Bulletin No. 1226

Productivity: A Bibliography

November 1957

JNITED STATES DEPARTMENT OF LABOR
lames P. Mitchell, Secretary

)UREAU OF LABOR STATISTICS
:wan Clague, Commissioner

Productivity: A Bibliography

November 1957

Bulletin No. 1226

UNITED STATES DEPARTMENT OF LABOR
James P. Mitchell, Secretary

BUREAU OF LABOR STATISTICS
Ewan Clague, Commissioner

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. - Price . . . $1

CONTENTS

CONTENTS--Continued

APPENDIXES

PREFACE

The role of productivity in America's great industrial growth has long been acknowledged, and research, measurement and analysis of productivity have been conducted by the U. S. Department of Labor's Bureau of Labor Statistics ever since its founding. Others too have studied and written about this vital subject so that the literature in the field has become quite extensive. In recent years, the key position of productivity in economic growth and projection seems to be receiving more and more attention. However, much work still remains to be done in the field of productivity—in its measurement, analysis, and interpretation. This bibliography is presented for economists in government or private industry, union and management officials, labor relations analysts, teachers, and students, to help them make use of the growing volume of published material on this subject.

This bibliography was prepared in the Bureau's Division of Productivity and Technological Developments by Laura H. Spatz under the general direction of Allan D. Searle and Maurice Haven. The Bureau gratefully acknowledges the assistance of members of the staff of the Department of Labor Library and the Library of Congress.

Leon Greenberg, Chief
Division of Productivity and
Technological Developments

PRODUCTIVITY: A BIBLIOGRAPHY

Introduction

Scope and Limitations

To the economist, the concept of productivity implies the ratio of output to the input of all factors. Such factors would include labor, capital, land, fuel, etc. However, most of the literature on productivity relates production to the input of labor. References in this bibliography have been generally limited to this measure of productivity, although some of them do discuss other types of input factors in addition to labor input.

Also excluded from the bibliography is literature relating to time and motion studies at the job level, and to the field of psychology dealing with aptitudes and individual differences. Although it cannot be doubted that such factors influence productivity change, these studies rightfully belong in other scientific areas.

Many sources were searched in compiling the bibliography, including the files of the Bureau's Division of Productivity and Technological Developments, the Department of Labor Library, and the Library of Congress. The Cumulative Book Index, the Industrial Arts Index, the Readers Guide to Periodicals, and the Public Affairs Information Service were consulted for listings of books and periodical articles on the subject.

No specific date has been selected as a starting point for this bibliography. The sources listed above were covered thoroughly from 1953 to June 1957, but listings from earlier bibliographies published by the Bureau in 1946 and 1952 1/ are included here. In general, no attempt has been made to include

---

1/ Selected references on Productivity, U. S. Department of Labor, Bureau of Labor Statistics, October 1946; and Selected References on Productivity Published in the United States, September 1946-September 1952, U. S. Department of Labor, Bureau of Labor Statistics, October 1952.

news items on the subject, published in the daily press. However, some signed articles from newspapers were included, where the subject matter was considered to be sufficiently important.

The references in this bibliography are from (1) periodical articles, books, reports, speeches, pamphlets, conference proceedings, and theses prepared or published in the United States; (2) references published by such international agencies as the Organization for European Economic Cooperation (OEEC), the Inter-American Statistical Institute, and the International Labor Office; and (3) articles from foreign periodicals referring to productivity in the United States. Every effort has been made to cover groups (1) and (2) as completely as possible. However, references in group (3) are only those which have been brought to the attention of the compilers of this bibliography.

There are nearly 900 references listed, presenting technical and nontechnical descriptions of productivity measurement, factors which affect productivity, and the significance of productivity changes. With the exceptions noted below, each reference includes a brief annotation giving the gist of the subjects covered. However, no evaluation of the references included is intended.

Although efforts have been made to cover the subject completely, it is possible that because of the large volume of material published in recent years, some important references may have been omitted. Omissions that are brought to the Bureau's attention will be incorporated in future revised editions or supplements of this publication.

Using the Bibliography

References in the subject matter section of the bibliography have been classified under 11 broad subdivisions. When a reference relates to more than one subdivision, it is listed only once, under the division to which a major portion of the article, book, etc., relates.

The section Industry and Sector Measures deals primarily with empirical measures of productivity and various industries and sectors of the economy. It shows trends in productivity over a period of time for groups of industries, or a sample of plants in a particular industry. These studies are

sometimes based on field studies made to obtain information on productivity changes, or are prepared from data on production and labor collected for other purposes. Some material may also be included on factors and projections as applied to specific industries or sectors. Entries whose major contribution is in the field of methodology, even though confined to a particular industry, are listed in the section, Concept and Measurement. Information on productivity levels within a particular plant or firm, usually based on case studies, are included in the section Productivity at the Plant Level.

References included in the section International are largely entries which compare productivity in the United States with those in other countries but also contain American publications pertaining to single foreign countries.

There are obviously a great number of factors which influence productivity, and in turn have an effect on practically every aspect of the economy. These entries under the sections Factors Affecting Productivity and Significance of Productivity Change are necessarily limited to studies which discuss directly those factors which cause productivity change, and the impact of such changes on various segments of the economy. Studies dealing with the relationship of productivity to economic growth are found in the section Productivity and the Economy.

Trade union attitudes toward productivity, collective bargaining and productivity are covered in the section Productivity and Labor-Management Relations. This section overlaps, unavoidably, with the section on Productivity, Wages, and Prices which deals primarily with the relationship between productivity, and wages and prices.

The vast amount of literature on subjects such as technological change, 2/ the growth of capital equipment, prices and wages, labor-management relationships, etc., all of which influence productivity change, are not included in the bibliography unless they are discussed in connection with productivity change.

2/ Many of the technological changes in the area referred to as automation are presented in Automatic Technology and Its Implications, A Selected Annotated Bibliography, BLS Bulletin No. 1198, August 1956.

The section Bibliographies contains several references published outside the United States.

The section College Doctoral Dissertations and Theses contains titles of unpublished works only. No annotations are included with the references listed in this section. Theses which have been published are listed in the bibliography in accordance with their subject matter. The references here are either on file at the Library of Congress or at the college which issued the degree.

Users of the bibliography should write directly to the periodical or publisher for any item cited. The Bureau of Labor Statistics has only reprints of articles, etc., except those prepared in the Bureau itself.

During the compilation of this bibliography, if it was found that a reference was no longer in print, the notation "o.p." was included with the annotation.

SECTION I

INDUSTRY AND SECTOR MEASURES

(The references in this section deal primarily with empirical measures of productivity and various industries and sectors of the economy. Some material may also be included on factors and projections as applied to specific industries or sectors.)

A. Total Economy and Sectors or Industries

1.001. Changes in Physical Production, Industrial Productivity and Manufacturing Costs, 1927-1932. Frederick C. Mills. New York: National Bureau of Economic Research, February 20, 1933, Bull. No. 45 (6 pp.).

Presents trends in manufacturing, mining, and agriculture, 1927-1932.

1.002. The Changing Efficiency of the American Economy, 1869-1938. Jacob Schmookler. Review of Economics and Statistics, August 1952 (pp. 214-231).

The pattern and magnitude of technical change for selected industries in the United States as a whole from 1869 to 1938. An index of output per unit of total input.

1.003. Estimates of Gross National Product in Constant Dollars, 1929-49. George Jaszi and John W. Kendrick. U. S. Department of Commerce, Survey of Current Business, January 1951, Vol. 31, No. 1 (pp. 6-11).

Included are estimates of the rate of growth of overall productivity in the private sector of the economy.

1.004. Hand and Machine Labor. Carroll D. Wright. U. S. Department of Labor, Bureau of Labor Statistics, 1899, 2 Vols. (2030 pp.). (13th Annual Report of the Commissioner of Labor, 1898).

The relative productive power and cost of hand and machine labor, and the effect of the introduction of machines upon the labor force.

1.005. The Industrial Study of Economic Progress. Hiram S. Davis. Philadelphia: University of Pennsylvania Press, 1947 (187 pp.).

Includes studies on productive efficiency and productivity changes in particular industries.

1.006. Labor Productivity and Labor Cost. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1941 (pp. 1388-1391).

Indexes for 1939 to 1941 for production, man-hours, and output per man-hour in manufacturing, coal mining, and railroads. A revision and extension of data in the article "Wages, Hours, and Productivity of Industrial Labor, 1909 to 1939" by Witt Bowden in the Monthly Labor Review, September 1940.

1.007. Labor Savings in American Industry, 1899-1939. Solomon Fabricant. New York: National Bureau of Economic Research, November 1945, Occasional Paper No. 23 (52 pp.).

Trends of output and productivity for all manufacturing, individual manufacturing industries, agriculture, mining, and public utilities. The relationship between increase in productivity and national product per capita.

1.008. Manufacturing Investment Since 1929 in Relation to Employment, Output and Input. Donald G. Wooden and Robert C. Wasson. Survey of Current Business, November 1956 (pp. 8-20).

Includes trends in labor and capital per unit of output, 1929-55.

1.009. New Surge in Productivity: Fortune, December 1956 (p. 33).

Trend table for manufacturing and nonfarm productivity, 1952-56.

1.010. Output per Man-Hour and Unit Man-Hour Requirements, 1909-1950, U. S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1950 Edition, Bull. No. 1016, Section F (pp. 166-174).

Indexes for selected manufacturing, nonmanufacturing industries and agriculture.

1.011. Output per Man-Hour in Selected Nonmanufacturing Industries. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1956 (pp. 177-181).

Physical output per man-hour in 6 nonmanufacturing industries, 1947-54.

1.012. Output per Man-Hour in 27 industries, 1950. Allan D. Searle and Enzo A. Puglisi. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1951 (pp. 422-424).

Indexes of output per man-hour for 1949 and 1950 for 20 manufacturing industries, 5 mining industries, 1 transportation industry, and agriculture.

1.013. Postwar Productivity Growth in the United States. Paper presented at International Conference on productivity, Paris, France. U. S. Department of Labor, Bureau of Labor Statistics. April 1957 (35 pp.).

Basic factual data with analysis of productivity trends and factors affecting these changes.

1.014. Potential Economic Growth of the United States During the Next Decade. Materials prepared for the Joint Committee on the Economic Report, 1954 (35 pp.).

Includes a table showing private nonagricultural and agricultural output per man-hour and per capita.

1.015. Productivity: Past and Present. Labor Cost and Inflation, 41st annual meeting, National Industrial Conference Board, May 16, 17, 1957 (pp. 16-17).

Analysis of productivity changes for farm, private nonfarm and manufacturing, 1909-56).

1.016. Productivity Changes Since 1939. Celia Star Gody and Allan D. Searle. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1946 (pp. 893-917).

Indexes of output per man-hour for selected manufacturing and nonmanufacturing industries, and factors affecting productivity.

1.017. Productivity in Nonmanufacturing (U. S. since 1939). Gertrude Deutsch. National Industrial Conference Board, Conference Board Business Record, July 1950, Vol. 7 (pp. 274-278).

Trends for agriculture, railroads, electric light and power, telephone and telegraph, and mining.

1.018. Productivity on the Increase. H. E. Hansen. National Industrial Conference Board, Conference Board Business Record, June 1948, Vol. 5 (pp. 242-245).

Business practices and productivity trends for individual industries.

1.019. Productivity Trends: Capital and Labor. John W. Kendrick. National Bureau of Economic Research, January 1956 (24 pp.). Presented at joint session of the American Economic Association and the American Statistical Association on December 29, 1955. Also in Review of Economics and Statistics, August 1956 (pp. 248-257).

Productivity trends since the turn of the century in the American economy, by major segments and industries.

1.020. Productivity Trends in American Industries. U. S. Department of Labor, Bureau of Labor Statistics, January 1946 (18 pp.).

Charts: Trends in manufacturing, 1909-39; and for mining, railroad transportation, electric light and power, agriculture, and airframe manufacture, 1909-44.

1.021. Productivity Trends in Selected Industries: Indexes Through 1950. Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, Bull. No. 1046, 1951 (83 pp.).

Current changes in productivity, and historical trends for selected industries with technical notes.

1.022. Productivity, United States by Decades, 1891-1950. Weekly Chart Service, Road Maps of Industry, No. 905, May 1, 1952. The National Industrial Conference Board.

Charts on Gross National Product, population, total man-hours of labor input and output per man-hour are based on "Productivity and Economic Progress," by Frederick C. Mills. New York: National Bureau of Economic Research, 1952.

1.023. Recent Productivity Trends. Ewan Clague. Summary of address before the 1952 Industrial Engineering Conference, sponsored by the Chicago Chapter of the Society for Advancement of Management, September 11, 1952. U. S. Department of Labor, Bureau of Labor Statistics. September 1952 (3 pp.).

Review of productivity changes, 1939-1951 for total manufacturing and nonmanufacturing industries and for selected manufacturing industries.

1.024. Recent Trends in Productivity in the American Economy. U. S. Department of Labor, Bureau of Labor Statistics. Summary of Proceedings of Conference on Productivity, June 10, 1948 (34 pp.).

Principal topics and speakers: History of the Productivity Conference, Solomon Fabricant; Trends in Gross National Product and Employment, John W. Kendrick; Productivity Changes in Agriculture, Glen T. Barton; Productivity in Bituminous Coal Mining, W. H. Young; Work of the BLS in the Productivity Field, W. Duane Evans; Productivity in Nonmanufacturing Industries--Indexes based on Secondary Data, Allan D. Searle; The Direct Reports Program, George E. Sadler; Findings of the National Industrial Conference Board, Martin Gainsbrugh; Comparison of Productivity in 1947 with 1941 and Recommendations, Hiram S. Davis.

1.025. Resource and Output Trends in the United States Since 1870. Moses Abramovitz. Papers presented at the Sixty-eighth Annual Meeting of the American Economic Association, New York City, December 28-30, 1955. American Economic Review, May 1956, Vol. 46, No. 2 (pp. 5-34).

The average productivity of various factors of our economy estimated from an accumulation of historical statistics.

1.026. Trends in Output and Employment. George J. Stigler. New York: National Bureau of Economic Research, 1947 (67 pp.).

Analyzes output employment, and output per worker from 1899 to 1939 in manufacturing, agriculture, mining, gas and electric utilities, and steam railroads.

1.027. Trends in Output per Man-Hour, Selected Nonmanufacturing Industries; 1935-55. U. S. Department of Labor, Bureau of Labor Statistics, June 1956, BLS Report No. 105 (21 pp.).

Extends statistics presented in previously published reports for selected nonmanufacturing industries.

1.028. Trends in Technology and Employment. No. 1 of a Series on Technology and Employment. Washington: Council for Technological Advancement, May 1954 (24 pp.).

Recent trends in manufacturing, service, trade and other industries, and a forecast of the effect of America's advancing technology on future employment.

1.029. Wages, Hours, and Productivity of Industrial Labor. Witt Bowden. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1940 (pp. 517-544).

