th Cong., 1st sess., June 6, 13, 14, 1961 (Washington, U.S. Government Printing Office, 1961). 171 pp.

Statements by 12 educators, businessmen, and Government and union officials on the manpower training and utilization bill, H.R. 7373 (Holland). Includes examples of training and retraining, effects of changing technology on occupational requirements, skills, training, retraining, and education.

7.33 U.S. Congress, Senate, Committee on Labor and Public Welfare. Training of the Unemployed; Hearings, Subcommittee on Employment and Manpower, 87th Cong., 1st sess., March 20, 21, June 5 and 7, 1961 (Washington, U.S. Government Printing Office, 1961). 405 pp.

Statements by 21 educators, business, labor, Government, and industrial development officials on manpower training and utilization bills; periodical articles, and other information. Examples of State and local training and retraining programs. Impact of technical change on training, retraining, skills, occupational requirements, and labor-management relations.

7.34 U.S. Department of Labor, Bureau of Apprenticeship and Training. Apprenticeship and Training in the Contract Tool and Die Industry, T-150 (Washington, November 1959). 31 pp.

Study of training practices and needs in 2,434 firms. Implication of technological change for skills and training.

7.35 U.S. Department of Labor, Bureau of Apprenticeship and Training. Foundry Training Needs (Washington, May 5, 1956). 20 pp. Summarized by John S. McCauley in Monthly Labor Review, October 1957, pp. 1224-1228.

Study of effects of mechanization on training, skills, occupations, and employment, in 41 large highly mechanized foundries.

7.36 U.S. Department of Labor, Bureau of Apprenticeship and Training. Foundry Training Needs: Job Foundries (Washington, May 8, 1957). 18 pp. Summarized by John S. McCauley in Monthly Labor Review, October 1957, pp. 1224-1228.

Survey of changes in mechanization, employment, occupational structure, skill and training requirements in 101 semiproduction, specialty, and job foundries.

7.37 U.S. Department of Labor, Bureau of Apprenticeship and Training. Manpower Requirements and Training Needs in Construction Industry Occupations, 1960-70 (Washington, December 1959). 12 pp.

Examples of, and need for, training programs to keep workers abreast of new methods and materials. Number of journeymen required and number in apprenticeship training.

7.38 U.S. Department of Labor, Bureau of Apprenticeship and Training. Training and Retraining in Depressed Areas: A Case Study of How BAT Works With Community Groups in Hazelton, Pa., Bull. T-152 (Washington, March 1961). 8 pp.

Description of the organization of a communitywide training program and industrial development efforts.

7.39 U.S. Department of Labor, Bureau of Apprenticeship and Training. Training--The Key to the Future: Apprenticeship in Electronic Occupations, Special Program Report No. 2 (Washington, April 1961). 97 pp.

Report on electronic technician training at Raytheon Co. Qualifications, selection, and training of apprentices. Industry advisory committee operations. Apprentice wages and ratio to journeymen, standards, training schedule, test questions, forms, and reports.

7.40 Viscardi, Henry, Jr. "Can Disabled Workers Meet the Demand of Automation?" Advanced Management, July 1957, pp. 14-16.

Implications of automation for disabled workers. Describes growth of a manufacturing firm employing only disabled workers, training, and mechanization experiences.

7.41 Wilcox, Glad. "The Challenge of Automation to Technical Education," School Shop, June 1957, pp. 9-11.

Implications for technical education. Reports findings of company studies on impact on education. Technical training needs.

7.42 Winthrop, Henry. "Some Psychological and Economic Assumptions Underlying Automation," Pts. I-II. The American Journal of Economics and Sociology, July 1958, pp. 399-412; October 1958, pp. 69-82.

Analysis of representative ideas presented at the 1956 symposium on "the social meaning of automation" (sponsored by the American Psychological Association), regarding retraining, upgrading and intelligence, job satisfaction, occupational change, unemployment, leisure, consumption, natural resources, and the role of banking.

7.43 Wolfbein, Seymour L. "Education and Employment," The Nation's Children 2: Development and Education, Eli Ginzberg, editor (New York, Columbia University Press, 1960), pp. 138-157. Published for the Golden Anniversary White House Conference on Children and Youth.

Youth in the work force of the 1960's. Industrial and occupational change. Importance of education and training in responding to new opportunities.

7.44 Yearley, C. K., Jr. "Automation and Public-Sponsored Education," Adult Education, Spring 1957, pp. 169-173.

Effects on adult education, training, skills, and management structure.

7.45 Zollitsch, Herbert G. "Maintenance Training Methodology for Automation: Some Findings From a Pilot Study in a New Factory," ILR Research, March 1957, pp. 14-16.

Techniques and methods in training maintenance mechanics to keep automatic equipment breakdown time to a minimum. Training requirements and preparation of instructional materials.

SECTION 8 - IMPLICATIONS FOR LABOR-MANAGEMENT RELATIONS AND POLICIES

This section cites examples of collective bargaining approaches to automation's impact, union attitudes, and advance personnel planning. Implications for unions, collective bargaining, seniority, work rules, and unemployment benefits are covered.

8.01 "A Bigger Role for the Clerks?" Railway Age, July 29, 1957, pp. 19 ff.

Statement of George Harrison, president, Brotherhood of Railway Clerks, on union policy toward introduction of electronic computers in the railroad industry.

8.02 "Adjustment to Technological Change," AFL-CIO Collective Bargaining Report, April/May 1958, pp. 25-31.

Union attitudes and bargaining approaches. Examples of negotiated adjustment programs for workers displaced by automatic elevators; railroad office employees affected by adoption of an electronic computer; and production workers affected by new technology at an oil refinery.

8.03 AFL-CIO. The Changing Character of American Industry. Papers delivered at the Conference on the Changing Character of American Industry, sponsored by the American Federation of Labor and Congress of Industrial Organizations, January 16, 1958. Publication No. 67 (Washington, 1958). 86 pp.

Papers by Ewan Clague, George W. Taylor, Walter Isard, and Victor Fuchs on the shifting composition of the work force, movement of industry to new locations, and impact of industrial and technological change on collective bargaining.

8.04 AFL-CIO, Department of Research. Labor Looks at Automation, Publication No. 21 (Washington, revised July 1959). 27 pp.

Concept of continuous automatic production, feedback controls, data processing, and numerically controlled machine tools. Implications for productivity, displacement, job opportunities, collective bargaining, seniority, wages, etc. Need for cushioning impact of layoffs, transfers, and changes in skill requirements.

8.05 AFL-CIO, Industrial Union Department. Automation and Major Technological Change, Collective Bargaining Problems, Papers presented at a conference held April 22, 1958 (Washington, 1958). 45 pp.

Describes effects of automation on wages, working conditions, and labor relations at Ford Motor Co. Job and income security ramifications of railway mergers and abandonments. Handling wage incentive problems which are due to technological change.

8.06 AFL-CIO, Industrial Union Department. Automation and Major Technological Change, Impact on Union Size, Structure and Function, conference panel discussion, April 22, 1958 (Washington, 1958). 25 pp.

Comments by Daniel Bell, James Stern, Otto Pragan, Warren Woods, and Everett M. Kassalow. Implications of increase in number of nonproduction workers. Jurisdictional problems. Changes in union power, job character, working conditions, and pay methods.

8.07 AFL-CIO, Industrial Union Department. Labor Looks at the White-Collar Worker; Proceedings, Conference on Problems of the White-Collar Worker (Washington, February 20, 1957). 79 pp.

Papers and addresses by eight labor and Government officials. Effects of automation on white-collar workers. Summary of labor's views of white-collar workers and their problems.

8.08 Aronson, Robert L. "Automation--Challenge to Collective Bargaining," New Dimensions in Collective Bargaining, edited by Harold W. Davey and others (New York, Harper, 1959), pp. 47-70. Reprinted by Cornell University, New York School of Industrial and Labor Relations, Reprint No. 79. Ithaca, 1959. 70 pp.

Effects on union structure and Government, union policies, scope and content of the collective agreement, and labor relations.

8.09 Association of Supervisory Staffs, Executives, and Technicians. Automation: A Challenge to Trade Unions and Industry (London, 1956). 27 pp.

Nature of automation and function of unions during transition. Implications for skills, unemployment, wealth, living standards, leisure, power, and raw materials.

8.10 "Automation and the IBEW," The Electrical Workers' Journal, March 1961, pp. 2-5 ff.

Technical trends in utilities, construction, atomic power and use of radioisotopes, instruments and controls, railroads, radio-television, and telephone, and effects on jobs, skills, and transfers. International Brotherhood of Electrical Workers' attitudes, collective bargaining, and other activities.

8.11 Automation Committee (chairman, Clark Kerr). Progress Report (Chicago, June 19, 1961). 29 pp. Excerpts in Monthly Labor Review, August 1961, pp. 851-857.

Committee formed under agreements of September 1, 1959, between Armour and Co. and United Packinghouse, Food and Allied Workers, and between Armour and Amalgamated Meat Cutters and Butcher Workmen of North America. Findings in committee research on plant closings, labor market, and transfers. Description of reemployment efforts, retraining program, and experimental transfer plan. Separate statement by the unions on impact of automation and Government responsibilities.

8.12 Backman, Jules. "The Size of Crews," Labor Law Journal, September 1961, pp. 805-815.

Effects of technological change on crew size. Railroad contractual arrangements and State laws. Crew size in maritime, airline, longshore, construction, and other industries. Flexibility in crew rules and cost.

8.13 Baker, Elizabeth F. Printers and Technology: A History of the International Printing Pressmen and Assistant's Union (New York, Columbia University Press, 1957). 545 pp.

Effects of changing technology upon printing and printing trades' unionism, union-management relations, unemployment, and job content.