Data for manufacturing, mining, and steam railroads, 1909-39.

B. Agriculture

1.030. American Agriculture, 1899-1939, A Study of Output, Employment and Productivity. Harold Barger and Hans H. Landsberg. New York: National Bureau of Economic Research, Inc., 1942 (435 pp.).

Indexes for the total net output of agriculture, employment and output per gainfully employed worker, 1899-1939. Technological advance in farm machinery and developments in plant improvement and animal breeding, and the distribution of productivity changes among products and types of farming enterprise.

1.031. Changes in Farm Production and Efficiency. U. S. Department of Agriculture, Agricultural Research Service, June 1954 (40 pp.); June 1955 (43 pp.); June 1956 (43 pp.).

An annual publication presenting major statistical data on farm production, production inputs and productivity starting June 1954 covering data for year 1953. Supplements presenting crops by geographic division are available.

1.032. Changes in Farming in War and Peace. Sherman E. Johnson. U. S. Department of Agriculture, Bureau of Agricultural Economics, June 1946 (99 pp.).

Changes in farming from World War I through World War II. Factors responsible for the unusually large increases in production during World War II and the peacetime significance of this increased output.

1.033. Changes in Technology and Labor Requirements in Crop Production: Corn. L. K. Macy, L. E. Arnold, and E. G. McKibben. Washington: United States Works Progress Administration, National Research Project, June 1938, Report No. A-5 (181 pp.). o. p.

The effects of changes in farming methods and practices on the volume of labor used in producing corn. Estimates of labor needed to produce the corn crop since 1909 and, also, the amount of labor required per acre to grow corn in selected areas in the United States.

1.034. Changes in Technology and Labor Requirements in Crop Production: Cotton. W. C. Holley and L. E. Arnold. Washington: United States Works Progress Administration, National Research Project, September 1938, Report No. A-7 (132 pp.). o. p.

Labor requirements per acre by area, 1909, 1919, 1926, and 1936, and dependence of labor efficiency on mechanization, varieties of cotton, crop rotation, use of fertilizers, and methods of combating diseases and pests.

1.035. Changes in Technology and Labor Requirements in Crop Production: Potatoes. Harry E. Knowlton, Robert B. Elwood, and Eugene G. McKibben. Washington: United States Works Progress Administration, National Research Project, March 1938, Report No. A-4, (134 pp.). o. p.

Technological developments and changes in agricultural practices in the production of potatoes and an estimate of their effects on labor requirements and agricultural employment, 1909-36.

1.036. Changes in Technology and Labor Requirements in Crop Production: Sugar Beets. Loring K. Macy and others. Washington: United States Works Progress Administration, National Research Project, August 1937, Report No. A-1 (48 pp.). o. p.

Estimates of labor required per acre and per ton in producing sugar beets, by States and for the United States from a field survey conducted by NRP during 1936, the Department of Agriculture, U. S. Tariff Commission and State agricultural experiment stations.

1.037. Changes in Technology and Labor Requirements in Crop Production. Vegetables. J. C. Schilleter and others. Washington: United States Works Progress Administration, National Research Project, September 1939, Report No. A-12 (131 pp.). o. p.

The effect of changes in farming techniques and in the level of production on the amount of labor used in producing the principal vegetable crops of the United States from 1918 to 1936.

449922 O - 58 - 2

1.038. Changes in Technology and Labor Requirements in Crop Production: Wheat and Oats. R. B. Elwood, L. E. Arnold, D. C. Schmutz, and E. G. McKibben. Washington: United States Works Progress Administration, National Research Project, April 1939, Report No. A-10 (182 pp.). o. p.

The historical development of the more important machines used in small grain production; agronomous developments tending to raise productivity; the effects of mechanization on labor requirements for individual operations. Data are from the NRP farm survey.

1.039. The Contribution of Technological Progress to Farm Output: 1950-75. Vernon W. Ruttan. The Review of Economics and Statistics, February 1956 (pp. 61-69).

Models for American agriculture illustrate consequence of alternative rates of technological change on aggregate input categories during the next quarter century.

1.040. Differentials in Productivity and in Farm Income of Agricultural Workers by Size of Enterprise and by Region. Louis J. Ducoff and Margaret J. Hagood. U. S. Department of Agriculture, 1944 (54 pp.).

The development of a unique method of measurement.

1.041. Farm Costs and Returns, 1955 (With Comparisons) Commercial Family-Operated Farms, by Type and Location. U. S. Department of Agriculture, Agricultural Research Service, June 1956, Agriculture Information Bull. No. 158 (62 pp.).

Summary results of farm operations in 1955 on selected types and sizes of farms including production per unit of input.

1.042. Farm Work Simplification. Lawrence M. Vaughan and Lowell S. Hardin. John Wiley and Sons, Inc., 1949 (145 pp.).

Principles applicable to all agricultural activities and technical research into methods of simplification.

1.043. Field and Crop Labor on Georgia Farms (Coastal Plain Area) L. A. Reynoldson. U. S. Department of Agriculture, 1925, Bull. No. 1292 (28 pp.).

Labor requirements, acreage and yield of crops, and average man-hours required per acre for individual crops.

1.044. Gains in Productivity of Farm Labor. Reuben W. Hecht and Glen T. Barton. U. S. Department of Agriculture, 1950, Bull. No. 1020 (121 pp.).

Indexes of man-hour requirements and of production per man-hour for many crops and types of livestock, by area, 1910-50 and factors contributing to the increase in productivity.

1.045. Gross National Farm Product in Constant Dollars, 1910-50. John W. Kendrick and Carl E. Jones. U. S. Department of Commerce, Survey of Current Business, September 1951, Vol. 31, No. 9 (pp. 13-19).

Farm labor productivity, as measured by the ratio of real farm product to man-hours worked.

1.046. Improving Labor Efficiency through Improving Farm Organization. P. E. Johnston, Journal of Farm Economics, November 1951 (pp. 808-817).

A possible solution to United States problem of farm labor shortage.

1.047. Increased Productivity of the Farm Worker. Glen T. Barton. Cornell University, Industrial and Labor Relations Review, January 1948 (pp. 264-282).

Trends in production per worker, 1910-14 to 1946 and factors affecting productivity and a forecast for the future.

1.048. Increasing Labor Efficiency of Individual Farm Enterprises. E. J. Nesius. Journal of Farm Economics, November 1951 (pp. 818-826).

The achievement of greater farm labor efficiency and how to deal with basic economic problems.

1.049. Labor Productivity and Size of Farms: A Statistical Pitfall. G. J. Stigler. Journal of Farm Economics, 1946 (pp. 821-825).

Adapting size of the farm to the capital and manpower available to solve manpower shortage in agriculture.

1.050. Labor Productivity in Agriculture and Industry. Reuben W. Hecht. U. S. Department of Agriculture, Agricultural Situation, November 1950 (pp. 2-3).

The relationship between productivity changes in agriculture and in other industries.

1.051. Labor Requirements for Crops and Livestock. M. C. Cooper, W. C. Holley, H. W. Hawthorne, and R. S. Washburn. U. S. Department of Agriculture, May 1943 (140 pp.).

Labor requirements by States and by agricultural regions, and man-hours per acre in an average year for 90 crops and for various classes of livestock.

1.052. Labor Used for Field Crops. Reuben W. Hecht and Keith R. Vice. U. S. Department of Agriculture, June 1954, Statistical Bull. No. 144 (45 pp.).

Labor required per acre for selected crops, 1950.

1.053. Labor Used for Livestock. Reuben W. Hecht. U. S. Department of Agriculture, May 1955, Statistical Bull. No. 161 (22 pp.).

Includes estimates of man-hours per head or per unit of production for selected types of livestock, 1950.

1.054. The Magnificent Decline of U. S. Farming. Gilbert Burck. Fortune, June 1955 (pp. 99-103).

Productivity improvement in the past quarter century as the most important development in American agriculture.

1.055. More Food from Fewer Workers. Shirley S. Hoffman. The Conference Board Business Record, May 1955, Vol. XII, (pp. 184-187).

Contributing factors to the rapid increase in farm productivity in the past half century.

1.056. Multiple Unit Operations and Gross Labor Productivity Within the Old Cotton Belt. William H. Nicholls. Journal of Farm Economics, November 1952 (pp. 463-481).

Comparison of levels of productivity in various plantations.

1.057. Production and Welfare in Agriculture. T. W. Schultz. New York: Macmillan Co., 1950 (225 pp.).

The effect on foreign relations of the United States farm program to increase productivity and obtain a better division of income.

1.058. Productivity in Agriculture: 1909-1942. U. S. Department of Labor, Bureau of Labor Statistics, November 1943 (20 pp.), and Monthly Labor Review, March 1944 (pp. 514-520). Supplements: 1942-43, June 1944 (4 pp.); 1942-44, May 1945 (6 pp.); 1942-45, June 1946 (7 pp.); 1909-46, November 1947 (27 pp.); 1909-47, November 1948 (27 pp.); 1909-48, October 1949 (31 pp.).

Indexes of agricultural production, employment, and output per worker, for the United States as a whole and by farming area, and contributing factors.

1.059. The Productivity Capacity of Rural and Urban Labor: A Case Study. Robert E. Weintraub. Journal of Political Economy, October 1955 (pp. 412-426).

The interchangeability of labor employed in agriculture and other labor, 1947-53.

1.060. Productivity of Agriculture Workers by Size of Enterprise and by Region. J. Oser. Journal of Farm Economics, November 1948 (pp. 764-770).

Criticism and possible improvements of the Ducoff and Hagood method of measuring productivity of farm workers in "Differentials in Productivity and Farm Income of Agricultural Workers by Size of Enterprise and by Region."

1.061. Productivity of Farm Labor. Federal Reserve Bank of Kansas City, Monthly Review, April 1955 (pp. 3-8).

Changes in farm labor in relation to other productive agents, in terms of employment, labor requirements, and farm wage rates, 1910-55.

1.062. Productivity of Farm Labor, 1909 to 1938: Changes in Average Output. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1939 (pp. 282-294).

Increases in the average output of farm workers by principal farming regions and by major crops, and the technological changes responsible for the increases.

1.063. Productivity of Resources used on Commercial Farms. Edwin G. Strand and others. U. S. Department of Agriculture, November 1955, Technical Bull. No. 1128 (86 pp.). Published in cooperation with the Iowa Agricultural Experiment Station.

An analysis of productivity in 68 regions to provide a basis for appraising the differences between returns and production resources in 1949.

1.064. Productivity Trends 1909 to 1950: Agriculture. Allan D. Searle and Enzo Puglisi. U. S. Department of Labor, Bureau of Labor Statistics, March 1952 (34 pp.).

Indexes of production, productivity and employment for United States and major geographic regions and an analysis of factors affecting trend changes.

1.065. Progress of Farm Mechanization. Martin C. Cooper, Glen T. Barton, and Albert P. Brodell. U. S. Department of Agriculture, Misc. Pub. No. 630, October 1947 (101 pp.).

The growth pattern of farm mechanization and technological improvements and their effect on output per worker, employment, production costs and returns of agriculture.

1.066. Relation of Agricultural Production to Inputs. Glen T. Barton, and M. C. Cooper. Harvard University, Review of Economics and Statistics, May 1948. Vol. 30 (pp. 117-126).

Farm production as related to the inputs of land, livestock, machinery and a combined unit of input including labor.

1.067. Requirements and Costs for Picking, Snapping, and Sledding Cotton in West Texas and Oklahoma. A. P. Brodell and M. C. Cooper. U. S. Department of Agriculture, June 1927 (7 pp.).

Unit man-hour requirements for harvesting, and unit cost for harvesting and ginning by 3 harvesting methods for 4 districts.

1.068. Resource Adjustments to Equate Productivities in Agriculture. Earl O. Heady and C. B. Baker. University of North Carolina, Southern Economics Journal, July 1954, Vol. 21 (pp. 36-52).

The effects of different quantities of capital on labor productivity and optimum allocation of resources in the United States.

1.069. Resource Productivity and Income for a Sample of West Kentucky Farms. H. R. Jensen and W. B. Sundquist. Kentucky Agricultural Experimental Station, June 1955, Bull. No. 630 (35 pp.).

Marginal value productivities of the resource and resource service inputs of land labor, crop and livestock services.

1.070. Resource Productivity, Returns to Scale, and Farm Size. Earl O. Heady, Glen L. Johnson, and Lowell S. Hardin. Ames: Iowa State College, 1956 (202 pp.).

Problems, research techniques, and results of investigations dealing with resource productivity and size of business in agricultural production.

1.071. Resource Returns and Productivity Coefficients in Selected Farm Regions. Earl O. Heady and Russell Shaw. Journal of Farm Economics Vol. 36, May 1954 (pp. 243-258).

A measurement of the marginal value of productivity of resources in different farming regions to predict the effect of different quantities on the value of the product produced.

1.072. Resource Use and Productivity in World Agriculture. Jyoti P. Bhattachorjee. The American Farm Economic Association, Journal of Farm Economics, February 1955 (14 pp.).

Productivity of resources in world agricultural production and the relative efficiency in their uses.

1.073. Technology: Farmings Chemical Age. Eric Hodgins. Fortune, November 1953 (pp. 151-155).

How United States farm productivity can be doubled in the next two decades.

1.074. Technology on the Farm. U. S. Department of Agriculture, August 1940 (224 pp.).

Technological developments and improvements in agricultural practices and their effects on the national economy. The displacement of farm workers resulting from the technological changes are considered.

1.075. Trend in Size and Production of the Aggregate Farm Enterprise, 1909-36. R. G. Bressler and J. A. Hopkins. United States Works Progress Administration, National Research Project, July 1938, Report No. A-6 (255 pp.). o. p.

Measures of agricultural production, total acreage of land worked, and livestock on farms. Base period (1924-29) unit labor requirements are used as weights in the derivation of the production indexes.

1.076. Trends in Agricultural Employment. Louis J. Ducoff and Margaret Hagood. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1947 (pp. 649-653).

Productivity trends in the period before World War II through 1946.

1.077. Trends in Employment in Agriculture, 1909-36. E. E. Shaw and J. A. Hopkins. United States Works Progress Administration, National Research Project, November 1938, Report No. A-8 (163 pp.). o. p.

A productivity measure derived from the employment series and the production indexes published in "Trends in Size and Production of the Aggregate Farm Enterprise, 1909-36" by R. G. Bressler, Jr. and J. A. Hopkins (NRP Report No. A-6).

C. Construction

1.078. Building Labor Productivity. Engineering News Record, April 18, 1946, Vol. 136 (p. 557).

Productivity in building construction, covering 54 contractors in 18 metropolitan areas.

1.079. Construction Labor Productivity. Engineering News Record, April 17, 1947 (pp. 92-93).

Construction labor productivity for the first quarter of 1947, utilizing data by 26 building contractors in 12 large cities.

1.080. Construction Productivity Rising. Engineering News Record, May 27, 1948 (pp. 97-99).

An analysis of labor productivity by city and by type of skill.

1.081. Labor and Material Costs in Small House Construction. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1939 (pp. 1058-1061).

Man-hours and payrolls at the site, by occupation, and material costs.

1.082. Labor and Unit Costs in P. W. A. Low-Rent Housing. Herman B. Byer and Clarence A. Trump. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1939 (pp. 578-586).

Estimates of man-hours worked at the site and off the site beginning in 1934.

1.083. Labor Productivity and Costs in Certain Building Trades. Ethelbert Stewart. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1924 (pp. 945-959).

Labor productivity and cost indexes for bricklaying, plastering, painting, and roofing for several cities.

1.084. Labor Relations and Productivity in the Building Trades. William Haber and Harold M. Levinson. University of Michigan, Bureau of Industrial Relations, 1956 (254 pp.).

Labor relations practices and other factors as they relate to productivity and costs in housing construction.

1.085. Labor Requirements in Road Construction. Lillian Lunenberg. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, April 1939 (pp. 824-828).

Man-hours (at site and off site) per million dollars of contracts awarded for federal road and bridge construction from July 1935 to August 1937.

1.086. Productivity of Labor in Street and Road Building and in Ditch Digging. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1931 (pp. 1265-1274).

Striking instances of increased productivity in the various operations.

1.087. Productivity of Labor in the Building of Concrete Roads in Illinois. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1932 (pp. 1026-1028).

Based upon information obtained from a representative contracting company for typical contracts in 1919, 1925, and 1930.

D. Manufacturing

1. All manufacturing or combinations of industries

1.088. Capital and Output Trends in Manufacturing Industries 1880-1948. Daniel Creamer. National Bureau of Economic Research, Inc., 1954, Occasional Paper No. 41 (104 pp.).

An analysis of past trends in the relationship between the stock of capital and output to throw light on long-term future prospects. Tables of ratios of total capital to output for major and minor manufacturing industries for selected years, 1880-1948.

1.089. Cyclical Changes in Input-Output Relations. Thor Hultgren. American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1955-56 (pp. 272-280). Paper presented at the 115th Annual Meetings, New York 1955.

An examination of long-run and short-run productivity fluctuations for combined manufacturing and separate industries.

1.090. Employment in Manufacturing, 1899-1939. Solomon Fabricant. National Bureau of Economic Research, 1942, No. 41 (362 pp.).

Indexes of employment, man-hours, output, workers and man-hours per unit of product for all manufacturing, major manufacturing groups, and separate manufacturing industries. Changes in employment, output, and unit labor requirements are analyzed against the background of corresponding changes in hours of work, wage costs, selling price, and capital investment.

1.091. The Facts of Productivity. Ewan Clague. Paper presented before the Annual Meeting of the Society for the Advancement of Management, New York, N. Y. U. S. Department of Labor, Bureau of Labor Statistics, December 6, 1946 (11 pp.).

Significance of productivity measurement and analysis of changes in output per man-hour for all manufacturing and for specified industries for selected years, 1925-49.

1.092. Hourly Earnings and Unit Labor Cost in Manufacturing. Irving H. Siegel. Journal of the American Statistical Association, September 1940, Vol. 35 (pp. 455-460).

Clarification of the role of rising productivity in countering rising hourly earnings. Indexes of hourly earnings, labor cost, price and output per man-hour for all manufacturing, 1919-39.

1.093. Index of Productivity of Labor in the Steel, Automobile, Shoe and Paper Industries. Ewan Clague. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1926 (pp. 1-19).

Production, employment and productivity trends, 1909-23.

1.094. Indexes of Output per Man-Hour and Unit Man-Hours in Manufacturing. Allan D. Searle and Jack Alterman. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1956, (pp. 63-68).

Condensed from the report on "Trends in Output per Man-Hour and Man-Hours per Unit of Output--Manufacturing, 1939-53."

1.095. Keeping the BLS Figure Factory Out of the Line of Battle. Business Week, July 17, 1954 (4 pp.).

The Bureau of Labor Statistics work program and a report on productivity advancement in manufacturing.

1.096. A Look at the Productivity Record. Gertrude Deutsch. National Industrial Conference Board, Conference Board Business Record, February 1949, Vol. 6 (pp. 53-55).

Changes in output per man-hour and average hourly earnings in 22 selected manufacturing industries, 1939-47.

1.097. Man-Hour Output in Manufacturing. Gertrude Deutsch. National Industrial Conference Board, Conference Board Business Record, February 1950, Vol. 7 (pp. 60-63).

Changes in productivity for manufacturing as a whole and for individual industries.

1.098. Man-Hour Trends in Selected Industries: Men's Dress Shirts, Man-Hours per Dozen 1939-47; Footwear Manufacture, Man-Hours per Pair, 1939-45; Fertilizer Manufacture, Man-Hours per Ton, 1939-46. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1948 (pp. 254-260).

Summary of industry reports published separately by the Bureau of Labor Statistics.

1.099. Monthly Production Indexes and Changes in Output per Man-Hour. Milton Moss. Paper presented at the annual meeting of the American Statistical Association, New York City, December 30, 1955. Productivity Measurement Review, November 1956, No. 7 (pp. 4-10).

Includes a discussion of output per man-hour in manufacturing, 1947-1955, compiled by the Federal Reserve Board.

1.100. The Output of Manufacturing Industries, 1899-1937. Solomon Fabricant. National Bureau of Economic Research, 1942, No. 39 (685 pp.).

Indexes of physical output, and changes in the size and composition of output for all manufacturing; major manufacturing groups and a large number of individual manufacturing industries. The basic data on the quantities, values, and values per unit for individual products and on value added by manufacture for the separate industries are presented in full.

1.101. Output per Man-Hour in Manufacturing, 1939-47 and 1947-53. Leon Greenberg. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1956, (pp. 1-6).

Condenses from BLS publication, Trends in Output per Man-Hour and Man-Hours per Unit in Manufacturing, 1939-53.

1.102. Production, Employment and Productivity in 59 Manufacturing Industries, 1919-36. Harry Magdoff, Irving H. Siegel, and Milton B. Davis. United States Works Progress Administration, National Research Project, May 1929, Report No. S-1 (547 pp.). o. p.

Trends, sources of data and methods used in the development of production and productivity measures.

1.103. Productivity and Unit Labor Cost in Selected Manufacturing Industries 1919-40. U. S. Department of Labor, Bureau of Labor Statistics, February 1942 (111 pp.).

Revisions and extension of United States Works Progress Administration, National Research Project report, "Production, Employment, and Productivity in 59 Manufacturing Industries, 1919-36."

1.104. Productivity and Unit Labor Cost in Selected Manufacturing Industries 1939-45. U. S. Department of Labor, Bureau of Labor Statistics, May 1946 (18 pp.).

An extension of "Productivity and Unit Labor Cost in Selected Manufacturing Industries, 1919-1940" which was published by BLS in 1942.

1.105. Productivity Gains Equal Expectations. J. C. May and G. C. Thompson. National Industrial Conference Board, Conference Board Business Record, May 1950, Vol. 7 (pp. 191-194).

Analyzes replies to a questionnaire sent to a number of manufacturing industries.

1.106. Productivity of Labor in the Cement, Leather, Flour and Sugar Refining Industries, 1914 to 1925. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1926 (pp. 690-701).

Indexes of production, man-hours, and output per man-hour.

1.107. Productivity of Labor in 11 Manufacturing Industries. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1930 (pp. 501-517).

Indexes of production, man-hours, and output per man-hour (1899-1927) in: iron and steel, boots and shoes, leather, meatpacking, petroleum refining, paper and pulp, cement, automobiles, rubber tires, flour milling and cane sugar refining.

1.108. Recent Trends in Productivity. Ewan Clague. U. S. Department of Labor, Bureau of Labor Statistics, (Material submitted to Joint Economic Committee for Hearings on January 1957 Economic Report of the President), January 1957 (4 pp.).

Long-run and postwar trends: 1939-53; 1947-53; and 1953-56; with analysis of productivity changes.

1.109. The Relations Between Factory Employment and Output Since 1899. Solomon Fabricant. New York: National Bureau of Economic Research, December 1941, Occasional Paper No. 4 (39 pp.).

Traces manufacturing output, employment, and labor per unit of product since 1899.

1.110. Trends in Output per Man-Hour and Man-Hours per Unit of Output--Manufacturing, 1939-53. U. S. Department of Labor, Bureau of Labor Statistics, 1955, Report No. 100 (33 pp.). Excerpts from Automation and Technological Change. Hearings before the Subcommittee on Economic Stabilization of the Joint Committee on the Economic Report, 1955. (pp. 301-334). (See reference in Section IV).

BLS productivity indexes for postwar and earlier years, sources of data, methodology used in compiling indexes, and factors affecting productivity changes.

1.111. Trends in Productivity, 1919-1943.. Gertrude C. Deutsch, R. Feldman, and Martin R. Gainsbrugh. Conference Board Business Record, 1945 (pp. 51-55).

Past trends and future outlook for productivity.

1.112. What is Happening to Industrial Productivity. A. N. Wecksler. Mill and Factory, March 1957 (pp. 83-87).

Productivity index in manufacturing 1919-57 with an analysis of the economic importance of these changes.

1.113. What's Happening to Productivity? Factory Management and Maintenance, September 1947 (pp. 66-69). Article of same title in September 1948 issue.

A questionnaire survey to determine productivity change covered by the period 1946 to 1947 and factors affecting productivity in selected industry groups.

2. Food and kindred products

1.114. Labor Productivity and Displacement in the Slaughtering and Meat Packing Industry. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1932, (pp. 1018-1025).

A study by BLS in the cattle, hog, calf, and sheep killing departments and hog cutting departments of 3 large and 3 medium-sized slaughtering and meatpacking establishments, 1914-31.

1.115. Labor Productivity Functions in Meat Packing. William H. Nicholls. University of Chicago Press, 1948 (256 pp.).

The fresh pork operations of a large midwestern meatpacking plant during the years 1938 to 1940. Relation between production, labor cost and man-hours, in which employment and hours (workweek) are separately treated.

1.116. Labor Productivity in Slaughtering. Ethelbert Stewart. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1924 (pp. 488-495).

Output per man-hour, hourly wage rates, and unit labor cost by occupations for 1900, 1902, 1903 and 1923.

1.117. Productivity and Employment in Selected Industries: Beet Sugar. Raymond K. Adamson and Miriam E. West. United States Works Progress Administration, National Research Project, October 1938, Report No. N-1 (190 pp.). o. p.

Changes in employment, unit labor requirements and productivity in various segments of the industry, 1917-36.

1.118. Productivity in Slaughtering and Meat Packing Industry, 1919-41. A. W. Frazer. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1942 (pp. 1092-1099).

The history and characteristics of the meatpacking industry with indexes of production, employment, man-hours, payrolls, and unit labor cost.

1.119. Productivity in the Beet Sugar Industry, 1939-48. Catherine S. Kaplan and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, May 1950 (5 pp.). Supplements: 1939-49, February 1951 and 1939-50, November 1951 (7 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour.

1.120. Productivity in the Bread and Other Bakery Products Industry, U. S. Department of Labor, Bureau of Labor Statistics, August 1948 (2 pp.). o. p.

Indexes of production, production workers, man-hours, output per production worker and per man-hour, 1939-47.

1.121. Productivity in the Cane Sugar Refining Industry. U. S. Department of Labor, Bureau of Labor Statistics, October 1948 (2 pp.). o. p.

Indexes of production, production workers, man-hours, output per production worker and per man-hour, 1939-47.

1.122. Productivity Trends in the Canning and Preserving Industries, 1939 to 1949. Bernard Michael and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, September 1950 (7 pp.). Supplement: 1939-1950, January 1952 (9 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

1.123. Productivity Trends in the Condensed and Evaporated Milk Industry, 1939-50. Glen F. Vogel. U. S. Department of Labor, Bureau of Labor Statistics, May 1952 (9 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and some factors affecting trend changes.

1.124. Productivity Trends in the Confectionery Industry, 1939 to 1951. Bernard Michael and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, April 1952 (8 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

1.125. Productivity Trends in the Flour and Other Grain-Mill Products Industry, 1939-51. Bernard Michael and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, July 1952 (12 pp.).

Indexes of production, production workers, man-hours, output per production and per man-hour, and an analysis of some factors affecting trend changes.

1.126. Productivity Trends in the Ice Cream Industry, 1939-51. Natalie C. Strader and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, June 1952 (11 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

1.127. Productivity Trends in the Malt Liquors Industry, 1939 to 1950. Marion D. Hall. U. S. Department of Labor, Bureau of Labor Statistics, February 1952 (6 pp.).

Indexes of production, employment, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

1.128. Productivity Trends in the Milling Industry. L. A. Epstein and Harry Brenner. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1941 (pp. 83-94).

Indexes of production, employment, man-hours, productivity, payrolls and unit labor cost, 1899-1939, and the effect of plant size and geographic shifts on productivity.

1.129. Trends in Man-Hours Expended per Ton, Cane Sugar Refining, 1939-46. Frank L. Wood and Maxwell I. Klayman. U. S. Department of Labor, Bureau of Labor Statistics, September 1949 (58 pp.). Supplements: 1946-48, March 1950 (7 pp.); 1948-49, June 1951 (15 pp.); 1949-50, February 1952 (11 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

3. Tobacco manufactures

1.130. Mechanization and Productivity of Labor in the Cigar Manufacturing Industry. W. Duane Evans. U. S. Department of Labor, Bureau of Labor Statistics, September 1938, Bull. No. 660 (66 pp.).

The trend toward mechanization of cigar manufacture and the implications mechanization of the industry. Descriptions of cigarmaking for both hand and machine methods. Average man-hour requirements by various methods of cigarmaking from data collected for 15 plants.

1.131. Productivity Trends in the Tobacco Products Industries, 1939-1950. Bernard Michael. U. S. Department of Labor, Bureau of Labor Statistics, March 1952 (9 pp.).

Indexes of production, employment, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

449922 O - 58 - 3

4. Textile mill products (for synthetic fibers see "Chemicals and allied products")

1.132. Developments Affecting Productivity in the Cotton Goods Industry. Irving H. Siegel and Celia S. Gody. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1942 (pp. 47-53).

Factors influencing productivity in the cotton goods industry during the early war period.

1.133. Labor Productivity and Labor Costs in Cotton Manufacturing. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1926 (pp. 463-474).

The relationship between production, man-hours and the money paid for labor for cotton cloth, 1915 and 1926.

1.134. Location Theory and the Cotton Industry. S. Hammond. New York: New York University Press, Journal of Economic History, Supplement II, December 1942 (pp. 101-117).

Comparison between the North and South of wages and productivity since 1900.

1.135. Mechanical Changes in the Cotton Textile Industry, 1910 to 1936. Boris Stern. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1937 (pp. 316-341).

Unit labor requirements for the manufacture of 8 cotton textile products using the most modern equipment available.

1.136. Mechanical Changes in the Woolen and Worsted Industries, 1910 to 1936, U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1938 (pp. 58-93).