8.14 Bannon, Ken and Samp, Nelson. "Impact of Automation on Ford-UAW Relationships," Monthly Labor Review, June 1959, pp. 612-615.

Effects on wage rates and classifications of automated jobs, skills, retraining, seniority adjustments, and highly skilled trades.

8.15 Barbash, Jack. "Automation and Collective Bargaining," The American Federationist, June 1957, pp. 18-19.

Union objectives: resistance to reductions in job opportunities, participation in introduction of technological changes, resistance to wage cuts, enforcement of safe working conditions, conservation of a craft's skill standards, and protection of union jurisdiction.

8.16 Beirne, Joseph A. The Job Revolution in Telephones (Washington, 1959). Communications Workers of America, Education Department. 10 pp.

Changes in number and job composition of telephone industry workers. Portent for union activities. Steps to cope with decreasing employment.

8.17 Beirne, Joseph A. Why We Welcome Automation (Washington, 1959). Communications Workers of America, Education Department. 11 pp.

Automation in telephone industry: Potential gains and ways of mitigating harmful effects.

8.18 Black, James Menzies. "The Hidden Trap in Automation," Dun's Review and Modern Industry, May 1961, pp. 53-54 ff.

Implications and outlook for labor relations, retraining, skills, productivity, and Government. Problems of displacement and older workers.

8.19 Braunthal, Alfred. "The Trade Union Movement Faces Automation," International Labour Review, December 1957, pp. 540-557.

Predicted effects on union structures. Responsibilities of employers and the community to cope with unemployment through retraining and relocating of workers. Ways of sharing the gains.

8.20 Brooks, Thomas. "Displaced Workers," Challenge, January 1960, pp. 18-22.

Cushioning impact on displaced workers through union-management agreements. Union approaches in the steel, garment, printing, railroad, longshoring, and meatpacking industries.

8.21 Burtle, James. "Automation, the Guaranteed Wage and Hours of Work," International Labour Review, December 1957, pp. 540-557.

Implications of automation for guaranteed annual wage and shorter hours of work. Tensions of adjustment. Advantages and disadvantages of the dual job.

8.22 Einzig, Paul. "Automation and Industrial Relations," International Social Science Bulletin, vol. 10, no. 1, 1958, pp. 29-37.

Outlines problems, their range and variety, difficulty and importance of finding solutions. Importance of economic background in displacement effects of automation. Effects on wages, wage differentials, living standards, allocation of benefits, and occupational structure. Ways to mitigate hardships.

8.23 Fairley, Lincoln. "Problems of the West Coast Longshore Mechanization Agreement," Monthly Labor Review, June 1961, pp. 597-600.

Problems in bargaining, tax liability of contributions to automation fund, and third party participation. Effects on load size, multiple handling of cargo on the dock, future wage negotiations, unemployment, and on other industries.

8.24 Fleming, R.W. "Collective Bargaining Approaches to Job Security." Address to the Seventh Annual Industrial Relations Conference, University of Michigan, March 29, 1961. U.S. Senate, Committee on Labor and Public Welfare, Training of the Unemployed; Hearings, Subcommittee on Employment and Manpower, 87th Cong., 1st sess. (Washington, U.S. Government Printing Office, 1961), pp. A39-45.

Operations and experience of the Armour Automation Committee. Aiding displaced workers through severance pay, training and retraining, interplant transfers, spreading the work, and advance notice of plant changes.

8.25 Gallagher, B.F. "Con Edison Automation Lauded by Labor, Press," Industrial Bulletin, April 1960, pp. 2-7.

Describes technological developments at Consolidated Edison, changes in production and employment, and company experience with attrition, transfers, and upgrading of employees. Description of new Indian Point atomic generating station and implications for labor-management relations.

8.26 Goldberg, Arthur J. "Mechanization...A Problem for Management, Labor and Government," Mill & Factory, May 1961, pp. 7-9.

Need for rapid improvement in plant and equipment and examples of labor-management contributions to problems of training, relocation, and other employee adjustments. Role of Government.

8.27 Goldfinger, Nathaniel. "Dealing With Automation in the Contract," Automation and the Union Health and Welfare Dollar; Proceedings, Ninth Annual Industrial Relations Center Labor Conference, February 14-15, 1957 (Minneapolis, Minn., 1957), pp. 13-18.

Need for advance notice to unions of plans for introducing automation, broader seniority concepts, retraining, layoff, recall and rehiring provisions. Problems in bumping, transfer, wage rates, downgrading, and incentive and job evaluation plans.

8.28 Gomberg, William. "The Work Rule Problem and Property Rights in the Job," Monthly Labor Review, June 1961, pp. 595-596.

Necessity for acknowledgment of worker's property right in his job. Labor viewed as capital charge on enterprise. Plea for experimentation in collective bargaining.

8.29 Gomberg, William. "The Work Rules and Work Practices Problem," Industrial Relations Research Association Proceedings, 1961 Spring Meeting 1961, pp. 643-654.

Conflicting property concepts and evolution of property rights in jobs. Conflicts over jurisdication and featherbedding. Collective bargaining approaches to develop a solution to work rules controversy in the longshore, railroad, and steel industries, and procedural changes likely to develop.

8.30 Hayes, A.J. "Automation and Featherbedding," AFL-CIO Free Trade Union News, June 1961, p. 8.

Examples of featherbedding in labor and management; how, where, and why it occurs. Proposals to help workers adjust to technological change.

8.31 Hildebrand, George H. "The Use of Tripartite Bodies to Supplement Collective Bargaining," Industrial Relations Research Association Proceedings, 1961 Spring Meeting, 1961, pp. 655-664.

Examples of tripartite study committees and arbitration boards formed to deal with adjustment to change. Purpose, duties, and contributions to collective bargaining. Experiences of bilateral cooperation and the case for introducing neutrals.

8.32 Horowitz, Morris A. "The Diesel Firemen Issue on the Railroads," Industrial and Labor Relations Review, July 1960, pp. 550-558.

Describes background of diesel firemen issue, summarizes findings and recommendations of a Canadian Royal Commission investigation of this issue on the Canadian Pacific Railway in 1957, and appraises factors influencing U.S. railroad negotiations.

8.33 International Association of Machinists. Meeting the Problems of Automation Through Collective Bargaining (Washington, December 1960). 41 pp.

Compilation of union contract clauses and case descriptions related to automation. Specific data presented on such topics as advance notice, training, seniority, maintenance of income, establishing new jobs, and sharing productivity gains.

8.34 International Longshoremen's and Warehousemen's Union (Ind.) Information and Union Comment on the 1960 Mechanization and Modernization Fund Agreement between the Longshoremen of the Pacific Coast and the Steamship and Stevedoring Employers (San Francisco, November 1960). 12 pp.

Summary of provisions, worker benefits, employer guarantees, and changes in methods, with union comment on each item.

8.35 Kassalow, Everett M. "Formula for Industrial Progress," I.U.D. Digest, Winter 1960, pp. 79-88.

Implications of automation and plant relocation and kinds of employment and income protection needed. Examples of union-management experience in dealing with automation's effects in railroads, longshoring, meatpacking, electrical work, electric and gas utilities, and in the chemicals, food, automobile, and steel industries.

8.36 Kossoris, Max D. "Working Rules in West Coast Longshoring," Monthly Labor Review, January 1961, pp. 1-10.

Recent history of labor relations between Pacific Maritime Association and International Longshoremen's and Warehousemen's Union (Ind.). Development of restrictive work rules and recent changes in union strategy removing restrictions and allowing mechanization in exchange for gain sharing and mechanization-fund payments. Development and use of a man-hour measurement and reporting system. Potential impact on the work force and cost to employers.

8.37 "Labor Problems of Modernization in the Textile Industry," International Labour Review, June 1960, pp. 527-556.

Reviews modernization plans in selected industrially advanced and developing countries. Discusses problems of redundancy, displacement, transfers, application of work study methods, training, working conditions, and labor-management relations. Examples of solutions.

8.38 Lasher, Albert C. "How To Avoid Labor Woes When You Automate," Dun's Review and Modern Industry, April 1960, pp. 42-44.

Use of manpower planning, attrition, retraining, collective bargaining, and communication to dispel worker fears and prevent hardships. Examples of joint labor-management cooperation.

8.39 Livingston, John W. "The Transitional World of the White-Collar." The American Federationist, March 1961, pp. 6-9.

Increase in number of white-collar workers and decline of their advantages in wages, job security, and stability. Changes in working conditions and job content. Obstacles to and guidelines for organizing.

8.40 Minnesota, University of. Automation and The Union Health and Welfare Dollar; Proceedings. Ninth Annual Industrial Relations Center Labor Conference, February 14-15, 1957 (Minneapolis, 1957). 52 pp.

Includes papers by Frank McCallister, Nathaniel Goldfinger, and Jules Pagano and three workshop discussions on types of automation, management motives, labor's attitudes, industrial relations, and Government role. Collective bargaining problems: advanced notice to union, seniority and severance-pay provisions, retraining, and wage rates. Effects in the communication industry on job content, skills, transfers, bargaining unit, and seniority.

8.41 "More Machines, Fewer Men--A Union That's Happy About It," U.S. News and World Report, November 9, 1959, pp. 60-64.

Interview with John L. Lewis. Attitude of United Mine Workers (Ind.) toward improved technology, increased mining efficiency, loss of jobs, and foreign competition. Gains of miners from increased productivity.

8.42 National Association of Manufacturers. Labor-Management Developments--Challenge to the Nation (New York, 1961). 36 pp.

Excerpts from panel discussion at NAM's 65th Congress of American Industry, with introduction by C. Kothe. Policies to encourage and create public understanding of automation, to dispel worker's fears and prevent hardships, by J. Diebold. Unemployment problems by M. Robertson. Basic premises underlying Government interest, nature of unemployment, and Government proposals to minimize impact on work force.

8.43 Neuloh, Otto. "Paving the Way for Technological Change," Personnel, March/April 1958, pp. 21-26.

Long-term benefits and worker attitudes toward automation. Based on studies of West German workers in automated plants. Precepts for management to allay fears and prepare workers for radical changes in job content.

8.44 New York City Central Labor Council. Unions Meet Automation and a Program for Action, Conference on automation, November 29, 1960 (New York, 1960). 14 pp.

Effects on jobs, productivity, and employment. Plant, unit, company, and industry collective bargaining goals, government programs, shorter workweek, and community facilities and services.

8.45 "No Shuttlecocks at Parlin," Fortune, February 1961, pp. 189-190.

Union-management relations in introducing technological change at the Parlin, N.J., plant of du Pont Photo Products Dept. Problems created by shift work and absenteeism among women workers.

8.46 Pastin, John J. "Office, Technical Workers Weigh USW Protection," Steel Labor, March, 1961, p. 1.

Automation's effects on white-collar workers and United Steelworker's organizing efforts. Need for retraining and new seniority provisions.

8.47 "Pressures in the Print Shop," Fortune, July 1960, p. 214.

Effect of technical progress on labor relations in printing industries.

8.48 Raskin, A. H. "The Squeeze on the Unions," Atlantic Monthly, April 1961, pp. 55-60.

Impact of technology on unions' strength and ability to successfully strike.

8.49 Rush, C. H. "Implications of Electronic Data Processing for Industrial Relations Research," Industrial Relations Research Association Proceedings, 1957, pp. 63-73.

Relationship between EDP and research. Research needs and problems.

8.50 "Seniority--Fair Play on the Job," The American Federationist, September 1961, pp. 24-28.

Influence of seniority rights on workers' attitudes to technological change. Types of rights and benefits usually linked to length of service. Development and advantages of preference by seniority. Effects of seniority on labor efficiency and mobility.

8.51 Shultz, George P. and Weber, Arnold R. "Technological Change and Industrial Relations," Employment Relations Research, edited by Herbert G. Heneman, Jr., and others (New York, Harper, 1960), pp. 190-221.

Analysis of major academic and Government research projects conducted during 1950-60 and statements by union and management officials. Effects on working conditions, employment, occupational structure, and industrial relations.

8.52 Siegel, Abraham and Myers, Charles A. "Continuity and Change in American Labor Problems," Postwar Economic Trends in the United States, Ralph E. Freeman, editor (New York, Harper, 1960), pp. 191-234.

Includes section on growing impact of science and technology on labor.

8.53 Silvey, Ted F. "Automation: Labor's Viewpoint," Tool Engineer, November 1956, pp. 74-76.

Impact of changing technology on workers, education, and skill requirements. New, broadened responsibilities for management. Methods of sharing gains. Trade union views.

8.54 Slichter, Sumner H., Healy, James J., and Livernash, E. Robert. "Union Policies Toward Technological Change," The Impact of Collective Bargaining on Management (Washington, Brookings Institution, 1960), pp. 342-371.

Determinants and consequences of policy. Policies of willing acceptance, opposition, competition, encouragement, and adjustment.

8.55 "Special bargaining Convention of the United Auto Workers," Monthly Labor Review, June 1961, pp. 611-613.

Summary of resolutions on job security and technological change; legislative and bargaining goals.

8.56 Stern, James L. "Fact, Fallacy, and Fantasy of Automation," Industrial Relations Research Association Proceedings, 1958, pp. 46-58.

Need for broad integrated research. Problems of upgrading, displacement, and economic growth. Impact on productivity, occupational requirements, and employment.

8.57 Stessin, Lawrence. "Spell Out Freedom To Mechanize in Your Contract," Mill and Factory, May 1961, pp. 18-20.

Recent union reaction to technological changes. Innovations in management upgrading policy. Examples of "management rights" contract clauses spell out right to make changes. Increased importance of retraining and severance pay in collective bargaining, with examples.

8.58 Stieber, Jack. The Steel Industry Wage Structure: A Study of the Joint Union-Management Job Evaluation Program in the Basic Steel Industry (Cambridge, Mass., Harvard University Press, 1959). Chapter 8, pp. 135-158.

Classification negotiations, labor market pressures, and technological change.

8.59 Strong, George E. "The Need for Factual Data in Dealing With Problems of Technological Change," Labor Law Journal, December 1960, pp. 1093-1096.

Speech before the Federal Mediation and Conciliation Service's Fifth Annual Southeastern Conference on Current Trends in Collective Bargaining, November 30-December 2, 1960. Stresses need for a central clearinghouse for information on automation, more research, and more complete and accurate data.

8.60 Suffridge, James B. "Automation's Impact Has Us Worried," The American Federationist, May 1958, pp. 12-13, 28-29.

Technical trends and outlook in retail trade. Implications for labor.

8.61 U.S. Department of Labor, Bureau of Labor Statistics. "Union Adjustment to Technological Change," A Guide to Labor-Management Relations in the United States, BLS Bull. 1225, section 2:05 (Washington, U.S. Government Printing Office, March 1958).

Union attitudes, collective bargaining provisions, and specific examples of adjustment to change.

8.62 "Why This Union Boss--And His Local--Go For Automation," Factory Management and Maintenance, April 1957, pp. 88-89.

Lithographers' Local No. 1 president reports his union supports automation, on the grounds that labor benefits.

8.63 Wilcock, Richard C. "Fast-Changing Technology--Its Impact on Labor Relations," The Pennsylvania Business Survey, December 1959, pp. 3-9. Reprinted in University of Illinois Bulletin, Urbana, Ill., Reprint Series No. 81.

Occupational trends and changes in employment, unemployment, labor mobility, and skill levels. Impact on union membership and economic power, labor relations, collective bargaining, education, and worker attitudes.

8.64 Wirtz, W. Willard. "The Future of Collective Bargaining," Monthly Labor Review, November 1961, pp. 1206-1209.

Includes discussion of some problems automation poses for collective bargaining, such as work rules and retraining.

SECTION 9 - IMPLICATIONS FOR BUSINESS MANAGEMENT AND ORGANIZATION

This section includes references on automation's consequences for business management, organization, techniques, policy, and planning. Examples and case studies of company planning for conversion to automation and guides for personnel planning are included.

9.01 American Management Association. The Changing Dimensions of Office Management: Technical and Managerial Trends in Administrative Operations, AMA Management Report No. 41 (New York, 1960). 159 pp.

Papers by 25 experts describe changes in data processing, systems planning, office services, design, and maintenance of office facilities. Impact of change on traditional concepts of office management, effectiveness of office operations, the office manager's job, and outlook.

9.02 American Management Association. Electronics in Action; The Current Practicality of Electronic Data Processing, Special report No. 22 (New York, 1957). 156 pp.

Papers by representatives of companies with well-established programs, concerning feasibility studies, installation, selection and training of personnel, applications' evaluation, and new frontiers.

9.03 American Management Association. Keeping Pace With Automation: Practical Guides for the Company Executive, Special Report No. 7 (New York 1956). 136 pp.

Papers by 13 business experts on effects of automation on manufacturing, equipment, product design, plant layout, and manpower. Implications for management, unemployment, workers' welfare, industry, and society as a whole. Successful company experiences with automated processes at Stromberg-Carlson, Carborundum, Dixie Cup, and Minute Maid. Basic concepts, approaches, and future trends.

9.04 Anshen, Melvin. "The Manager and the Black Box," Harvard Business Review, November/December 1960, pp. 85-92.

Classification of potential and limitations of new mathematical techniques in business by different types of management decisions. Implications for business policy and planning.

9.05 Baumes, Carl G. Administration of Electronic Data Processing, Studies in business policy, No. 98 (New York, National Industrial Conference Board, 1961). 136 pp.

Administrative problems in change from conventional to electronic data processing. Case studies of how experienced companies surmounted the problems. Planning feasibility and systems studies, studying equipment, organizing computer operations, defining jobs and selecting personnel, evaluating performance and progress, and gaining employee cooperation.

9.06 Becker, Esther R. and Murphy, Eugene F. The Office in Transition: Meeting the Problems of Automation (New York, Harper 1957). 190 pp.

Implications for personnel planning, human relations, unionization, and management. Description of punch card, computers, integrated data processing. Standardizing work methods, programming, and controlling accuracy in the automatic office.

9.07 Bekker, John A. "Automation: Its Impact on Management," Advanced Management, December 1959, pp. 20-24.

Effect on organization and techniques, manpower and maintenance requirements, education, and training.

9.08 Canning, Richard G. Installing Electronic Data Processing Systems (New York, Wiley, 1957). 193 pp.

Covers planning, installing, programming, conversion, and early phases of operation for management officials. Appendix on personnel problems.

9.09 Coburn, H.B. "Alerting the Staff on the Move to Automation," Burroughs Clearing House, June 1961, pp. 39-40.

Describes personnel planning by Chase Manhattan Bank prior to introducing electronic data processing equipment.

9.10 Creamer, Daniel. "Is Automation Capital Saving?" Conference Board Business Record, November 1958, pp. 482-484.

Implications for space requirements, utilization of materials and equipment, safety, inventories, and cash requirements.

9.11 Diebold, John. "Automation As a Challenge to Management," International Social Science Bulletin, vol. 10, no. 1, 1958, pp. 37-43.

Discussion of four common stereotyped ideas on automation concerning size and production of firms, types of potentially automated operations, laborsavings, and best applications.

9.12 "Free Hand for Sun's Automaters," Business Week, January 10, 1959, pp. 45 ff.