Changes in processes used to manufacture particular types of woolen and worsted cloth, and man-hour requirements by departments based on a field study.

1.137. Productivity Changes in the Textile Industry. Solomon Barkin, Director of Research, Textile Workers Union of America, (1 p.). Extension of Remarks of Hon. Thomas J. Lane of Massachusetts in the House of Representatives Monday May 2, 1955.

Employment, man-hours, production and total yards per man-hour 1947-1954.

1.138. Productivity of a New England Cotton Mill, 1838 to 1925. Ann Jamba. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1926 (pp. 701-712).

The history of a New England cotton mill. Production of cloth per man-hour for the sheeting and the flannel mill combined.

1.139. Regional Differences in Costs and Productivity in the American Cotton Manufacturing Industry, 1880-1910. Chen-Han Chen. The Quarterly Journal of Economics, August 1944, Vol. 50 (pp. 533-566).

Real wage rates, labor supply, productivity of labor and technical improvements in the northern and southern States.

1.140. Regional Labor Productivity in the Textile Industry. J. W. Markham. The American Economic Review, March 1943, Vol. 33 (pp. 110-115).

A comparison of productivity of labor in selected northern and southern plants of two large textile corporations.

5. Apparel and other finished products made from fabrics and similar materials.

1.141. Higher Productivity through Product Analysis. Washington: International Cooperation Administration, February 1953 (15 pp.).

How one European product (jacket) was analyzed by American industry and redesigned to reduce production costs, without altering its quality or its outward appearance.

1.142. Productivity in the Hosiery Industries, 1939-49. Allan D. Searle and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, October 1950 (7 pp.). Supplement: 1939-1950, October 1951 (7 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

1.143. Trends in Man-Hours Expended per Dozen Men's Dress Shirts, 1939-47. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, May 1948 (100 pp.). Supplements: 1947-48, March 1950 (31 pp.); 1948-49, July 1951 (18 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.144. Trends in Man-Hours Expended per Dozen Men's Work Clothing, 1945-49. John Peterson. U. S. Department of Labor, Bureau of Labor Statistics, May 1952 (31 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

6. Lumber and wood products (except furniture)

1.145. Labor Efficiency and Productiveness in Sawmills. Ethelbert Stewart. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1923 (pp. 1-21).

Average time and labor cost per 1,000 ft. of lumber, and earnings and output per hour for various occupations by States based on data from 276 sawmills in 22 States.

1.146. Labor Requirements: Hardwood Flooring Production. Roland V. Murray and Eugene V. Lowther. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1947 (pp. 49-53).

Factors affecting man-hour requirements and the levels of unit man-hours expended.

1.147. Labor Requirements in Southern Pine Lumber Production. Eugene V. Lowther and Roland V. Murray. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1946 (pp. 941-953).

The third of a series on man-hour requirements in the production of building materials. Unit man-hour levels by operation, type of lumber, and a comparison of requirements in 1935 and 1946.

1.148. Man-Hour Productivity in the Lumber Industry in the Pacific Coast States in 1929. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1932 (pp. 818-825).

Output per man-hour and output per wage earner, by State (California, Oregon, Washington) and by size of plant.

1.149. Output per Man-Hour in a Forest Industry. Allan D. Searle and Adolph Scolnick. 1953 (pp. 127-132). (Reprinted from "Research in the Economics of Forestry") Washington: The Charles Lathrop Pack Forestry Foundation, 1953 (475 pp.).

Changes in the amount of labor which accompany changes in physical volume of output.

7. Paper, printing and allied products

1.150. Are We Operating at Maximum Productivity? W. J. Dyck. Paper Industry, May 1954 (pp. 137-138).

Methods of increasing productivity in the pulp and paper industry.

1.151. How to Increase Labor Productivity. J. D. Corrigan. Paper Industry, December 1947, Vol. 29 (pp. 1310-1311).

Job evaluation, production standards and incentives, plant layout, and production planning to improve productivity in paper mills.

1.152. Increased Productivity. Paper Industry, May 1954 (pp. 141-163).

Methods of increasing productivity in twelve stages of manufacturing in the pulp and paper industry.

1.153. Productivity of Labor in Newspaper Printing. S. Kjaer. U. S. Department of Labor, Bureau of Labor Statistics, March 1929, Bull. No. 475 (253 pp.).

Labor cost, man-hours and output per man-hour for composition, stereotyping, and presswork in a modern newspaper establishment.

1.154. The Pulp and Paper Industry in the U. S. A. Paris: European Productivity Agency, Organization for European Economic Co-operation, 1951 (348 pp.).

The findings of thirty-four experts from twelve countries on structure, past and present trends, and the manner of the extraordinary growth of the industry in the United States.

8. Chemicals and allied products

1.155. Labor Requirements for Manufacture of Synthetic Rubber. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1945 (pp. 990-999).

Based on a BLS field study. Supplements and revises a study published in the Monthly Labor Review, May 1943.

1.156. Labor Requirements for Synthetic Rubber Industry. James M. Silberman and George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1943 (pp. 837-845).

Unit labor requirements by type of synthetic rubber, size of plant, and occupation. The composition of the labor force needed, and problems of staffing are discussed.

1.157. Productivity and Technological Changes in the Chemicals Industry, 1929-40. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1942 (pp. 53-57).

Indexes of production, employment and productivity, and a discussion of technological changes.

1.158. Productivity in the Fertilizer Industry. U. S. Department of Labor, Bureau of Labor Statistics, August 1948 (2 pp.). o. p.

Indexes of production, production workers, man-hours, output per production worker and per man-hour, 1939-47.

1.159. Productivity Trends in the Rayon and Other Synthetic Fibers Industry, 1939-48. Bernard Michael and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, March 1950 (6 pp.). Supplements: 1939-49, October 1950 (7 pp.); 1939-50, February 1952 (7 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting productivity.

1.160. Rayon Labor Productivity. Textile Economics Bureau, Inc., Textile Organon, September 1946, Vol. 17 (p. 140).

Output per man-hour, 1939-46. Comparison is made with the BLS index.

1.161. Trends in Man-Hours Expended per Ton in the Manufacture of Fertilizer, 1939-46. Maxwell I. Klayman. U. S. Department of Labor, Bureau of Labor Statistics, May 1948 (60 pp.). Supplements: 1946-47, March 1950, (26 pp.); 1947-48, April 1950 (10 pp.); 1948-49, March 1952 (22 pp.). o. p.

Man-hours per unit of product for individual products and for for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.162. Trends in Man-Hours Expended per Unit, Soap and Glycerin Manufacture, 1939-47. A. William Buschman. U. S. Department of Labor, Bureau of Labor Statistics, November 1948 (66 pp.). Supplements: 1947-48, March 1950 (4 pp.); 1948-49, August 1951 (15 pp.).

Man-hours for unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.163. Trends in Man-Hours Expended per Unit, Synthetic Rubber and Components, 1945-49. Herman Slomin, U. S. Department of Labor, Bureau of Labor Statistics, April 1952 (49 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.164. Unit Man-Hour Requirements, Soap Manufacture, 1939-47. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1948 (pp. 618-619).

Summarization of "Trends in Man-Hours Expended per Unit, Soap and Glycerin Manufacture, 1939-47."

9. Products of petroleum and coal

1.165. How is Productivity of Refinery Labor Changing? W. L. Nelson. Oil and Gas Journal, September 24, 1956 (p. 157).

Index of capacity per employee 1919-56, with analysis of trends.

1.166. Injury Experiences in the Coking Industry, Detailed Analysis of Safety Factors and Related Employment Data. U. S. Department of the Interior, Bureau of Mines. Annual Bulletins, Technical paper 1913-1943. First issue annual bulletin 1951 containing data for intervening years.

Output per man-hour, by type of oven.

1.167. Man-Hour Productivity in the Petroleum-Refining Industry in 1929. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1932 (pp. 1283-1292).

Output per man-hour and per wage earner by type of operation, by State, by size of plant, by average hourly earnings and by horsepower.

1.168. Productivity in the Coke Oven Industries: 1939-48. Daniel J. Swist and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, August 1950 (9 pp.). Supplement: 1939-1950, February 1952 (16 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour, and an analysis of some factors affecting trend changes.

10. Rubber products (for synthetic rubber see "Chemicals and allied products")

1.169. Labor Productivity in the Automobile Tire Industry. Boris Stern. U. S. Department of Labor, Bureau of Labor Statistics, 1933, Bull. No. 585 (74 pp.).

Records of 6 major tire plants, 1922-31. Technological changes in the manufacturing processes during the period and their effects upon labor.

1.170. Productivity of Labor in the Rubber Tire Manufacturing Industry. John D. Gaffey. New York: Columbia University Press, 1940 (204 pp.).

The technological and economic history from the standpoint of productivity. Six measurements of productivity are given for the period 1914-37: (1) tires per man-year, (2) tires per man-hour, (3) tire-miles per man-year, (4) pounds per man-hour, (5) pounds per man-year and, (6) tire miles per man-hour.

11. Leather and leather goods

1.171. Labor Productivity and Displacement in the Leather Industry. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1932 (pp. 473-478).

Data on output per man-hour (1923 and 1931) in 5 major branches of the industry from plants representing about 55 percent of the industry in 1931.

1.172. Labor Productivity in Boot and Shoe Making Before the Invention of Machinery. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1929 (pp. 1293-1294).

Based on the 1817-22 diary of a skilled shoemaker and the 1806 trial of the Journeyman Cordwainers of Philadelphia.

1.173. Labor Productivity in the Boot and Shoe Industry. Boris Stern. U.S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1939 (pp. 271-292).

Factors affecting productivity based on a field study of 43 plants, 1923-36.

1.174. Labor Productivity in the Leather Industry. John R. Arnold. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1937 (pp. 68-77).

Summary of a study by BLS and WPA for the period 1923-35, based on a survey covering about 54 percent of the industry.

1.175. Leather Manufacturing: Man-Hour Requirements, 1939-46. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1948 (pp. 383-385).

Summary of report "Trends in Man-Hours Expended per Unit, Selected Types of Leather," published by the Bureau of Labor Statistics

1.176. Productivity as Seen by the Manufacturer. Boot and Shoe Recorder. April 15, 1956 (pp. 27-30).

A review of the National Shoe Manufacturers Association's study of the increase in productivity over the past 25 years stressing the need for further increase.

1.177. Productivity in the Footwear, Except Rubber, Industry. U. S. Department of Labor, Bureau of Labor Statistics, August 1948 (2 pp.). o. p.

Indexes of production, production workers, man-hours, output per production worker and per man-hour, 1939-1947.

1.178. Productivity in the Leather Industry. Benjamin D. Kaplan. Leather and Shoes, February 12, 1949 (pp. 24-25 ff.).

A study covering an 8-year period reveals findings important to future production methods.

1.179. Productivity in the Leather Industry. U. S. Department of Labor, Bureau of Labor Statistics, August 1948 (2 pp.). Some basic data published in the International Shoe and Leather Weekly. Vol. 117, No. 7, February 12, 1949 (pp. 20-25). o. p.

Indexes of production, production workers, man-hours, output per production worker and per man-hour.

1.180. Productivity in the Shoe Industry. George E. Sadler and Lewis H. Earl. Leather and Shoes, The International Shoe and Leather Weekly, February 19, 1949 (pp. 17-18 ff.).

A study covering a 7-year period for selected types of shoes.

1.181. Productivity in the Shoe Industry. National Shoe Manufacturers Association, Inc., News Bulletin, March 9, 1956 (2 pp.).

Shoe industry's real profits as related to productivity increases and wage increases, 1947-55.

1.182. The Shoe Industry's Rising Productivity, A 30-Year Record and Its Significance. Boot and Shoe Workers' Union, AFL-CIO, Economics Research Division, March 1956 (12 pp.).

A study designed to enable the shoe industry to better evaluate its productivity record of progress. Includes productivity trends, 1925-55.

1.183. Time and Labor Costs in Manufacturing 100 Pairs of Shoes, 1923. U. S. Department of Labor, Bureau of Labor Statistics, July 1924, Bull. No. 360 (154 pp.).

Time and labor cost reports furnished BLS by representative shoe manufacturers located in 9 of the important shoe-producing States.

1.184. Trends in Man-Hours Expended per Unit Selected Footwear, 1939-45. Lewis H. Earl and David Schenker. U. S. Department of Labor, Bureau of Labor Statistics, March 1948 (71 pp.). Supplements: 1939-47, May 1950 (73 pp.); 1947-48, October 1950 (25 pp.); 1939-50, May 1952 (13 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.185. Trends in Man-Hours Expended per Unit Selected Types of Leather, 1939-46. Benjamin D. Kaplan. U. S. Department of Labor, Bureau of Labor Statistics, April 1948 (44 pp.). Supplements: 1946-48, March 1950 (15 pp.); 1948-50, October 1951 (17 pp.); 1950-51, October 1952 (7 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.186. Trends in Man-Hours Expended per Unit Selected Types of Luggage, 1945-48. Frank M. Tucker. U. S. Department of Labor, Bureau of Labor Statistics, August 1950 (11 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

12. Stone, clay, and glass products

1.187. Cement. Chapter from Minerals Yearbook (Annual). U. S. Department of the Interior, Bureau of Mines.

Output in Portland-Cement Industry per man per shift and per hour by type of operator (Mill: finished Portland-cement; quarry and crusher; quarry rock handled) by district. Latest data given for 1949, in 1952 chapter.

1.188. Labor Requirements for Construction Materials. Part I. Portland Cement, Bulletin 888-1, 1947 (21 pp.); Part II. Concrete Masonry Units, Bulletin 888-2, 1947 (16 pp.); Part III. Concrete Pipe, Bulletin 888-3, 1947 (8 pp.). U. S. Department of Labor, Bureau of Labor Statistics.

Variations in man-hours by rate of operation, plant capacity and by geographic areas from data collected through a field study, 1945 and 1946.

1.189. Labor Requirements for Gypsum Wall Plaster and Board. Adela L. Stucke. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1947 (pp. 453-456).

The development of the gypsum industry and factors affecting unit labor requirements and the levels of man-hours expended in the production of one ton of each product.

1.190. Labor Requirements in Cement Production. Bernard H. Topkis. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1936 (pp. 564-577).

The manufacturing process for portland cement and estimates of the man-hours required to transport the raw materials and supplies and to produce the cement. The study is based on records of 102 plants in 1934.

1.191. Labor Requirements in Cement Production. Alfred W. Collier. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1946 (pp. 355-363).

Summary of "Labor Requirements for Construction Materials, Part I, Portland Cement," Bulletin 888-1.

1.192. Labor Requirements in Production and Distribution of Concrete Masonry Units and Concrete Pipe. Alfred W. Collier. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1946 (pp. 681-691).

"Labor Requirements for Construction Materials, Part II, Concrete Masonry Units" and "Part III, Concrete Pipe," published by the Bureau as Bulletins 888-2 and 888-3, are summarized.

1.193. Labor Requirements: Sand and Gravel and Ready-Mixed Concrete. Adela L. Stucke. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1948 (pp. 630-635).

Factors affecting unit labor requirements, levels of man-hours expended per 100 tons for each product and major operation, and a comparison of 1946-47 levels with those of 1937.

1.194. Labor Requirements to Produce Home Insulation. Carl R. Taylor and Benjamin Lavine. U. S. Department of Labor, Bureau of Labor Statistics, 1947, Bull. 919 (19 pp.).

Manufacturing processes and man-hours per unit of product at each production level, from mining or growing the raw material to transporting the finished product for 3 types.

1.195. Mechanization in the Brick Industry. A. J. Van Tassel and D. W. Bluestone. United States Works Progress Administration, National Research Project, June 1939, Report No. M-2 (83 pp.).

Changes in production techniques in the brick industry for the past 50 years. The field data were collected in 1936 in cooperation with the National Bureau of Economic Research.

1.196. Mechanization in the Cement Industry. S. T. Woal and H. Schimmel. United States Works Progress Administration, National Research Project, December 1939, Report No. M-3 (113 pp.).

The major technological developments since 1919 and the effects upon labor requirements. Indexes of man-hour requirements, 1920-36, by department.

1.197. Productivity and Employment in Selected Industries: Brick and Tile. Miriam E. West. United States Works Progress Administration, National Research Project, February 1939, Report No. N-12 (212 pp.). o. p.

Data based on plant records, includes a description of the industry and the production processes; location, size and number of plants; volume and trend of employment; trade organization and practices; and prices and their effects on productivity.

1.198. Productivity Costs in the Common-Brick Industry. William F. Kirk. U. S. Department of Labor, Bureau of Labor Statistics, October 1924, Bull. No. 356 (71 pp.).

Data on man-hour and labor costs from the records of 79 manufacturers of common building brick in 23 states, 1922 and 1923.

1.199. Productivity in the Cement Industry: 1939-49. Daniel J. Swist and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, July 1950 (5 pp.). Supplement: 1939-50 (5 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.200. Productivity in the Clay Construction Products Industry, 1939-48. Bernard Michael and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, May 1950 (6 pp.). Supplements: 1939-49, January 1951 (8 pp.); 1939-50, November 1951 (11 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.201. Productivity in the Glass Products Group. U. S. Department of Labor, Bureau of Labor Statistics, August 1948 (2 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.202. Productivity in the Portland-Cement Industry. A. W. Frazer and L. A. Epstein. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1946 (pp. 355-363).

Indexes of production, employment, man-hours, payrolls, capacity and unit labor cost, 1919-40, and factors affecting productivity.

1.203. Productivity of Labor in the Glass Industry. Boris Stern. U. S. Department of Labor, Bureau of Labor Statistics, 1927, Bull. No. 441 (204 pp.).

The change from hand methods to semiautomatic and automatic processes in the glass industry. Comparison of output per man-hour and labor cost by process for bottles and jars, pressed and blown ware, window glass, and plate glass.

1.204. Productivity Trends in the Glass Container Industry, 1935-51. Daniel J. Swist and Elmer S. Persigehl. U. S. Department of Labor, Bureau of Labor Statistics, September 1952 (10 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.205. Sand and Gravel. Chapter from Minerals Yearbook (Annual). U. S. Department of the Interior, Bureau of Mines.

Output in commercial operations per man per shift and per hour by district.

13. Metal industries

1.206. Blast Furnace Productivity in the United States. Ethelbert Stewart. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1928 (pp. 1123-1126).

Indexes of blast furnace output per man-year, 1850-1926, and the effect upon employment of the productivity changes.

1.207. Cost of Production: Iron, Steel, Coal, Etc. Carroll D. Wright. U.S. Department of Labor, Bureau of Labor Statistics, Sixth Annual Report of the Commissioner of Labor Statistics, 1890 (1404 pp.).

Pioneer work on unit labor costs in steelmaking and related industries.

1.208. Employment and Productivity in a Sheet Steel Mill. Jennette R. Gruener. Downs Printing Co., 1938 (86 pp.).

Analysis of problems encountered by one steel mill in order to discover the changing relations of various factors such as production, employment, productivity, and labor costs, 1919-33.

1.209. Improving Productivity in a Wire Mill. Charles C. Tappeno. Blast Furnace and Steel Plant, January 1956, Vol. 44, No. 1 (pp. 69-72).

The results of time studies, etc. to meet the demands for increasing productivity.

1.210. Labor Productivity. G. F. Sullivan. The Iron Age, January 1947 (pp. 109-115).

Results from a questionnaire survey sent to 653 metalworking plants, to determine the state of labor productivity in 1946, as compared with the prewar level.

1.211 Labor Productivity in Copper Refining. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1927 (pp. 30-33).

Based on employment and output data from a large copper refining company in 1918 and in 1927.

1.212. Man-Hour Productivity in the Blast-Furnace Industry in 1929. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1932 (pp. 260-267).

Output per man-hour, unit labor cost, and hourly earnings by State and by size of plant and factors affecting productivity.

1.213. Man-Hours of Labor per Unit of Output in Steel Manufacture. Bernard H. Topkis and H. O. Rogers. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1935 (pp. 1155-1161).

Man-hour requirements for semifinished and finished steel products based on the experience of 15 representative steel mills. Labor requirements in manufacturing, mining and transporting the iron ore, coal, fluxing agents, and ferroalloys.

1.214. Man-Hours per Unit of Output in the Basic Steel Industry, 1939-55. Allan D. Searle and Staff. U. S. Department of Labor, Bureau of Labor Statistics, September 1956, BLS Bull. 1200 (40 pp.).

Productivity trends, factors such as technological change, volume, capacity utilization, etc., which affect productivity and concepts and measurement.

1.215. Output per Man-Hour in Basic Steel. Maurice Haven and Allan D. Searle. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1956 (pp. 1276-1280).

A condensation of "Man-Hours per Unit of Output in the Basic Steel Industry, 1939-55," BLS Bull. 1200, 1956.

1.216. Productivity in the Alumina and Aluminum Industries: 1941-1943, U. S. Department of Labor, Bureau of Labor Statistics, October 1943 (5 pp.).

Indexes of production, employment, man-hours, payrolls, productivity, and unit labor cost by months for January 1942-July 1943.

1.217. Productivity in the Blast Furnace and Open Hearth Segments of the Steel Industry, 1920-46. William T. Hogan. New York: Fordham University Press, 1950 (150 pp.).

Statistics on output and labor with an evaluation of important technological changes.

1.218. Productivity in the Light Flat-Rolled Segment of the Steel Industry. Thomas F. Walsh. New York: Fordham University Press, 1953 (64 pp.).

An analysis of one representative plant and conclusions that may prove applicable to other plants of this type.

1.219. Productivity in the Primary Smelting and Refining of Copper, Lead and Zinc, 1939-48. Bernard Michael and Mary L. Kelly. U. S. Department of Labor, Bureau of Labor Statistics, April 1950 (6 pp.). Supplements: 1939-49, June 1950 (7 pp.); and 1939-50, June 1952 (7 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.220. Productivity of Labor in Merchant Blast Furnaces. U. S. Department of Labor, Bureau of Labor Statistics, December 1928, Bull. No. 474 (145 pp.).

Productivity by occupation and by labor groups, by plant in each region, 1916-23, based on company records.

1.221. Productivity of Labor in the Sheet Department of the Iron and Steel Industry. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1932 (pp. 19-26).

Indexes of average output per man-hour and of man-hours per net ton of output are based on a field study of the principal operations in standard sheet mills, 1925 and 1929.

1.222. Productivity Trends in Gray Iron Foundries, 1946-50. Theodore H. Allegri. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, April 1952 (pp. 404-406).

Indexes of unit man-hours for product groups, 1946-50.

1.223. The Real Danger of High Costs. Plato Malozemoff. Engineering and Mining Journal, November 1949 (8 pp.).

Suggested methods for reducing costs and increasing productivity in the nonferrous metal industries.

14. Machinery (except electrical)

1.224. Agricultural Equipment Financing. Howard G. Diesslin. National Bureau of Economic Research, Occasional Paper, No. 50, 1953 (95 pp.).

Farm equipment selling, 1920-53, and the relationship between decrease in farm labor force and increase in productivity.

1.225. Construction Machinery, Unit Man-Hour Trends, 1945-57. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1948 (pp. 618-619).

A summary of "Trends in Man-Hours Expended per Unit, Selected Types of Construction Machinery, 1939-47," published by the Bureau of Labor Statistics.

1.226. Labor Requirements in Production and Distribution of Plumbing and Heating Supplies. Bernard H. Topkis. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1938 (pp. 1381-1386).

The 1935 man-hour requirements for the production and distribution of a variety of the plumbing and heating supplies used in typical 6-room dwellings.

1.227. Man-Hours Expended per Unit: Selected Construction Machinery, 1939 to 1945. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1947 (pp. 41-47).

Summary of the report, "Trends in Man-Hours Expended per Unit: Selected Types of Construction Machinery, 1939-1945."

449922 O - 58 - 4

1.228. Man-Hours Expended per Unit: Selected Machine Tools, 1939-1945. Kenneth A. Middleton. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1947 (pp. 186-192).

Summary of the report, "Trends in Man-Hours Expended per Unit: Selected Machine Tools, 1935-1945."

1.229. Redesign Pays Off in Higher Productivity. W. G. Patton. Iron Age. April 1, 1954 (pp. 140-142).

The progress report of a builder of special machine tools.

1.230. Trends in Man-Hours Expended per Unit: Selected Types of Construction Machinery, 1939-1945. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, July 1947 (54 pp.). Supplements: 1939-47, January 1949 (49 pp.); 1947-48, March 1950 (12 pp.); 1948-49, January 1952 (16 pp.); Selected Types of Construction and Mining Machinery, 1949-50 (12 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.231. Trends in Man-Hours Expended per Unit: Selected Machine Tools, 1939, 1945. Kenneth A. Middleton. U. S. Department of Labor, Bureau of Labor Statistics, June 1947 (56 pp.). Supplements: 1939-1947, November 1948 (37 pp.); 1947-48, April 1950 (9 pp.); 1948-49, January 1951 (19 pp.); 1949-50, June 1952 (5 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.232. Trends in Man-Hours Expended per Unit: Selected Metal Forming Machinery, 1939-1949. Matilda Sugg. U. S. Department of Labor, Bureau of Labor Statistics, February 1952 (27 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.233. Trends in Man-Hours Expended per Unit: Selected Types of Industrial Equipment, 1939-45. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, April 1948 (71 pp.). Supplements: 1945-47, March 1950 (19 pp.); 1947-48, April 1950 (6 pp.); 1948-49, February 1952 (9 pp.); 1949-50, May 1952 (6 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.234. Trends in Man-Hours Expended per Unit: Selected Types of Mining Machinery, 1939-1949. John H. Linton and Robert T. Kinsley. U. S. Department of Labor, Bureau of Labor Statistics, February 1952 (44 pp.). Supplement: Selected Types of Construction and Mining Machinery, 1949-50, May 1952 (12 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.235. Unit Man-Hour Requirements, Selected Machine Tools, 1939-1947. Benjamin D. Kaplan. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1948 (pp. 615-617).

Summary of "Trends in Man-Hours Expended per Unit: Selected Machine Tools, 1939-1947."

1.236. Unit Man-Hour Trends in Three Machinery Industries. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1950 (pp. 645-648).

Summary of three industry reports for 1947-48: Machine Tools, Industrial Equipment, Construction Machinery, published by the U. S. Department of Labor, Bureau of Labor Statistics.

15. Electrical machinery, equipment and supplies

1.237. Labor Requirements in the Manufacture and Distribution of Electrical Products. Bernard H. Topkis. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1939 (pp. 559-563).

Man-hours per $1,000 of electrical machinery, apparatus and supplies produced and distributed in the United States in 1937 for 13 major groups of electrical products.

1.238. Technological Changes and Employment in the Electric Lamp Industry. Witt Bowden. U. S. Department of Labor, Bureau of Labor Statistics, 1933, Bull. No. 593 (62 pp.).

The growth of the industry and problems of estimating the effects of technological changes on employment, 1920-30. Indexes of output per man-hour, output, and employment are included.

1.239. Trends in Man-Hours Expended per Unit: Electrical Equipment and Supplies, 1939-1947. Lewis H. Earl and Thayer D. Moss. U. S. Department of Labor, Bureau of Labor Statistics, April 1950 (42 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.240. Trends in Man-Hours Expended per Unit: Home Radio Receivers, 1939-1947. Benjamin D. Kaplan and Walter Hirsch. U. S. Department of Labor, Bureau of Labor Statistics, May 1950 (56 pp.). Supplements: Television and Radio Sets, 1947-49, July 1951 (21 pp.); 1949-50, October 1952 (4 pp.).

Man-hours per unit of product for individual products and for groups of products of plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.241. Trends in Man-Hours Expended per Unit: Household Electrical Appliances, 1939-1947. Benjamin D. Kaplan and Walter Hirsch. U. S. Department of Labor, Bureau of Labor Statistics, April 1950 (77 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.242. Unit Man-Hour Requirements: Home Radio Receivers, 1939-47. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1950 (p. 517).

Summary of Trends in Man-Hours Expended per Unit: Home Radio Receivers.

1.243. Unit Man-Hour Trends, 1939-1948, Household Electrical Appliances. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1950 (pp. 122-125).

Summary of Trends in Man-Hours Expended per Unit: Household Electrical Appliances, 1939-47 and its supplement for 1947-48.

16. Transportation equipment

1.244. Indexes of Labor Requirements for Selected Shipbuilding Programs. U. S. Department of Labor, Bureau of Labor Statistics, July 1945 (12 pp.).

Indexes of average man-hour requirements and average time elapsed between keel-laying and delivery for selected types of vessels included in the shipbuilding programs of the Maritime Commission and the Navy Department.

1.245. Mechanization Trends in Material Handling. D. J. Davis, Ford Motor Company. Milwaukee: Industrial Materials Handling and Packaging Conference, January 17, 1956.

Ford Motor Company's methods of achieving a higher level of productivity through automation and other factors.

1.246. Productivity Changes in Selected Wartime Shipbuilding Programs. Allan D. Searle. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1945 (pp. 1132-1147).

Man-hours per vessel and on time elapsed between keel-laying and delivery for liberty ships, victory ships, selected types of other cargo vessels, tankers, and destroyer-escort vessels. Time series and learning curves analysis.

1.247. Projecting Labor Loads in Aircraft Production. P. B. Crouse. Aero Digest, October 1943 (pp. 216-243). Also in Aircraft Production, August 1943 (pp. 22-34).

The use and effect of learning curves as an adjunct to labor load projection in aircraft manufacture.

1.248. Trends in Man-Hours Expended per Car: Selected Types of Railroad Freight Cars, 1939-1948. Thayer David Moss. U. S. Department of Labor, Bureau of Labor Statistics, November 1950 (23 pp.).