Describes staff reorganization to spur automation and renovation of oil company's older plants.

9.13 Ginzberg, Eli and Reilley, Ewing W., and others. Effecting Change in Large Organizations (New York, Columbia University Press). 155 pp.

Focuses on the process of decentralization in large enterprises. Role of the president and vice president during period of organizational change.

9.14 Gustafson, Philip. "What Management Is Learning From Computers," Nation's Business, November 1958, pp. 38-39 ff.

Examples of computer application and implications for management organizational patterns and personnel planning.

9.15 "It Doesn't Always Pay to Put All Your Chips on Automation," Business Week, August 10, 1957, pp. 58-64.

Construction, production, and labor difficulties at an automatic assembly line for automobile frames.

9.16 Jasinski, Frank J. "Adapting Organization to New Technology," Harvard Business Review, January/February 1959, pp. 79-86.

Organizational changes and readjustments to new technologies. Examples of mechanisms to reduce conflict between technological change and current organization.

9.17 Johnson, Gerald E. "Better Decisions on Mechanizing," Factory, July 1959, pp. 62-67.

Cost types and sources, measuring and computing actual and alternative costs. Cost evaluation methods applied to four typical mechanization problems (1) system reliability, (2) scrap inventory, (3) startup costs, and (4) mechanization limits.

9.18 Lipstreu, Otis. "Personnel Management in the Automated Company," Personnel, March/April 1961, pp. 38-44.

Experiences of some large corporations and recommendations to improve personnel management in automated plants. Implications for skill levels, selection of employees, job structure, performance evaluation and financial incentives, employment, and labor relations.

9.19 Lowe, Robert A. "Cost Analysis and Machine Replacement," Automation, August 1959, pp. 46-56.

Implications of automatic manufacturing processes for cost analysis and methods of computing return on capital investment in current accounting practice.

9.20 McManus, G. J. "Automation Aims at Managers," Iron Age, February 25, 1960, pp. 28-29.

Effect of computers on management control at all levels of steel production.

9.21 Miller, Ben. "Look Beyond the Change; Introducing New Methods," Supervisory Management, February 1961, pp. 14-19.

Role of supervisor and suggestions for effective functioning in changeover to new operating methods. Problems of transfers, deadlines, excessive workloads, training, and older workers.

9.22 Morrow, L. C. "Managed Maintenance," Factory, January 1960, pp. 64-71.

Trends in maintenance organization, administration, skills, and technology.

9.23 Muschamp, George M. "Tomorrow's Integrated Offices and Plants,"Automation, May 1961, pp. 46-51.

Significance of linking industrial automatic control to office data processing. Evolution of integrated controls. Implications for management and need for higher grade personnel.

9.24 National Industrial Conference Board. Management's Role in Electronic Data Processing, Studies in business policy, No. 92 (New York, 1959). 64 pp.

Reasons for management participation, organizing for study and computer planning, evaluating proposed programs, approval of equipment contracts, computer department organization and employee relations, measuring results of computer programs, company experiences, and case studies.

9.25 National Office Management Association. "Automation Salary Survey," Office Management, March 1959, pp. 25-28.

9.26 Nett, Roger and Hetzler, Stanley A. An Introduction to Electronic Data Processing (Glencoe, Ill., The Free Press 1959). 287 pp.

History of electronic data processing, applications, and personnel problems surrounding adoption.

9.27 Newcomb, Robert and Sammons, Marg. "How to Sell Your Employees on Mechanization," Mill and Factory, May 1961, pp. 14-17.

Guidelines for management in explaining mechanization programs and effects, to allay workers' fears. Examples of company experiences with information programs and cushioning the impact of transfers, demotions, and separations.

9.28 Niland, Powell. "The Special Pitfalls of Investing in Special Automatic Equipment," Harvard Business Review, November/December 1957, pp. 73-82.

Comparison of average life expectancy, estimating investment requirements, degree of risk, and need for comparative analysis of conventional and automatic equipment.

9.29 Nolan, C. G. and Murrin, T. J. "Establishing an Automated Plant," Automation, January 1960, pp. 40-48.

Evaluation of economic, technical, and human factors (including personnel training) involved in planning and expediting Westinghouse facility expansion.

9.30 Parsons, Stuart O. and Wait, William B. "Automation and Personnel Inventory," Personnel Journal, April 1960, pp. 413-417.

Description of skill inventory procedures developed by a missile firm for locating and selecting personnel for specialized jobs, promotions, and transfers.

9.31 Postley, J. A. Computers and People: Business Activity in the New World of Data Processing (New York, McGraw-Hill, 1960). 246 pp.

Impact of computers on day-to-day activities of business people and persons closely associated with computers. Relationship of computers to business activities, fitting equipment to operations, new concepts of operation, decisionmaking, problems of transition, manufacturer's role, and outlook.

9.32 Purdue University. Third Conference on Manufacturing Automation, March 23-25, 1959. Cosponsored and published by Automation (Cleveland, 1959). 72 pp.

Papers by 13 business officials and engineers. Establishing, developing, and applying an automation program through organization and coordination of management functions, study of operations, developing hardware, data processing, and economic research. Implications for engineering, cost analysis, assembly, materials handling, distribution, and numerical and other controls.

9.33 Puutio, A. E. "Economics of Automation," Automation, March 1956, pp. 26-32.

Effects on accounting systems, design, production, and general business management.

9.34 Reid, Peter C. "Supervision in an Automated Plant," Supervisory Management, August 1960, pp. 2-10. Based on Automation and the Worker, by Floyd C. Mann and L. Richard Hoffman (New York, Holt, 1960). 272 pp. See 3.13.

Comparison of workers' attitudes in an old and a new electric power plant. Importance of supervisor's human relations skills in the automated plant. Discussion of worker motivation, job satisfaction, monotony, tension, dependence, isolation, and team work. Changes in skills, responsibility, job content, and training.

9.35 Ryan, James X. "Automation: Management Views," Tool Engineer, November 1956, pp. 77-79.

Implications for production cost, market potential, productivity, and education.

9.36 Schleh, Edward C. "Selling Technological Change as the Company's Way of Life," Personnel, July/August 1960, pp.57-66.

Making technological improvement personally advantageous to each employee. Avoiding layoffs, developing new skills, broader personnel planning and policy. Adjusting seniority and pensions to mobility. Pay and bonus systems as incentives to improvement. Personnel policies affecting attitudes of employees and management.

9.37 Shultz, George P. and Whisler, Thomas L., editors. Management Organization and the Computer; Proceedings, Seminar, sponsored by University of Chicago's Graduate School of Business, and the McKinsey Foundation (Glencoe, Ill., Free Press, 1960). 257 pp.

Essays and reports on company experience, by seven corporation managers and seven professors and researchers. Topics include the integration of men and machines into management systems, effects on staff line structure and role, technological feasibility and economic efficiency, and effects of computer-facilitated communications on decentralization.

9.38 Simon, Herbert A. "Management by Machines: How Much and How Soon," Management Review, November 1960, pp. 12-19 ff.

Predicted longrun effects of technical change and data processing on occupational structure, management supervision, decisionmaking, and organization, as well as social and psychological needs. Application of comparative advantage doctrine to automation. Man as a production resource, and computer potential in problem solving.

9.39 Slater, Robert E. "Conditioning Management for Machine Applications," Office Executive, November 1958, pp. 9-11 ff.

Implications of computer installations for managers. Impact on decisionmaking, organization, and personnel relations. Computer application and employee participation.

9.40 Stewart, Nathaniel. "Change Requires Employee Support," Nation's Business, August 1959, pp. 33; 37-59.

Building psychological foundations for employee acceptance of technological change through: employee identification with, and participation in change, reassurance of employees, communication with employees and emphasis on mutual interest of management and labor.

9.41 Thayer, Clarence H. "Applying an Automation Philosophy," Automation, January 1959, pp. 44-49.

Experiences of Sun Oil Co. management in designing and fitting automation systems into existing plants. Economic and organizational requirements. Techniques used to stimulate team effort, upgrade employee relations, avoid layoffs, and effects on future job opportunities.

9.42 "Timing Automation to Turnover," Factory Management and Maintenance, March 1957, pp. 96-97.

Use of normal employee attrition in a plant to take care of readjustments caused by new laborsaving equipment.

9.43 U.S. Small Business Administration. "Using Computer Services in Small Business," by I. J. Seligsohn (Management Aids for Small Manufacturers, Washington, November 1959). Help from Outside Series, No. 109, 4 pp.

Services available, representative business problems, and cost.

9.44 Weinberg, Edgar. Social Implications of Office Automation. Paper presented before 15th Annual Conference of the Association for Computing Machinery, Milwaukee, Wis., August 24, 1960 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1960). 12 pp.

Guidelines, based on BLS case studies of experiences with automation, for minimizing hardships through advanced planning, prior notice, transfer and retraining, reliance on attrition, recruitment from within, creation of new jobs, and use of older workers.

9.45 Worthman, L. H. and Lemelson, J. H. "Guideposts to Automation Planning," Automation, February 1958, pp. 52-56.

Relation of supplemental unemployment benefits to automation. Implications for product design, employee selection, maintenance, industrial engineering, collective bargaining, and management controls.

SECTION 10 - AUTOMATION IN FOREIGN COUNTRIES

Examples of developments and applications of automation in foreign plants and offices are presented in this section.

10.01 "Automation Dominates New Russian Tire Plant," Rubber Age, May 1960, pp. 272-278

10.02 "Automation in Russia--As Viewed by Soviet Engineers," American Machinist/Metalworking Manufacturing, March 21, 1960, pp. 125-132.

Summary of progress and problems in applying automation to manufacturing in the U.S.S.R., based on Soviet publications.

10.03 Blau, Paul F. "Office Automation in Austria," Trade Union Information, No. 24, 1959, pp. 18-25.

Extent of automation in office work and effects on workers in a Post Office, insurance company, glue works, and steel mill.

10.04 Canada, Department of Labor. The Current Status of Electronic Data Processing in Canada, Report No. 9A, issued by Interdepartmental Manpower Training Research Committee (Ottawa, December 1960). 30 pp.

Number and type of computers in use in Canada. Type and size of organization utilizing computers, and kinds of work done. Employment in new occupations and potential impact on employment.

10.05 Feyeux, M. and Farrough, M. "Productivity in European Railways," Productivity Measurement Review, August 1959, pp. 27-38.

Calculation of separate productivity ratios, each corresponding to a given input factor for nine main European railway networks over the years 1950-57.

10.06 Great Britain, Department of Scientific and Industrial Research. Automatic Control in Soviet Industry (London, 1959). 64 pp.

Progress of industrial application in the Soviet Union. Detailed accounts of work seen in various establishments by British engineering team in May 1959.

10.07 Henriksson, Arne. "A Swedish Approach to Automation," Free Labour World, August 1957, pp. 31-33.

Implications for productivity, role of unions, and developments in Sweden.

10.08 Kirchmayer, L. K. "U.S.S.R. Computer Use Growing," Electrical World, December 12, 1960, pp. 70-71.

Analysis of Russian developments in theories of computer power system control and application to plant and system control and use.

10.09 Klimenko, K. and Rakovsky, M. "The Technological and Economic Problems of Automation in the U.S.S.R.," International Social Science Bulletin, vol. 10, No. 1, 1958, pp. 44-54.

Problems of introducing automation in a planned economy. Effects on Soviet workers, skills, wages, education, and training.

10.10 Miller, W. E. "American Automation Expert Evaluates Russian Efforts," Steel, September 19, 1960, pp. 171-172.

Comments on Soviet developments in the iron and steel industry.

10.11 Oldenburger, Rufus. "Automatic Control Education in U.S.S.R.," Mechanical Engineering, October 1960, pp. 107-108.

Description of educational procedures, curriculum, and postgraduate work.

10.12 Southwell, Eric. Application of Automation in Europe (Paris, Trade Union Information and Research Service, European Productivity Agency, Organization for European Economic Cooperation. April 1958, Union Studies No. 12). 50 pp.

Study of a total of 33 plants in Great Britain, France, Holland, Belgium, and Germany. Economic and technical reasons for automation. Extent and nature of development in different industries; technical, social, and economic aspects.

10.13 U.N. Economic and Social Council. Automation; Report by the Executive Secretary. E/ECE/374. 15th sess., item 5c of the agenda (New York, March 3, 1960). 5 pp.

Report on meeting of experts convened in 1959 by the Executive Secretary. Development of automation in Europe, as of 1955-57. Problem of obtaining additional detailed case studies on economic aspects of automation, need for improved methods of reporting, and guide to types of information desirable.

10.14 U.N. Economic and Social Council, Economic Commission for Europe. Economic Implications of Automation, Annex II of Report on the Industry and Materials Committee E/ECE/334-G. 14th sess., item 4 of the agenda (New York, February 23, 1959). 48 pp.

Nature and growth of automation. Examples of economic effects based on case material from various countries: materials cost, raw materials input, energy consumption, unit cost, and cost of space, capital, and labor. Outline for case studies on economics of automation. Problems of determining automation efficiency and specialist training in the U.S.S.R. Selected case studies from the United Kingdom, U.S.S.R., and France.

10.15 "U.S. Expert Evaluates Soviet Computers," Chemical and Engineering News, August 1, 1960, pp. 48 ff.

Reports interview with Robert A. Brand of International Business Machines. Compares developments in the Soviet Union and the United States.

10.16 Walker, K. F., editor. Automation, Addresses to the Second Labor-Management Conference, University of Western Australia, October 27-28, 1956 (Perth, Australia, University of Western Australia Press, 1957). 93 pp.

Appraisal of overseas experience and implications for Australian industry. References to developments in the United States. Five papers on nature of automation and on economic, psychological, management, and labor problems. Three papers on labor-management contributions toward solution of the problems and on public policy aspects.

SECTION 11 - BIBLIOGRAPHIES

This section includes references to other recent bibliographies on automation.

11.01 American Library Association, Joint Committee on Library Service to Labor Groups. "Automation and Its Implications, 1956-60: A Selected Bibliography," Library Service to Labor, Spring 1961, Chicago, pp. 1-9.

Automation, in its general, economic, social, and industrial relations aspects, manpower and employment, office automation and bibliographies.

11.02 Association for Computing Machinery, Computing Reviews (New York, July/August 1961). 21 pp.

Contains reviews and abstracts of current publications in all areas of the computer sciences. Published bimonthly.

11.03 Cheek, Gloria. Economic and Social Implications of Automation: A Bibliographic Review. (East Lansing, Michigan State University, Labor and Industrial Relations Center, 1958). 125 pp.

Contains over 600 references, some annotated, on implications for manpower and employment, society and government, training and job requirements, human relations, collective bargaining, and management. Also items on general surveys, case studies and company experience, office automation and white-collar workers, and bibliographies.

11.04 Controllership Foundation, Inc. Business Electronics Reference Guide, Vol. 4, Peggy Courtney, editor (New York, 1958). 583 pp.

References to electronic computer installations and applications, commercial computing centers, training courses and programs, visual presentations, periodicals, pamphlets, proceedings, reports, and books.

11.05 European Coal and Steel Community, High Authority. Automation, 1949-1959 (Bibliography), Bibliographies de la Haute Autorite 19 (Luxembourg, 1959). 67 pp.

Items of a general nature, social and economic aspects, conferences, bibliographies, and periodicals. Text in various languages.

11.06 Goodman, L. Landon, "Bibliography of the Automatic Factory," Automation Today and Tomorrow (London, Oxford University Press, 1958), part 2, pp. 1-158.

Annotated bibliography of trends in 20 British industries and in the U.S.S.R. Management theory and techniques, trade unions and labor, economic and social implications, bibliographies, conferences, and films.

11.07 International Cooperation Administration, Office of Industrial Resources. Industrial Technical Library--A Bibliography (Washington, 1960). 263 pp.

Annotated listings of 3,000 books and periodicals on technology, automation, production, and engineering in selected industries; also on vocational, apprenticeship, and informal training; and on science, economics, sociology, politics, law, graphic arts, etc.

11.08 Mesics, Emil A. Training in Organizations: Business, Industrial, Government. Bibliography series No. 4 (Ithaca, N.Y., Cornell University, New York State School of Industrial and Labor Relations, October 1960). 77 pp.

Contains 356 annotated references on general training, orientation, work-skill training, technical training and education, supervisory and executive development, group participation techniques, audio-visual aids, and training evaluation.

11.09 National Science Foundation. Bibliography on the Economic and Social Implications of Scientific Research and Development, NSF 59-41 (Washington, U.S. Government Printing Office, July 20, 1959). 53 pp.

Lists 235 references on science and technology: nature, philosophy, and history; expenditure and manpower statistics; social and institutional framework and public policy; patents and invention; administration and management; economic and social implications; and other bibliographies.

11.10 National Science Foundation. Current Projects on Economic and Other Impacts of Scientific Research and Development, 1959, NSF 59-51 (Washington, U.S. Government Printing Office, 1959). 59 pp.

Survey of advanced postgraduate university projects underway, listed by author, giving title, institution, dates started and estimated completion, and annotation. Impact in selected industries and on industry location, administration, organization, personnel, agriculture, capital formation, automation, productivity, innovation, patents, and decision-making. New power sources; sociological, and manpower studies.

11.11 National Science Foundation. Current Projects on Economic and Social Implications of Scientific Research and Development, 1960, NSF 60-79 (Washington, U.S. Government Printing Office, 1960). 124 pp.

Expands 1959 survey coverage to nonprofit research organizations and to include impact on labor, scientific and engineering manpower, performance, education, and public policy and national defense. Contains 216 items.

11.12 U.S. Department of Labor, Bureau of Labor Statistics. Productivity: A Bibliography, Bull. 1226 (Washington, U.S. Government Printing Office, 1958). 182 pp.

Over 800 annotated references present technical and nontechnical descriptions of productivity measurement, factors which affect productivity, and the significance of productivity changes.

APPENDIX A - VISUAL AIDS ON AUTOMATION

1. "Automation," CBS Television. (Released by McGraw-Hill Book Co., 1957. 84 minutes, sound, black and white, 16 mm. From the CBS television program "See It Now.")

   Explores the many problems connected with automation and shows automation at work in many industries ranging from aviation to banking.

2. "Automation," Report from America, No. 6. U.S. Information Agency, 1956 (Made by National Broadcasting Co. Released for public educational use in the United States through U.S. Office of Education, 1958. 30 minutes, sound, black and white, 16 mm. and 35 mm.).

   Describes the nature and future of automation and implications for labor, management, industry, and politics. Includes interviews with John Diebold, Peter Drucker, Walter Reuther, and Wright Patman. Produced for overseas use.

3. "Automation and Mr. Halstead," General Electric Co., 1958 (Made by Raphael G. Wolff Studios. 28 minutes, sound, color, 16 mm.).

   Discusses the role of electrical equipment and technology in development of automation systems. Explains the need for keeping abreast of developments in electrical technology in order to recognize when automation becomes practical in given production problems. Describes the growing advantages of automation and the need for flexibility in automated processes.

4. "Automation on the Farm," U.S. Department of Agriculture, 1956 (6 minutes, sound, black and white, 16 mm.).

   Describes how automation has come to the farm and shows uses of power machines for lifting, chopping, hauling, etc. For television use.