Man-hours per unit of product for individual products and for groups of products for plants grouped by plant size, production method, capacity utilization, etc., based on direct plant reports.

1.249. Wartime Productivity Changes in the Airframe Industry. K. A. Middleton. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1945 (pp. 215-225).

Analysis of the reduction in man-hours per pound of airframe for individual plants producing various types of planes, January 1942 to May 1945. Time series and learning curves analysis.

E. Mining

1. Total mining and combinations of mining industries

1.250. Capital and Output Trends in Mining Industries, 1870-1948. Israel Barenstein. New York: National Bureau of Economic Research, 1954, Occasional Paper 45 (81 pp.).

A detailed examination of trends since 1870 in the ratio of capital output in the mining industries of the United States, including comparisons of capital-product ratio with capital per unit of labor and product per unit of labor.

1.251. Employment, production, Wage and Safety Statistics in the Mining Industry, 1939-1946. Washington: U. S. War Production Board and Civilian Board and Civilian Production Administration, April 1947 (189 pp.). o.p.

Data by type of production on employment, labor turnover, absenteeism, average weekly hours, average hourly and weekly earnings; mine accident data; mine production data; primary smelter and refinery production; and productivity (output per worker).

1.252. Minerals Yearbook (Annual). U. S. Department of Interior, Bureau of Mines. Published annually since 1933. Successor to "Mineral Resources of the United States."

Includes statistics on productivity for various mining industries--coal, cement, sand and gravel. See listings under individual products.

1.253. Mining Industries, 1899-1939, a Study of Output, Employment and Productivity. Harold Barger and Sam Schurr. New York: National Bureau of Economic Research, 1944 (452 pp.).

Indexes of output, employment and productivity for total mining, total metal, iron, copper, other nonferrous metals, total coal, Pennsylvania anthracite, bituminous coal, oil and gas, total stone, gypsum, and phosphate rock.

1.254. Productivity and Unit Labor Cost in Selected Mining Industries: 1935-1945. U. S. Department of Labor, Bureau of Labor Statistics, June 1946 (9 pp.).

Indexes of production, employment, man-hours, output per man-hour, payrolls, and unit labor cost for anthracite, bituminous coal, crude petroleum and natural gas, iron, copper, and lead and zinc.

1.255. Trends in Output per Man-Hour in Mining, 1935-1949. Allan D. Searle and Harriet S. Taylor. U. S. Department of Labor, Bureau of Labor Statistics, August 1950 (40 pp.).

Industries include bituminous coal, anthracite, copper, iron, lead and zinc, crude petroleum, natural gas, and natural gasoline.

2. Coal mining

1.256. An Analysis of Coal-Mine Labor Productivity. Ethelbert Stewart. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1930 (pp. 37-39).

Output per man-day for the principal mine occupations, by States, for bituminous coal and for Pennsylvania anthracite.

1.257. Bituminous Coal Wages, Profits, and Productivity. Jules Backman. Prepared for Southern Coal Producers Association and presented before Presidential Coal Board, 1950 (128 pp.).

The criteria which determine wage changes. Comparison of real wages in coal mining and other industries. The relationship between wages and productivity in the industry and in the economy as a whole.

1.258. Building for 1960. Coal Age, September 1956 (pp. 54-58).

Raising tons per man is discussed by producing organizations in their plan to meet rising coal demands.

1.259. Coal--Bituminous and Lignite. Chapter from Minerals Yearbook (Annual). U. S. Department of the Interior, Bureau of Mines.

Output per man, per day, and per year. Trend data and data by type of mine, by State and county.

1.260. Coal--Pensylvania Anthracite. Chapter from Minerals Yearbook (Annual). U. S. Department of the Interior, Bureau of Mines.

Output per man, per day, and per year. Trend data and data by region and type of plant.

1.261. Employment in relation to Mechanization in the Bituminous Coal Industry. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1933 (pp. 256-278).

Productivity changes brought about by the introduction of mechanical loading in a small group of mines in Illinois, Pennsylvania and Wyoming.

1.262. Injury Experiences in Coal Mining, Analysis of Mine Safety Factors, Related Employment, and Production Data. Annual Bulletins, U. S. Department of the Interior, Bureau of Mines. Technical paper 1911-12. Annual bulletin, 1913-42 and from 1948 forward.

Output per man-hour for bituminous coal and Pennsylvania anthracite mines.

1.263. Measuring Productivity in Coal Mining, 1919-1948. Charles M. James. University of Pennsylvania Press, Wharton School of Finance and Commerce, Industrial Research Department, Research Report No. 13 March 1952, (96 pp.).

Productivity measurement in bituminous coal mining, and factors influencing productivity, 1919-48.

1.264. Mechanization, Employment and Output per Man in Bituminous Coal Mining. W. E. Hotchkiss and Others. United States Work Progress Administration, National Research Project, August 1939, Report No. E-9, Vol. 2 (435 pp.). o. p.

Deals with the introduction of mechanization for loading coal into the pit cars underground. Production, employment and net tons per man-day, 1890-1937.

1.265. Output per Man-Shift. Coal Age, November 1942, Vol. 47 (pp. 69-70).

Tons per man-shift in relation to seam thickness

1.266. Pond Creek Productivity Upped. J. H. Edwards. Coal Age, December 1947 (pp. 82-85).

Changes in working plans, and technological improvements that have accounted for productivity increases at Pond Creek Colliery of Norfolk and Western Railway Company in West Virginia.

1.267. Productivity in the Anthracite Mining Industry, 1935-1948. Allan D. Searle and Harriet S. Taylor. U. S. Department of Labor, Bureau of Labor Statistics, April 1950 (6 pp.). Supplement: 1935-50, March 1952 (6 pp.).

Indexes of production, employment, man-hours, productivity and unit labor requirements, with influencing factors.

1.268. Productivity in the Bituminous Coal Mining Industry, 1935-1948. Allan D. Searle and Harriet S. Taylor. U. S. Department of Labor, Bureau of Labor Statistics, May 1950 (8 pp.).

Indexes of production, employment, man-hours, productivity and unit labor requirements with influencing factors

3. Other mining

1.269. Changes in Technology and Labor Requirements in the Crushed Stone Industry. Harry S. Kanter and Goeffrey A. Saeger. United States Work Progress Administration, National Research Project, February 1939, Report No. K-8 (169 pp.). o.p.

Technological changes, 1900-1937 in quarrying, underground mining, and crushing plants. Bureau of Mines data on employment, production, and output per man for crushed stone operations by States and for the United States as a whole are presented for the years 1915-36.

1.270. Labor Requirements in production and Distribution of Sand and Gravel. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1939 (pp. 87-91).

Unit man-hour requirements by type of operation in 1937 based on the records of 24 plants.

1.271. Lead and Zinc Mining and Milling in the United States. C. F. Jacobson, J. B. Knaebel and C. A. Wright. U. S. Department of the Interior, Bureau of Mines, 1939, Bulletin 381 (204 pp.).

Man-hours per ton of ore treated, by department for 7 representative lead and zinc concentrators.

1.272. Mineral Technology and Output per Man-Studies: Rock Drilling. C. E. Nighman and O. E. Kiessling. United States Work Progress Administration, National Research Project, February 1940, Report No. E-11 (158 pp.). o.p.

The principal improvements made from 1865 to 1939 in the rock drills used in metal mining and in quarrying. The influence of changing drilling technology on the volume of employment, on occupations and skills and on health safety.

1.273. Production, Employment and Output per Man-in Gypsum Mining. R. Newcomb and K. Peterson. U. S. Department of the Interior, Bureau of Mines, 1940, Information Circular No. 7134 (17 pp.).

Data by States, 1925-38, and for the United States, 1911-38. Trends since 1860 are indicated.

1.274. Production, Employment, and Productivity in the Mineral Extractive Industries, 1880-1938. Vivian G. Spencer. Unites States Work Progress Administration, National Research Project, June 1940, Report No. S-2 (168 pp.). o.p.

Indexes for all mineral extraction, for 4 groups of industries and 19 individual industries.

1.275. Productivity and Unit Labor Cost in the Lead and Zinc Mining Industry, 1935-49. Allan D. Searle and Harriet S. Taylor. U. S. Department of Labor, Bureau of Labor Statistics, June 1950 (7 pp.) Supplement: 1939-50, March 1952 (8 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.276. Productivity in the Copper Ores Mining Industry, 1935-49. Allan D. Searle and Harriet S. Taylor. U. S. Department of Labor, Bureau of Labor Statistics, June 1950 (5 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.277. Productivity in the Iron Mining Industry, 1935-48. Allan D. Searle and Harriet S. Taylor. U. S. Department of Labor, Bureau of Labor Statistics, May 1950 (6 pp.).

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.278. Recent Productivity Changes in Copper Mining. M. C. Heins and K. A. Middleton. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1943 (pp. 258-264).

Indexes of production, employment and productivity, 1935 to 1942, and factors affecting productivity, particularly in the war period.

1.279. Recent Productivity Changes in Lead and Zinc Mining. K. A. Middleton. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1943 (pp. 1116-1122).

Wartime efforts to increase productivity.

1.280. Technology, Employment, and Output per Man in Copper Mining. S. Leong and others. United States Work Progress Administration, National Research Project, February 1940, Report No. E-12 (260 pp.). o.p.

Production, employment, and output per worker, 1880-1936. Factors affecting productivity, particularly advances in technology in the mining of less accessible ores.

1.281. Technology, Employment and Output per Man in Iron Mining. N. Yaworski, and others. United States Work Progress Administration, National Research Project, June 1940, Report E-13 (264 pp.). o. p.

Long-time trends in employment, production, and productivity and factors affecting productivity.

1.282. Technology, Employment and Output per Man in Petroleum and Natural Gas Production. O. E. Kiessling and others. United States Work Progress Administration, National Research Project, July 1939, Report No. E-10 (346 pp.). o. p.

Productivity indexes in crude petroleum, natural gas, and natural gasoline production; in petroleum refining; and in pipeline transportation, 1889-1937. Technology and physical conditions of operations are discussed.

1.283. Technology, Employment and Output per Man in Phosphate-Rock Mining. A. Porter Haskell, Jr. and O. E. Kiessling. United States Work Progress Administration, National Research Project, November 1938, Report N-1 (130 pp.). o. p.

Employment, production and output per man for underground phosphate rock mines 1922-37 and for Florida Long-Pebble Phosphate, 1919-37. Technological improvements and factors affecting productivity.

F. Transportation, Communication, and Public Utilities

1.284. Increasing Output per Worker and Decreasing Wage Cost per Unit of Output. Leo E. Keller. Exhibit No. 10 before the President's National Emergency Board, Washington, D. C., October 1938 (40 pp.). o. p.

Data for railroad transportation (passenger and freight) maintenance of way, telegraphic services, and maintenance of equipment, based on statistics from Interstate Commerce Commission.

1.285. Labor Productivity and Displacement in the Electric Light and Power Industry. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1932 (pp. 249-259).

Technological changes and their effects upon labor, covering 10 representative electric power companies or systems.

1.286. Labor Requirements in Rail Transportation of Construction Materials. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1937 (pp. 846-853).

Man-hours required for transportation to building sites in 1935 for 16 construction materials.

1.287. Output and Productivity in the Electric and Gas Utilities, 1899-1942. Jacob Martin Gould. New York: National Bureau of Economic Research 1946 (195 pp.).

Production, employment and productivity and factors underlying the improvement in productivity.

1.288. Productivity and Displacement of Labor in Ticker Telegraph Work. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1932 (pp. 1269-1277).

Tables in the New York Stock Exchange Yearbook are used to derive productivity indexes for the years 1890-1930. The effect of the introduction of the high-speed ticker on employment in the telegraph industry.

1.289. Productivity and Unit Labor Cost in the Electric Light and Power Industry, 1917-1945. U. S. Department of Labor, Bureau of Labor Statistics, July 1946 (4 pp.).

Indexes of production, total employment, man-hours, payrolls, productivity, and unit labor cost.

1.290. Productivity and Unit Labor Cost in Steam Railroad Transportation: 1935-1945. U. S. Department of Labor, Bureau of Labor Statistics, May 1946 (4 pp.).

Indexes of productivity and unit labor cost for Class I steam line-haul railroads.

1.291. Productivity and Unit Labor Cost in the Telephone and Telegraph Industries: 1935-1945. U. S. Department of Labor, Bureau of Labor Statistics, August 1946 (5 pp.). Supplement: 1935-47, January (3 pp.).

Indexes of production, employment, output per employee, payrolls, and unit labor cost.

1.292. Productivity, Hours, and Compensation of Railroad Labor, 1933 to 1936. Witt Bowden. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1937 (pp. 68-77).

Indexes of output per man-hour for Class I railroads and principal terminal companies. Production is measured in terms of revenue-traffic units.

1.293. Productivity in Railroad Labor. W. H. Dunlap. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1927 (pp.471-478).

Indexes of traffic units per man-hour, 1915-26, for all employees and for train and engine crews.

1.294. Productivity in Railroad Transportation, 1935-51. Bernard Michael. U. S. Department of Labor, Bureau of Labor Statistics, June 1952 (12 pp.).

Trends in revenue traffic (freight and passenger) per man-hour of work. Indexes of revenue traffic, railroad employees, man-hours, and revenue traffic per employee and per man-hour and factors affecting productivity.

1.295. Productivity in Electric Energy Generation. C. S. Gody and L. M. Walsh. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1944 (pp. 25-31.).

Output of electric energy is compared with labor employed at generating stations, 1937-42.

1.296. Productivity in Electric Energy Generation: 1937-1942. U. S. Department of Labor, Bureau of Labor Statistics, October 1943 (6 pp.).

Indexes of generating capacity per employee, output per kilowatt of capacity, output per employee in terms of kilowatt-hours, and estimates of total employment at generating stations for hydroelectric and fuel plants.

1.297. Productivity in the Electric Light and Power Industry, 1917-1948. U. S. Department of Labor, Bureau of Labor Statistics, December 1949 (7 pp.). o.p.

Indexes of production, production workers, man-hours, output per production worker and per man-hour and an analysis of some factors affecting trend changes.

1.298. Some Considerations in the Measurement of Productivity of Railroad Workers. Herbert Ashton. Journal of Political Economy, October 1938 (pp. 714-720).

An analysis of "Productivity Hours and Compensation of Railroad labor."

1.299. The Transportation Industries, 1889-1946: A Study of Output, Employment, and Productivity. Harold Barger. New York: National Bureau of Economic Research, 1951 (288 pp.).

Progress in the industry, types of transportation, and trends in output and employment. Indexes of output for steam railroads, electric railways, pipelines, waterways, and airlines.

1.300. Wartime Labor Productivity in Railroad Transportation. K. A. Middleton. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1943 (pp. 444-451).

Productivity measures 1935-42 and the effect on productivity of utilization of car capacity, shortages of new equipment, and labor skill.

G. Other Industries

1.301. Changing Output per Person Employed in Trade, 1900-1940. R. R. Griffin. Journal of Marketing, October 1947, Vol. 12 (pp. 242-245).

Estimate of productivity in trade.

1.302. Distribution's Place in the American Economy since 1869. Harold Barger. New York: National Bureau of Economic Research, 1955 (222 pp.).

Significant changes that have taken place in distribution--in its output of service, in its share of the labor force, in productivity, in costs, and in relative importance of wholesale and retail trade.

1.303. Effects of Technological Changes Upon Employment in the Amusement Industry. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1931 (pp. 261-267).

The effect of the introduction of sound pictures on employment in the industry.

1.304. Effects of Technological Changes Upon Employment in the Motion Picture Theaters of Washington, D. C., U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1931 (pp. 1001-1018).

The employment situation in 1931 with analysis of changes caused by the installation of sound equipment.

1.305. Effects on Employment of the Printer Telegraph for Handling News. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, April 1932 (pp. 753-758).

The effects of the introduction of printer telegraph on productivity.

1.306. Increased Productivity by Integration of Forest and Wood Utilization. Reavis C. Sproull. Paper Industry, May 1954 (pp. 139-140).

How more than one marketable product can be made from a unit of forest.

1.307. Increased Productivity in the Construction of Liberty Vessels. Frances J. Montgomery. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1953 (pp. 861-884).

Presentation and analysis of indexes of unit man-hour requirements and time requirements for vessels delivered, December 1941-April 1943.

1.308. Productivity in Government and the Output of Government Services. Solomon Fabricant. New York: National Bureau of Economic Research, Inc., No. 56, 1952. The Trend of Government activity in the United States Since 1900 (pp. 84-111).

Chapter five deals with the government's use of resources and the services into which they are transformed--government's productivity, and the volume of services rendered.

1.309. Productivity of Labor in Loading and Discharging Ship Cargoes. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1931 (pp. 255-283).

Output per man-hour and per gang-hour for the handling of general cargo and a number of individual commodities in the principal ports of the United States.

1.310. Technological Changes and Employment in the U. S. Postal Service. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, October 1932 (pp. 745-762).

Output per employee between 1908 and 1931 based on number of pieces of mail handled plus special service transactions.

SECTION II

PRODUCTIVITY AT THE PLANT LEVEL

2.001. Boosting Worker Productivity: 250% in 5 Years. Modern Industry (Now Dun's Review and Modern Industry), September 1946 (pp. 67-78).

The case history of a small plant in the "Deep South" which has boosted worker productivity, found new markets, improved employee morale by sound application of big-plant methods.

2.002. Case Study Data on Productivity and Factory Performance. A series prepared for the Foreign Operations Administration (now International Cooperation Administration), Productivity and Technical Assistance Division. U. S. Department of Labor, Bureau of Labor Statistics, 49 studies.

Each of the reports in this series presents man-hour requirements per unit of output during a selected period for a small group of United States plants manufacturing a specified product. Each report contains, a description of the product, the equipment, and the processes applicable to each plant, as well as information on layouts, material handling equipment and methods, staffing patterns, and operating policies. The reports listed in this series are designed mainly for use in highly industrialized countries:

Product	BLS Report No.	Year	Product	BLS Report No.	Year
Aluminum Ware (63 pp.)	48	Oct.1953	Dry Electrolytic Capacitors (70 pp.)	15	Mar.1953
Beet Sugar Refining (84 pp.)	6	Feb.1953	Farm Implements (251 pp.)	52	Apr.1954
Brick and Tile (85 pp.)	43	Oct.1953	Farm Tractors (182 pp)	38	Aug.1953
Centrifugal Pumps (59 pp.)	69	Oct.1954	Fertilizers (68 pp.)	63	May 1954
Coal Burning Space Heaters (110 pp.)	78	Dec.1954	Fine Cotton Gray Goods (94 pp.).	58	Feb.1954
Coarse Cotton Gray Goods (106 pp.)	16	Mar.1953	Five Small Gray Iron Foundries (188 pp.)	85	Apr.1955
Cold Formed Machine Nuts & Hexagon Nuts (72 pp.)	47	Oct.1953	5-Horsepower Induction Motors (142 pp.)	55	Feb.1954
Combines (159 pp.)	13	Feb.1954	Flourescent Lighting Fixtures (46 pp.)	-	Jan.1952
Copper Tube & Brass Rod (110 pp.)	81	Mar.1955	Fork Lift Trucks (120 pp.)	54	Feb.1954
Cotton Textile Dyeing and Finishing (151 pp.)	66	Jun.1954	Fractional Horsepower Motors (169 pp.)	23	May 1953
Diesel Engines (177 pp.)	86	Jun.1955	Glass Containers (103 pp.)	70	Oct.1954
Dome Reflectors (36 pp.)	-	Mar.1952			

Product	BLS Report No.	Year	Product	BLS Report No.	Year
Gray Iron Foundries (104 pp.)	-	Aug.1951	Pulp and Paper Mills (64 pp.)	-	Dec.1951
Hand Tools (106 pp.)	39	Sep.1953	Radio and Television Manufacturing (160 pp.)	-	Feb.1952
Irons, Hot Plates, & Space Heaters (211 pp.)	61	May 1954	Seamless Hosiery (105 pp.)	44	Jul.1953
Knit Outerwear (85 pp.)	40	Jul.1953	School Bus Bodies (114 pp.)	-	Feb.1952
Knit Underwear (142 pp.)	41	Jul.1953	Street Lighting Luminaires (57 pp.)	-	Nov.1952
Men's Bib Overalls & Men's Work Jackets (156 pp.)	-	Jan.1952	3-Pole Circuit Interupters and Safety Switches (84 pp.)	67	Jul.1954
Men's Dress Shirts (80 pp.)	-	Aug.1951	Veneer and Plywood (107 pp.)	37	Jul.1953
Men's Dress Shoes (71 pp.)	-	Aug.1951	Women's Dresses (111 pp.)	84	Apr.1955
Men's Winter Suits and Topcoats (261 pp.)	4	Jan.1953	Women's Dress Shoes-Cement Process (53 pp.)	-	Nov.1951
Men's Work Pants (65 pp.)	-	Dec.1951	Wood Furniture (158 pp.)	18	Nov.1954
Men's Work Shirts (50 pp.)	-	Dec.1951			
Metal Containers (95 pp.)	71	Oct.1954			
Paint and Varnish (90 pp.)	79	Dec.1954			
Power Laundries (64 pp.)	-	Dec.1951			
Processed Foods: Canned Vegetables (74 pp.)	8	Feb.1953			
Processed Foods: Preserves, Jams and Jellies (85 pp.)	57	Feb.1954			

2.003. Case Study Report on 3 Small Gray Iron Shops. Herman Rothberg. Modern Castings, January 1956 (pp. 41-56). Prepared by U. S. Bureau of Labor Statistics.

Condensed from the study of five small gray iron foundries listed under Case Studies on Plant Operations.

2.004. Cost Savings Through Standardization, Simplification, and Specialization. Prepared under the direction of Milton Lipton. A series prepared for Mutual Security Agency, later Foreign Operations Administration (now International Cooperation Administration), Productivity and Technical Assistance Division. U. S. Department of Labor, Bureau of Labor Statistics, 5 studies. o. p.

Each of the reports presents examples of applications by American firms of the principles of standardization reduction in variety, simplification and specialization through actual case studies. The reports listed are designed to be applied broadly by materials handling in other countries:

449922 O - 58 - 5

Product	Year	Product	Year
Building Industry (182 pp.)	1954	Electrically Operated Household Appliances (172 pp.)	Nov. 1952
Clothing Industry (57 pp.)	1954	Materials Handling Equipment (125 pp.)	1954
Containers (42 pp.)	1954		

2.005. Effectiveness of Factory Labor: South-North Comparisons. R. A. Lester. The Journal of Political Economy, University of Chicago Press, February 1946, Vol. 54 (pp. 60-75).

Comparison of selected plants. The basic data were obtained from a questionnaire answered by 47 firms in various manufacturing industries.

2.006. How to Trim Production Costs. Business Week, November 20, 1954 (pp. 54-56).

Productivity changes resulting from careful planning of production in product development.

2.007. How We Can Boost Productivity. Factory Management and Maintenance, October 1950 (pp. 68-73).

The report of a round table discussion by six production experts.

2.008. Increasing Productivity Through Simplification, Standardization, Specialization. U. S. Economic Cooperation Administration, (now International Cooperation Administration), Special Projects Branch, Technical Assistance Division, 1951. o. p.

The field manual describing the terms, the benefits and procedures to be followed in promoting their application.

2.009. Industrial Productivity Handbook. Mill and Factory, May 1947, Vol. 40, No. 5 (682 pp.).

Prepared to assist manufacturers in increasing output per man-hour. Part I shows how productivity and the standard of living have increased in the United States. Part II presents statements of outstanding leaders of labor and industry on the importance of increased productivity. Part III deals with methods of increasing productivity in the plant. The final section describes many types of industrial equipment, gives numerous case studies showing how specific companies increased productivity.

2.010. An Internal Measure of Productivity. Council for Technological Advancement, January 15, 1954 CTA Bulletin No. 18 (5 pp.).

The value of productivity ratios at the plant and company level.

2.011. Measuring Labor's Productivity. Andrew T. Court. Automotive and Aviation Industries, March 1, 1946, Vol. 94 (pp. 17, 43-44).

A General Motors' study of a plant producing a subassembly is given as evidence of decreased postwar productivity.

2.012. Methods of Increasing Labor Productivity in Multi-Story and Small One-Floor Grocery Warehouses. U. S. Department of Agriculture, Marketing Research Division. Marketing Research Report No. 142, November 1956 (42 pp.).

Factors affecting productivity in receiving, assembling and loading operations, and systems used in improving productivity.

2.013. Methods of Increasing Productivity in Modern Grocery Warehouses. U.S. Department of Agriculture, Marketing Research Report No. 94, June 1955 (30 pp.).

Discusses productivity increases resulting from application of modern techniques in distribution.

2.014. Modern Industry (now Dun's Review and Modern Industry), August 1949. Complete issue.

Ideas, methods, and policies to stimulate productivity. The articles are grouped under the following headings: (1) Productivity in managing people; (2) Productivity in production; (3) Productivity in selling; and (4) Productivity in product development.

2.015. Plant Operation Report. A series prepared for the Foreign Operations Administration (now International Cooperation Administration), Productivity and Technical Assistance Division. U. S. Department of Labor, Bureau of Labor Statistics, 6 studies, 1954 and 1955. o. p.

Each of the reports in this series presents man-hour requirements per unit of output during a selected period for a small group of United States plants manufacturing a specific product. Each report contains a description of the product, the equipment, and the processes applicable to each plant, as well as information on layouts, material handling equipment and methods, staffing patterns, and operating policies. The reports listed in this series are designed mainly for use in underdeveloped countries:

	BLS Report No.	Year
Concrete Pipe and Block (50 pp.)	88	June 1955
Fish Netting (28 pp.)	90	June 1955
Meat Processing (60 pp.)	89	June 1955
Plows (66 pp.)	68	Sept 1954
Rubber Sole Fabric Shoes (28 pp.)	91	June 1955
Small Gray Iron Foundry (44 pp.)	53	Mar. 1954

2.016. A Plant-Wide Productivity Bonus in a Small Factory. Thomas Q. Gilson. and Myron J. Lefcowitz. Industrial Labor and Relations Review, January 1956 (pp. 284-296).

Study of an unsuccessful case of group incentive plans to provide for the sharing of gains to improve productivity in a small New Jersey ceramic plant.

2.017. Productivity in Chemical Plant Maintenance. Lyman A. Darling and Hugh A. Bogle. Chemical Engineering Progress, March 1954 (pp. 161-163).

The results of a methods-time-measurements study.

2.018. Productivity in the Chemical Industry. R. F. Brockart. Chemical Engineering Progress, April 1954 (pp. 173-176).

Measuring productivity in a chemical plant and the need for further improvement.

2.019. Productivity on the Upgrade. Betty Savesky. Commerce, September 1949 (p. 13 ff.)

Industry's drive for more output-per-man-hour through use of better tools and equipment and improved methods.

2.020. The Proper Approach and Solution to Wage Incentive Plan Problems. W. C. Zinck. Advanced Management, February 1954 (pp. 24-27).

Several solutions on how wage incentives may be applied to specific situations by a firm.

2.021. Scale of Output and Technical Organization of the Firm. F. E. Balderston. The Quarterly Journal of Economics, February 1955, Vol. 69 (pp. 45-70).

The difficulties in current theory of output determination, empirical tests of optimum scale and economies, and diseconomies of scale.

2.022. Socio-Psychological Factors in Productivity. R. Marricott. Occupational Psychology, January 1951, Vol. 25, No. 1 (pp. 15-24).

Case studies of four factories.

2.023. Uses of Productivity Data in American Manufacturing Establishments. George E. Sadler and Walter Hirsch. U. S. Department of Labor, Bureau of Labor Statistics, July 1949 (17 pp.).

Findings of a survey on the use of productivity data by American industrial establishments, prepared for Anglo-American Council on productivity.

2.024. What Are Present Industrial Productivity Trends? Mill and Factory, May 1953 (pp. 67-70).

A survey of industrial firms of all types and sizes, presenting some of the productivity trends apparent in American business today.

2.025. What is Happening to Labor Productivity? Mill and Factory Survey, Mill and Factory, March 1956 (pp. 71-74).

A survey of industrial firms of all types and sizes, highlights the trends in labor productivity.

2.026. The Will to Work: The Greatest Resource of American Industry. Phillips Bradley. Advanced Management, June 1948, Vol. 13 (pp. 65-72).

Means by which the worker can be induced to strive for greater productivity.

SECTION III

INTERNATIONAL

(Largely a section on international comparisons but also contains American publications pertaining to single foreign countries.)

3.001. Agricultural Productivity and Economic Development in Japan. B. F. Johnston. Journal of Political Economy, December 1951 (pp. 498-513).

Factors responsible for a doubling of labor productivity in agriculture from 1885 to 1915 in Japan, and a comparison of this rapid progress with that in the United Kingdom.

3.002. American Productivity and the Dollar Payments Problem. E. M. Bernstein. Review of Economics and Statistics, May 1955, Vol. 37 (pp. 101-109).

Effects of increased American productivity on the payment problems of other countries. The study relates productivity to competitive costs, United States exports, and imports, and terms of trade.

3.003. American Unions and U. S. Productivity. The Statist, November 14, 1953 (pp. 620-621).

Factors which make United States industrial productivity higher than that in any European country, emphasizing the great influence of unions' attitude in raising this level.

3.004. Anglo-American Productivity Difference: Their Magnitude and Some Causes. Marvin Frankel. American Economic Review, May 1955, Vol. XLV (pp. 99-138).

Compares productivity in 30 industries in the 2 countries, describing methods employed and the limitations of the findings, designed to throw light on the problem of what determines the productivity of any economy.