5. "Automation Today," Mechanical Handling Systems (27 minutes, sound, black and white, 16 mm.).

   Motives and advantages of automation in production and processing. Suggestions on plant installations.

6. "Automation--What Is It?" Industry on Parade, No. 462. National Association of Manufacturers, 1959 (14 minutes, sound, black and white, 16 mm.).

Explains automation as the latest extension of industry's continuing development of improved manufacturing methods. Describes application of automation in a sawmill, in commercial mail handling, oil refining, lace manufacture, the telephone industry, and in farming.

7. "Have I Told You Lately That I Love You?" University of Southern California, Department of Cinema, 1958 (17 minutes, sound, 16 mm.).

A symbolic record of 1 day in the life of members of an upper middle-class American family, showing their dependence on machines and the effect of automation on their relationships with each other.

8. "Introduction to Automatic Data Processing," U.S. Department of the Army, 1958 (31 minutes, sound, black and white, 16 mm.).

Describes automatic data-processing systems, explaining underlying concept, capabilities, operations, and applications as a new management tool. Using animation, the film analyzes features, operations, and functional components. Shows several systems in use in Government installations. A problem is processed, for demonstration.

9. "Machines for a Land of Plenty--America's Farm Miracle," Visual Education Consultants, 1958 (Filmstrip, 36 frames, black and white, 35 mm., conservation series with teacher's guide).

Traces development of power machinery in the United States from the Civil War to the present. Explains how power machinery has revolutionized American farm methods and raised the Nation's standard of living.

10. "Massachusetts Institute of Technology: Automation," CBS Television, 1955 (Made by Information Productions. Released by Young America Films. 28 minutes, sound, black and white, 16 mm. Reduction print of the 35 mm. motion pictures made for the CBS television program "The Search." With film users' guide.)

Under the guidance of M.I.T. automatic control research engineers, describes a cross-country tour of laboratories pioneering in the development of robot machines designed to take over some of the duties once performed only by man. Discusses longrun effects on employment.

11. "Men and Machines," U.S. Economic Cooperation Administration, 1950 (Made by Wessex Film Productions, London. 15 minutes, sound, black and white, 16 mm. and 35 mm.).

Discusses relationship between individual craftsmanship and mass-production methods and explains necessity in Europe for using mass-production methods where quantity and low costs are prime considerations.

12. "The Nature of Work: The Skilled Worker," World in Action Series. National Film Board of Canada, Montreal (Released in the United States by McGraw-Hill Book Co., 1958. 30 minutes, sound, black and white, 16 mm.).

Considers the displacement of skilled workers by machines, telling the story of an immigrant from the Ukraine who, after coming to Canada, learned the machinist trade and acquired pride in craftsmanship. His world crumbled when the company installed automatic equipment to do work formerly done by machinists.

13. "Productivity, Key to Plenty," Encyclopaedia Britannica Films, 1949 (21 minutes, sound, black and white, 16 mm., with teacher's guide).

Traces development of machine power in the United States from 1850.

14. "The Pulse of Automation," Miletron Corporation (16 minutes, sound, color, 16 mm.).

Shows how pressure switches replace slow human sensory perception and reaction in effecting control; importance to automation.

15. "Technology and You," Neubacher Productions, 1959 (13 minutes, sound, color, 16 mm.).

Shows recent developments in technology and explains how they affect the life of the individual. Discusses vocations in technology and the importance of preparing for employment in the modern technological world.

16. "This Is Automation," General Electric Co., Apparatus Sales Division, 1956 (Made by Raphael G. Wolff Studios. 30 minutes, sound, color, 16 mm., Kodachrome).

Defines automation and gives illustrations of industrial applications in the manufacture and packaging of a variety of products.

17. "What Is Automation?" New York Journal-American. (Filmstrip. Made and released by Audio-Visual Materials Consultation Bureau, Wayne State University, Detroit, Mich., 1955. 36 frames, black and white, 35 mm., with discussion guide.)

Introduces the concept of automation, explaining it as an important factor in the planning of both industry and labor. Discusses some implications.

APPENDIX B - INDEX TO AUTHORS

The number to the left of the decimal indicates the section under which the reference is classified; the number to the right indicates the item under the section.

APPENDIX C - INDEX TO SUBJECTS

The number to the left of the decimal indicates the section under which the reference is classified; the number to the right indicates the item within the section.

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B

C

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W

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Isolation 6.15, 9.34
Safety 1.07, 1.22, 1.23, 6.11, 9.10
Tension 3.14, 8.21, 9.34

Y

Youth 5.09, 5.20, 5.24, 5.61, 7.43

APPENDIX D - LIST OF PERIODICALS AND PUBLISHERS

Action Society Trust
39 Welbeck St.
London, W.I., England

Administrative Management
(Formerly Office Management and American Business)
Geyer-McAllister Publications
Andrew Geyer-McAllister, Inc.
212 Fifth Ave.
New York 10, N.Y.

Administrative Science Quarterly
Graduate School of Business and Public Administration
Cornell University
Ithaca, N.Y.

Adult Education
Adult Education Association of the U.S.A.
743 North Wabash Ave.
Chicago 11, Ill.

Advanced Management
Society for the Advancement of Management, Inc.
74 Fifth Ave.
New York 11, N.Y.

AFL-CIO Collective Bargaining Report
American Federation of Labor and Congress of Industrial Organizations
815 16th St. NW.
Washington 6, D.C.

AFL-CIO Free Trade Union News
Department of International Affairs
1710 Broadway, Room 509
New York 19, N.Y. (and)
815 16th St. NW.
Washington 6, D.C.

America
American Press
920 Broadway
New York 10, N.Y.

American Bankers Association
12 East 36th St.
New York 16, N.Y.

American Child
National Committee on Employment of Youth
419 Fourth Ave.
New York 16, N.Y.

The American Economic Review
American Economic Association
540 Ahnaip St.
Menasha, Wis.

American Enterprise Association, Inc.
1012 14th St. NW.
Washington 5, D.C.

American Federation of Labor and Congress of Industrial Organizations
Department of Research (and)
Industrial Union Department
815 16th St. NW.
Washington 6, D.C.

The American Federationist
American Federation of Labor and Congress of Industrial Organizations
815 16th St. NW.
Washington 6, D.C.

American Journal of Economics and Sociology
50 East 69th St.
New York 21, N.Y.

American Machinist/Metalworking Manufacturing
(Prior to Feb. 8, 1960, American Machinist)
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

American Management Association
1515 Broadway, Times Square
New York 36, N.Y.

American Society of Mechanical Engineers
29 West 39th St.
New York 18, N.Y.

American Sociological Review
American Sociological Society
New York University, Washington Square
New York 3, N.Y.

American Statistical Association
1757 K St. NW.
Washington 6, D.C.

American Technical Society
Industrial Relations Center
University of Chicago
1225 East 60th St.
Chicago 37, Ill.

American Vocational Journal
American Vocational Association, Inc.
1010 Vermont Ave. NW.
Washington 5, D.C.

Annals of the American Academy of Political and Social Science
American Academy of Political and Social Science
3937 Chestnut St.
Philadelphia 4, Pa.

Antioch Review
Antioch Press
212 Xenia Ave.
Yellow Springs, Ohio

Armour Research Foundation of Illinois
Institute of Technology
Technology Center
Chicago 16, Ill.

Association of Supervisory Staffs, Executives, and Technicians
2-4 Homerton High St.
London, E. 9, England

The Atlantic
D. B. Snyder
8 Arlington St.
Boston 16, Mass.

Automation
The Penton Publishing Co.
Penton Bldg.
Cleveland 13, Ohio

Automotive Industries
Chilton Co.
Chestnut and 56th Sts.
Philadelphia 39, Pa.

Beacon Press, Inc.
25 Beacon St.
Boston 8, Mass. (and)
101 West 31st St.
New York 1, N.Y.

Bell Telephone Magazine
American Telephone and Telegraph Co.
Public Relations Department
195 Broadway
New York 7, N.Y.

Blast Furnace and Steel Plant
Steel Publications, Inc.
330 Grant St.
Pittsburgh 30, Pa.

The Brookings Institution
1775 Massachusetts Ave. NW.
Washington 6, D.C.

Brotherhood of Maintenance of Way Employees
12050 Woodward Ave.
Detroit 3, Mich.

Bulletin
Institute of Statistics
Oxford University
St. Cross Rd.
Oxford, England

Bureau of National Affairs, Inc.
1231 24th St. NW.
Washington 7, D.C.

Burroughs Clearing House
Burroughs Corp.
6071 Second Blvd.
Detroit 32, Mich.

Business Review
Federal Reserve Bank of Philadelphia
925 Chestnut St.
Philadelphia, Pa.

Business Week
McGraw-Hill Publishing Co, Inc.
330 West 42d St.
New York 36, N.Y.

Butterworth & Co, Ltd.
88 Kingsway
London, W.C., England
Available from: Butterworth, Inc.
7235 Wisconsin Ave.
Washington 14, D.C.

Cambridge University Press
Bentley House
200 Euston Rd.
London, N.W., England (and)
32 East 57th St.
New York 36, N.Y.

Canada, Department of Labour
Economics and Research Branch
Ottawa 4, Ont.
Canada

Challenge
Institute of Economic Affairs
New York University
475 Fifth Ave.
New York 17, N.Y.

Chamber of Commerce of the United States
1615 H St. NW.
Washington 6, D.C.

Chemical and Engineering News
American Chemical Society
1155 16th St. NW.
Washington 6, D.C.

Chemistry and Industry
Society of Chemical Industry
14 Belgrave Square
London, S.W. 1, England

Chilton Co.
Chestnut and 56th Sts.
Philadelphia 39, Pa.

Coal Age
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Columbia University Press
2960 Broadway
New York 27, N.Y.

Combustion
Combustion Publishing Co., Inc.
200 Madison Ave.
New York 16, N.Y.

Communications Workers of America
Education Department
Mercury Bldg.
Washington 6, D.C.

Computing Reviews
Association for Computing Machinery
14 East 69th St.
New York 21, N.Y.

The Conference Board Business Record
National Industrial Conference, Board, Inc.
460 Park Ave.
New York 22, N.Y.

Control Engineering
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Controllers Institute Research Foundation, Inc.
2 Park Ave.
New York 16, N.Y.

Controllership Foundation, Inc.
2 Park Ave.
New York 16, N.Y.

Cornell University
New York State School of Industrial and Labor Relations
Ithaca, N.Y.

Council for Technological Advancement
1200 18th St. NW.
Washington 6, D.C.

Current Economic Comment
Bureau of Economic and Business Research
University of Illinois
Box 658, Station A
Champaign, Ill.

Dun's Review and Modern Industry
Dun and Bradstreet Corp.
99 Church St.
New York 8, N.Y.

The Economic Journal
Royal Economic Society
21 Bentinck St.
London, W.I., England

Editorial Research Reports
1156 19th St. NW.
Washington, D.C.

The Electrical Workers' Journal
International Brotherhood of Electrical Workers
1200 15th St. NW.
Washington 5, D.C.

Electrical World
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Electro-Technology
(Prior to October 1960, Electrical Manufacturing)
Conover-Mast Publications, Inc.
205 East 42d St.
New York 17, N.Y.

Electronics
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Employment Security Review
Bureau of Employment Security, U.S. Department of Labor. Available from:
Superintendent of Documents
U.S. Government Printing Office
Washington 25, D.C.

Engineering Publishers
350 Morris Ave.
Elizabeth, N.J.
(Order from Reinhold Publishing Co. 430 Park Ave., New York 22, N.Y.)

European Coal and Steel Community, High Authority
2 Place de Metz
Luxembourg
Available from: European Community Information Service
236 Southern Bldg.
Washington 5, D.C.

Factory
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Factory Management and Maintenance
(Name changed to Factory, January 1959)

Food Engineering
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Fortune
Time, Inc.
540 North Michigan Ave.
Chicago, Ill.

Foundation for Research on Human Behavior
1141 East Catherine St.
Ann Arbor, Mich.

Foundry
The Penton Publishing Co.
Penton Bldg.
Cleveland 13, Ohio

Foundry Marketing Guide
The Penton Publishing Co.
Penton Bldg.
Cleveland 13, Ohio

Free Labour World
International Confederation of Free Trade Unions
24 Rue du Lombard
Brussels, Belgium

The Free Press of Glencoe, Inc.
60 Fifth Ave.
New York 11, N.Y.

Graphic Arts Monthly and the Printing Industry
The Graphic Arts Publishing Co.
608 South Dearborn St.
Chicago 5, Ill.

Great Britain, Department of Scientific and Industrial Research
Charles House, 5-11 Regent St.
London, S.W.1, England

Harper & Brothers
49 East 33d St.
New York 16, N.Y.

Harper's Magazine
Harper & Brothers
49 East 33d St.
New York 16, N.Y.

Harvard Business Review
Graduate School of Business Administration
Harvard University
Gallatin House, Soldiers Field
Boston 63, Mass.

Harvard University
Graduate School of Business Administration
Soldiers Field
Boston 63, Mass.

Harvard University Press
Publishing Department
Kittredge Hall
79 Garden St.
Cambridge 38, Mass.

Her Majesty's Stationery Office
Box 569
London, S.E.1, England
Available from: British Information Services
45 Rockefeller Plaza
New York 20, N.Y.

Holt, Rinehart, & Winston, Inc.
383 Madison Ave.
New York 17, N.Y.

Houghton Mifflin Co.
(Riverside Press, Cambridge)
2 Park St.
Boston 7, Mass.

ILR Research (Industrial and Labor Relations)
Distribution Center
New York State School of Industrial and Labor Relations
Cornell University
Ithaca, N.Y.

Impact of Science on Society
United Nations Educational, Scientific and Cultural Organization
19 Ave. Kleber
Paris-16e, France
Available from: Unesco Publications Center
152 West 42d St.
New York 36, N.Y.

Industrial and Labor Relations Review
New York State School of Industrial and Labor Relations
Cornell University
Ithaca, N.Y.

Industrial Bulletin
New York State Department of Labor
State Office Bldg.
Albany 1, N.Y.

Industrial Medicine and Surgery
Industrial Medicine Publishing Co.
605 North Michigan Ave.
Chicago 11, Ill.

Industrial Relations Research Association
Sterling Hall
University of Wisconsin
Madison 6, Wis.

Institute of Industrial Relations
University of California
Business Administration-Economics Building
Los Angeles 24, Calif. (and)
201 California Hall
Berkeley, Calif.

Institute of Radio Engineers
1 East 79th St.
New York 1, N.Y.

Instruments and Control Systems
Instruments Publishing Co., Inc.
845 Ridge Ave.
Pittsburgh 12, Pa.

International Association of Machinists
Research Department
1300 Connecticut Ave.
Washington 6, D.C.

International Cooperation Administration
Office of Industrial Resources
Washington 25, D.C.

International Labor Office
Editorial Division
Geneva, Switzerland
(Washington Branch Office)
917 15th St. NW.
Washington 5, D.C.

International Labour Review
International Labor Office
Editorial Division
Geneva, Switzerland
Available from: Washington Branch Office
917 15th St. NW.
Washington 5, D.C.

International Longshoremen's and Warehousemen's Union
150 Golden Gate Ave.
San Francisco, Calif.

International Publishers Co., Inc.
381 Park Ave. South
New York 16, N.Y.

International Social Science Bulletin
Department of Social Sciences
Unesco
19 Ave. Kleber
Paris-16e, France
Available from: Unesco Publications Center
801 Third Ave.
New York 22, N.Y.

Interscience Publishers, Inc.
250 Fifth Ave.
New York 1, N.Y.

The Iron Age
Chilton Co.
Chestnut and 56th Sts.
Philadelphia 39, Pa.

I.S.A. Journal
Instrument Society of America
313 Sixth Ave.
Pittsburg 22, Pa.

I.U.D. Digest
Industrial Union Department, AFL-CIO
815 16th St. NW.
Washington 6, D.C.

The Johns Hopkins Press
Homewood
Baltimore 18, Md.

Joint Council on Economic Education
2 West 46th St.
New York 36, N.Y.

Journal of the American Society of Training Directors
American Society of Training Directors
2020 University Ave.
Madison 5, Wis.

Journal of Applied Psychology
American Psychological Association
1333 16th St. NW.
Washington 6, D.C.

Journal of Business
Graduate School of Business
University of Chicago
University of Chicago Press
5750 Ellis Ave.
Chicago 37, Ill.

The Journal of Commerce
80 Varick St.
New York 13, N.Y.

The Journal of Industrial Economics
Basil Blackwell
Oxford, England

The Journal of Marketing
American Marketing Association
27 East Monroe St.
Chicago 3, Ill.

Journal of Retailing
New York University School of Retailing
1010 Main Bldg.
Washington Square
New York 3, N.Y.

The Journal of Social Issues
The Society for the Psychological Study of Social Issues
Association Press
291 Broadway
New York 7, N.Y.

Labor Law Journal
Commerce Clearing House, Inc.
4025 West Peterson Ave.
Chicago 46, Ill.

Labor Market and Employment Security
U.S. Department of Labor
Bureau of Employment Security
Available from: U.S. Government Printing Office
Washington 25, D.C.

Library Service to Labor
American Library Association
50 East Huron St.
Chicago, Ill.

Liverpool University Press
123 Grove St.
Liverpool 7, England

Machine Design
Penton Publishing Co.
Penton Bldg.
Cleveland 13, Ohio

Management and Business Automation
Office Appliance Co.
600 West Jackson Blvd.
Chicago 6, Ill.

Management Review
American Management Association, Inc.
1515 Broadway
New York 36, N.Y.

McGraw-Hill Book Co., Inc.
330 West 42d St.
New York 36, N.Y.

Mechanical Engineering
American Society of Mechanical Engineers
29 West 39th St.
New York 18, N.Y.

Michigan State University
Labor and Industrial Relations Center
East Lansing, Mich.

Michigan State University Press
Box 752
East Lansing, Mich.

Mill & Factory
Conover-Mast Publications, Inc.
205 East 42d St.
New York 17, N.Y.

The Mining Congress Journal
American Mining Congress
1102 Ring Bldg.
Washington 6, D.C.

Monthly Labor Review
U.S. Department of Labor, Bureau of Labor Statistics
Available from: Superintendent of Documents
U.S. Government Printing Office
Washington 25, D.C.

The Nation
333 Sixth Ave.
New York 14, N.Y.

National Academy of Sciences
2101 Constitution Ave. NW.
Washington 25, D.C.

National Association of Manufacturers
Research Department
2 East 48th St.
New York 17, N.Y.

National Industrial Conference Board
460 Park Ave.
New York 22, N.Y.

National Office Management
Association
1927 Old York Rd.
Willow Grove, Pa.

National Planning Association
1606 New Hampshire Ave. NW.
Washington 9, D.C.

National Retail Merchants Association
Retail Research Institute
100 West 31st St.
New York 1, N.Y.

National Science Foundation
1951 Constitution Ave. NW.
Washington 25, D.C.

Nation's Business
Chamber of Commerce of the
United States
1615 H St. NW.
Washington 6, D.C.

The New American Library of World
Literature, Inc.
501 Madison Ave.
New York 22, N.Y.

New Republic
1244 19th St. NW.
Washington 6, D.C.

New York City Central Labor Council
386 Park Ave.
New York, N.Y.

New York State Department of Labor
State Office Bldg.
Albany, N.Y.

The New York Times
The New York Times Co.
229 West 43d St.
New York 36, N.Y.

W. W. Norton and Co., Inc.,
Publishers
55 Fifth Ave.
New York 3, N.Y.

Office Executive
National Office Management
Association
1927 Old York Rd.
Willow Grove, Pa.

Office Management
Geyer-McAllister Publications
212 Fifth Ave.
New York 10, N.Y.

Office Management and American
Business
(Name changed to Administrative
Management)

Oil and Gas Journal
Petroleum Publishing Co.
211 South Cheyenne Ave.
Tulsa 3, Okla.

Organization for European
Economic Co-operation
European Productivity Agency
2, Rue Andre-Pascal
Paris-16^{e}, France

Oxford University Press
Amen House, Warwick Square
London, E.C. 4, England (and)
417 Fifth Ave.
New York 16, N.Y.

Paper Industry
Fritz Publications, Inc.
431 Dearborn St.
Chicago 5, Ill.

Paper Mill News
L.D. Post, Inc.
1440 Broadway
New York 18, N.Y.

Patent, Trademark, and Copyright Journal of Research and Education
The Patent, Trademark, and Copyright Foundation
George Washington University
708 22d St. NW.
Washington 6, D.C.

Penguin Books, Ltd.
Bath Rd.
Harmondsworth, Middlesex
England (and)
Penguin Books, Inc.
3300 Clipper Rd.
Baltimore 11, Md.

Pennsylvania Business Survey
Bureau of Business Research
229 Boucke Bldg.
Pennsylvania State University
University Park, Pa.

Personnel
The American Management Association
1515 Broadway, Times Square
New York 36, N.Y.

Personnel Administration
Society for Personnel Administration
715 G St. NW.
Washington 1, D.C.

Personnel Administrator
American Society for Personnel Administration
3735 Indian Rd.
Toledo, Ohio

Personnel and Guidance Journal
American Personnel and Guidance Association
1605 New Hampshire Ave. NW.
Washington 9, D.C.

Personnel Journal
The Personnel Journal, Inc.
P.O. Box 239
Swarthmore, Pa.

Petroleum-Engineer for Management
Petroleum Engineer Publishing Co.
800 Davis Bldg.
Dallas 2, Tex.

Philosophical Library
15 East 40th St.
New York 16, N.Y.

Pittsburgh Business Review
2117 CL, University of Pittsburgh
Bureau of Business Research
Graduate School of Business
Pittsburgh 13, Pa.

Political and Economic Planning
16 Queen Anne's Gate
London S.W.I., England

Power Engineering
308 East James St.
Barrington, Ill.

Frederick A. Praeger, Inc.
64 University Pl.
New York 3, N.Y.

Prentice-Hall, Inc.
Route 9 W
Englewood Cliffs, N.J.

Princeton University
Department of Economics & Sociology
Industrial Relations Section
Princeton, N.J.

Princeton University Press
Princeton, N.J.

Productivity Measurement Review
Productivity Advisory Service
European Productivity Agency
Available from: O.E.E.C. Mission
Publications Office
Suite 1223
1346 Connecticut Ave. NW.
Washington 6, D.C.

Public Administration Review
American Society for Public Administration
6042 Kimbark Ave.
Chicago 37, Ill.

Public Affairs Press
419 New Jersey Ave. SE.
Washington 3, D.C.

Public Personnel Review
Public Personnel Association
1313 East 60th St.
Chicago 37, Ill.

Railway Age
Simmons-Boardman Publishing Corp.
30 Church St.
New York 7, N.Y.

Reinhold Publishing Corp.
430 Park Ave.
New York 22, N.Y.

Religion and Labor Foundation
(Name changed in 1959 to Religion and Labor Council of America)
3498½ North High St.
Columbus 14, Ohio

The Reporter
660 Madison Ave.
New York 21, N.Y.

Retail Clerks International Association
Connecticut Ave. and DeSales St. NW.
Washington 6, D.C.

Rubber Age
Palmerton Publishing Co.
101 West 31st St.
New York 1, N.Y.

Rutgers University
Institute of Management and Labor Relations
New Brunswick, N.J.

The Saturday Evening Post
Curtis Publishing Co.
Independence Square
Philadelphia 5, Pa.

School Shop
330 Thompson St.
Ann Arbor, Mich.

Science
American Association for the Advancement of Science
1515 Massachusetts Ave. NW.
Washington 5, D.C.

Scientific American
415 Madison Ave.
New York 17, N.Y.

Martin Secker & Warburg, Ltd.
7 John St.
Bloomsbury, London, W.C.I.
England

Sidgewick & Jackson, Ltd.
1 Tavistock Chambers
Bloomsbury Way
London, W.C.I., England

Simon and Schuster, Inc.
630 Fifth Ave.
New York 20, N.Y.

The Smithsonian Institution
10th St. and Independence Ave. SW.
Washington 25, D.C.

Social Problems
Society for the Study of Social Problems
Indiana University
Bloomington, Ind.

Sociology and Social Research
University of Southern California Press
University Park
Los Angeles 7, Calif.

Southern Research Institute
2000 Ninth Ave.
Birmingham, Ala.

Stanford Research Institute
Public Relations Department
Menlo Park, Calif.

Steel
The Penton Publishing Co.
Penton Bldg.
Cleveland 13, Ohio

Steel Labor
United Steelmakers of America
2457 East Washington St.
Indianapolis 7, Ind.

Supervisory Management
American Management Association
1515 Broadway
New York 36, N.Y.

Tappi
Technical Association of the Pulp and Paper Industry
360 Lexington Ave.
New York 17, N.Y.

Technical Education News
American Technical Education Association
22 Oakwood Pl.
Delmar, N.Y.

Textile Industries
W.R.C. Smith Publishing Co.
806 Peachtree St. NE.
Atlanta 8, Ga.

Textile World
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N.Y.

Textile Workers Union of America
Research Department
99 University Pl.
New York 3, N.Y.

Tool and Manufacturing Engineer
(Prior to September 1960, Tool Engineer)
American Society of Tool Engineers
10700 Puritan Ave.
Detroit 38, Mich.

Tool Engineer
(Name changed to Tool and Manufacturing Engineer, September 1960)

Tooling and Production
Huebner Publications, Inc.
1975 Lee Rd.
Cleveland 18, Ohio

Trade Union Information
European Productivity Agency
Trade Union Section
3 Rue Andre-Pascal
Paris-16e, France

Trade Union Information and
Research Service
European Productivity Agency
Organization for European Economic
Co-operation
3 Rue Andre-Pascal
Paris-16e, France

Trains
Kalmbach Publishing Co.
1027 North Seventh St.
Milwaukee 3, Wis.

United Nations Educational,
Scientific, and Cultural
Organization
2 Place de Fontenoy
Paris-7e, France
Available from: UNESCO Publications
Center
801 Third Ave.
New York 22, N.Y. (and except
for periodicals)
International Document Service
Columbia University Press
2960 Broadway
New York 27, N.Y.

U.S. Bureau of the Budget
Washington 25, D.C.

U.S. Civil Aeronautics Board
Washington 25, D.C.

U.S. Department of Agriculture
Agriculture Research Service (and)
Agricultural Marketing Service
Washington 25, D.C.

U.S. Department of the Army
Ballistics Research Laboratories
Aberdeen Proving Ground, Md.

U.S. Department of Commerce
Business and Defense Services
Administration
Washington 25, D.C.

U.S. Department of the Interior
Bureau of Mines
Washington 25, D.C.

U.S. Department of Labor
Bureau of Employment Security (and)
Bureau of Labor Statistics (and)
Bureau of Apprenticeship and
Training
Washington 25, D.C.

U.S. General Accounting Office
Washington 25, D.C.

U.S. Government Printing Office
Superintendent of Documents
Washington 25, D.C.

U.S. News and World Report
United States Publishing Corp.
2300 N St. NW.
Washington 7, D.C.

U.S. Small Business Administration
Washington 25, D.C.

University of Alabama Press
Drawer 2877
University, Ala.

University of Illinois
College of Commerce and Business
Administration
Bureau of Economic and Business
Research
Box 658, Station A
Champaign, Ill.

University of Illinois
Institute of Labor and Industrial Relations
Editorial Office
704 South Sixth St.
Champaign, Ill.

University of Illinois Bulletin
University of Illinois
Office of Publication
207 Administration Bldg.
Urbana, Ill.

University of Minnesota
Industrial Relations Center
Minneapolis, Minn.

University of Oklahoma Press
Faculty Exchange
Norman, Okla.

University of Southern California
Department of Psychology
Los Angeles, Calif.

University of Western Australia Press
Nedlands, Western Australia

D. Van Nostrand Co., Inc.
120 Alexander St.
Princeton, N.J.

The Viking Press, Inc.
625 Madison Ave.
New York 22, N.Y.

Wadsworth Publishing Co., Inc.
431 Clay St.
San Francisco 11, Calif.

Wall Street Journal
Dow-Jones and Co., Inc.
44 Broad St.
New York 4, N.Y.

West Virginia University Institute of Industrial Relations
Morgantown, W. Va.

John Wiley and Sons, Inc.
440 Fourth Ave.
New York 16, N.Y.

World Health Organization
Geneva, Switzerland
Publications available from:
Columbia University Press
International Documents Service
2960 Broadway
New York 27, N.Y.

Yale University Press
143 Elm St.
New Haven, Conn. (and)
386 Fourth Ave.
New York 16, N.Y.

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