3.005. Anglo-American Productivity Team Reports. New York: The Anglo-American Council on Productivity. 50 Case Studies:

The Anglo-American Council on Productivity was formed in the autumn of 1948 on the initiative of Sir Stafford Cripps, the Chancellor of the Exchequer in Britain, and Mr. Paul Hoffman, the Economic Cooperation Administrator in the United States. It was composed of representatives of management and labor both in the United States and in the United Kingdom. The purpose of the council was to promote economic well-being by a free exchange of knowledge in the realm of industrial organization, method, and technique and thereby

to assist British industry to raise the level of productivity. The principal means adopted to achieve this end was to send to America industrial teams, the members of which were drawn in equal numbers from the supervisory, the technical, and the workshop levels. The business of the teams was to study American production methods, to report their observations and findings and to make recommendations. The activities of the council and the work of the United States section came to an end on June 30, 1952. The team reports were published by the Anglo-American Council, London and New York as follows:

Product	Year
The Brass Foundry (173 pp.)	1951
Brushes (54 pp.)	1951
Building (81 pp.)	1950
Cake and Biscuits (68 pp.)	1952
Coal (107 pp.)	1951
Cotton Spinning (121 pp.)	1950
Cotton Weaving (62 pp.)	1950
Cotton Yarn Doubling (88 pp.)	1950
Diesel Locomotives (51 pp.)	1950
Drop Forging (56 pp.)	1950
Education for Management (86 pp.)	1951
Electric Motor Control and Small Airbreak Switch Gear (40 pp.)	1950
Electricity Supply (129 pp.)	1950
Food Canning (86 pp.)	1952
Footwear (190 pp.)	1951
Freight Handling (58 pp.)	1951
Fruit and Vegetable Utilization (56 pp.)	1952
Furniture (73 pp.)	1952
The Hop Industry (113 pp.)	1951
Hosiery and Knitwear (52 pp.)	1951
Hot Dip Galvanizing of General Work (57 pp.)	1951
Internal Combustion Engines (83 pp.)	1950
Iron and Steel (147 pp.)	1952
Letterpress Printing (78 pp.)	1951
Lithographic Printing (120 pp.)	1951
Management Accounting (71 pp.)	1950
Materials Handling in Industry (52 pp.)	1950
Meat Packaging and Processing (72 pp.)	1951
Men's and Youths' Factory-Tailored Clothing (84 pp.)	1950
Metal Finishing (75 pp.)	1951
Non-ferrous Metals (Wrought) (96 pp.)	1951
Packet Foods (71 pp.)	1951
Packaging (58 pp.)	1950
Pharmaceuticals (669 pp.)	1951
Pressed Metals (52 pp.)	1950
Productivity in Farming (43 pp.)	1951
Productivity Measurement in British Industry (38 pp.)	1950
Rayon Weaving (65 pp.)	1949
Rigid Boxes and Cartons (38 pp.)	1951
Saving Scarce Materials (28 pp.)	1951
Simplification in British Industry (13 pp.)	1950
Simplification in Industry (12 pp.)	1949
Steel Construction (70 pp.)	1952
Steel Founding (108 pp.)	1949
Superphosphate and Compound Fertilizers (66 pp.)	1950
Training of Operatives (52 pp.)	1951
Training of Supervisors (56 pp.)	1951
Universities and Industry (29 pp.)	1951
Valves, Steel, Iron and Non-ferrous (64 pp.)	1951
Welding (74 pp.)	1951

3.006. Approaches to Economic Development. Norman S. Buchanan and Howard L. Ellis. New York: Twentieth Century Fund, 1955 (494 pp.).

A chapter on "Resouces and Their Productivity in Underdeveloped Areas," is included.

3.007. British and American Exports. G. D. A. MacDougall. Economic Journal, December 1951, Vol. 61 (pp. 697-724), and September 1952, Vol. 62 (pp. 487-521).

Effects of productivity, wage rates, and tariff levels on competitive power.

3.008. British and American Manufacturing Productivity: A Comparison and Interpretation. Marvin Frankel. University of Illinois Bulletin, January 1957 (130 pp.).

A comparison of basic postwar productivity data for 34 manufacturing industries. The statistical relationships between productivity differences and other variables, and an interpretation of the findings.

3.009. British and American Productivity. G. M. Clark, Jr. and S. R. Clark. Journal of the Institute of Personnel Management, September-October 1951 (pp. 230-238).

Factors leading to higher productivity in the United States as compared with Britain, based on reports by the Anglo-American productivity teams. Several theories are advanced and discussed.

3.010. British Efforts to Increase Productivity. Jean A. Flexner. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, December 1950 (pp. 704-706).

Various means employed by the British to measure and increase productivity in Great Britain. The activities of the Anglo-American Productivity Council, the British Institute of Management, and the Trades Union Congress.

3.011. British vs. American Productivity. Gertrude Deutsch. National Industrial Conference Board, Conference Board Business Record, November 1947, Vol. 4 (pp. 317-321).

Productivity comparisons for the following industries: cotton, boots and shoes, apparel, furniture, wool, and coal mining.

3.012. Can Europe Use American Methods? Andre Siegfried. Foreign Affairs, July 1952, Vol. 30 (pp. 660-668).

A Frenchman analyzes the factors influencing industrial production in the United States and evaluates them in terms of their applicability in Europe.

3.013. Coal Mining Since Nationalization: Great Britain. Jean A. Flexner. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1950 (pp. 19-25).

The recovery of prewar productivity in British mines, and the part national ownership contributed through closer negotiations with trade unions.

3.014. Comparative Economic Development: Canada and the United States. John H. Young. American Economic Review, May 1955, Vol. 45 (pp. 80-93).

Economic comparisons to throw light on the question: What determines the productivity of an economy?

3.015. Comparative Productivity in British and American Industry. Laszlo Rostas. University Press, Cambridge, England. New York: Macmillan Co., Occasional Paper No. 12 at the National Institute of Economic and Social Research, 1948 (263 pp.).

An analysis of the large discrepancies between productivity in manufacturing and nonmanufacturing industries in the two countries with emphasis on the need for action to increase output per man-hour in British factories, and on the need for further investigation of internation comparisons of productivity.

3.016. The Conditions of Economic Progress. Colin Clark. London: Macmillan & Co., 1940 (504 pp.).

Data for the principal countries of the world developing various per capita output measures.

3.017. The Conditions of Economic Progress. Colin Clark. London: Macmillan & Co., 1951 (584 pp.).

Expanded version of the book by the same author published in 1940.

3.018. Cotton Textile Wages in the United States and Great Britain, a Comparison of Trends, 1860-1945. Roland Gibson. London: Kings Crown Press. Labor Productivity, 1948 (pp. 13-27).

A presentation of measures of (1) value of gross output per man-hour and (2) value added by manufacture related to man-hours, and a discussion of new inventions and organization of the work force.

3.019. Crisis of Soviet Capitalism. Gilbert Burck and Sanford S. Parker. Fortune, February 1957 (pp. 102-107 ff.).

Includes a table on Russian productivity as percentage of United States productivity.

3.020. Differential Rates of Productivity Growth and International Imbalance. J. M. Letiche. The Quarterly Journal of Economics, August 1955, Vol. 69 (pp. 371-401).

The relationship between productivity growth and international imbalance.

3.021. Distribution of Gains from Rising Technical Efficiency in Progressing Economics. Mordecai Ezekiel. Address before the American Economic Association, December 29, 1956.

Productivity changes in highly industrialized countries as illustrated by the United States for agriculture and manufacturing industries.

3.022. Does Productivity Rise Faster in the United States? G. D. A. MacDougall. Review of Economics and Statistics, May 1956 (pp. 155-176).

A discussion of proportionate rates of productivity growth in the United States and the rest of the world, with trend tables for selected countries on specified economic factors.

3.023. Economic Development and Productivity Analysis: The Case of Soviet Metalworking. David Granick. Quarterly Journal of Economics, May 1957, Vol. LXXI (pp. 205-233).

Explores the thesis that industrial development in an underdeveloped country can be undertaken with the most modern techniques and the intermediate steps of development can be eliminated.

3.024. Economic Development of Underdeveloped Countries. New York: United Nations Organization. Working paper by Secretary General, United Nations Economic and Social Council, May 1954 (50 pp.). Also Report of May 18, 1953; and in Current History, November 1953 (pp. 312-317).

Efforts toward raising productivity in industry.

3.025. Europe's Competitive Challenge to American Productivity. Frederic S. Blackall, Jr. Time Study and Methods Conference of the Society for Advancement of Management and the American Society of Mechanical Engineers, New York, April 28, 1955. Mechanical Engineering, October 1955 (pp. 872-874).

United States manufacturing cost as related to that of European countries, the necessity of maintaining adequate tariff laws, and the lack of a guarantee that we maintain our productivity superiority.

3.026. Europe Today and in 1960. Eighth Annual Report of the Organization for European Economic Cooperation. April 1957, Vol. I (120 pp.); Vol. II (152 pp.).

Contains figures on the growth of Gross National Product per man-hour in all member countries from 1950-55.

3.027. The 14 Tools of the Marshall Plan Productivity Program. U. S. Economic Cooperation Administration, (now International Cooperation Administrative), 1950 (20 pp.).

"Tools" (points of contact, types and sources of information utilized, etc.), for raising productivity in the Marshall Plan countries.

3.028. From Recovery Towards Economic Strength. European Productivity Agency, Organization for European Economic Cooperation, March 1955, Sixth Report, Vol. I (258 pp.); Vol. II (256 pp.).

Chapter on trends in output per man-hour in manufacturing and extractive industries from prewar to 1954 for the United States and 7 European countries.

3.029. Industrial Production, Productivity and Distribution in Britain, Germany and the U. S.- Laszlo Rostas. The Economic Journal, April 1943, Vol. 53 (pp. 39-54).

An attempt to measure the scope, structure, and the productivity of manufacturing industries of Britain, Germany and the United States.

3.030. Industrial Productivity Growth in Europe and in the U. S. A. Maddison. Economica, November 1954, Vol. 21 (pp. 308-319).

An estimate of the degree to which the disparity between America and Europe has been increasing in the past 15 years, and some tentative suggestions about the future.

3.031. Industrial Productivity in Great Britain and the United States. A. W. Flux. Quarterly Journal of Economics, November 1933, Vol. 48 (pp. 1-38).

Sources of data, methods of measurement, trends and comparisons.

3.032. International Comparisons of Productivity. Laszlo Rostas. International Labor Review, September 1948, Vol. 58, No. 3 (pp. 283-305).

Compares productivity and real income in United States and United Kingdom for pre-World War II years for selected industries.

3.033. International Differences in Productivity and in Plant Size. Marvin Frankel. Productivity Measurement Review, February 1957, No. 8 (pp. 11-21).

Comparison of productivity for 29 manufacturing industries by size of plant in United States and Great Britain.

3.034. International Statistics of Production and Per Capita Output of Coal. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1926 (pp. 125-130).

Data on production, employment, duration of shift, and output per man-shift for coal-producing districts in Germany, France, Great Britain, Belgium, The Netherlands, Czechoslovakia and Poland, and the United States, 1913-1925.

3.035. Labor and the Productivity Issue in Western Europe. Labor and Nation, Summer 1951, Vol. 7, No. 3 (pp. 9-25). (No longer published).

Seven articles dealing with the purposes and problems of Economic Cooperation Administration Productivity Drive in Europe: Marion H. Hedges, Economic Cooperation Administration; Sol. D. Ozer, Economic Cooperation Administration; Maurice Bouladoux, Executive Officer of Christian Workers' Union, France; Nelson Cruikshank, Economic Cooperation Administration; John M. Carmody, Economic Cooperation Administration; William Gomberg, International Ladies Garment Workers' Union; and Andre Coret, President of the Young Employers' Trade Association of France.

3.036. Labor Costs in the Coal Industry in Various Countries. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1938 (pp. 1386-1390).

Comparison of United States output of coal per man-shift, 1935, with that of 7 European countries. Indexes for United States, 1927-36.

3.037. Labor Costs in the United States Compared with Costs Elsewhere. F. W. Taussig. The Quarterly Journal of Economics, November 1924 (pp. 96-114).

Comparison of quantity of labor per unit of output for selected manufacturing industries between United States and various other countries.

3.038. Labor Productivity and the Soviet Challenge. Irving H. Siegel. Mill and Factory, March 1952, Vol. 50 (pp. 79-83).

The effectiveness of the Soviet drive to increase output per man-hour, with United States comparisons.

3.039. Labor Productivity in Soviet and American Industry. Walter Galenson. New York: Columbia University Press, 1955 (273 pp.).

Development of labor productivity in a number of Soviet industries since 1928, productivity compared with their United States counterparts, and some general conclusions on comparative labor productivity.

3.040. Labor Productivity in the Soviet Union. Irving H. Siegel. Journal of American Statistical Association, March 1953, Vol. 48, No. 261 (pp. 65-78).

The impact of the incentive-pay plan, socialist competition and other features of Soviet life on labor productivity in comparison with labor productivity of advanced capitalist countries.

3.041. Labor Productivity of the Cotton Textile Industry in Five Latin-American Countries. New York: United Nations Organization, Department of Economic Affairs, 1951 (293 pp.).

The cotton spinning and weaving industries of Brazil, Chile, Ecuador, Mexico, and Peru are studied to assess industrial productivity, to compare it with standards based on the experience of highly industrialized countries, and to analyze the factors which bear upon it.

3.042. The Logic of British and American Industry. P. Sargant Florence. London: Rutledge and Kegan Paul, Ltd., 1953 (368 pp.).

An analysis of economic structure and government in the two countries, including a chapter on the meaning, mechanism and measures of efficiency in industry.

3.043. More Productivity for Europe. Modern Industry (now Dun's Review and Modern Industry), November 1951 (pp. 58-59).

The Mutual Security Agency Productivity Assistance Drive in Europe, purposes and how it operates.

3.044. New Productivity for the West. T. H. White. Management Review, December 1951, Vol. 40 (pp. 756-758).

The principal hindrances to rapid progress in raising Europe's productivity.

3.045. Number of Shops and Productivity in Retail Distribution in Great Britain, the United States and Canada. Margaret Hall and John Knapp. The Economic Journal, March 1955 (pp. 72-88).

Comparison of the structure and productivity of the British distributive trades with those in North America.

3.046. Organization and Technology in Soviet Metalworking: Some Conditioning Factors. David Granick. American Economic Review, Papers and Proceedings of the Sixty-ninth Annual Meeting, May 1957, Vol. XLVII, (pp. 631-642).

Improvements in productivity in the Soviet metalworking industry by use of up-to-date procedures.

3.047. Output of Coal Miners in Great Britain and Various Other Countries. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1922 (pp. 612-613).

Average output per man-year in the principal coal producing countries of the world, 1885-1921.

3.048. Output per Man-Hour in French Industry, 1938-47. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1948 (pp. 44-45).

Indexes of output per man-hour, industrial production, and employment.

3.049. Partners in Productivity; Shoe Factory, France. O. K. Armstrong. Readers Digest, July 1954 (pp. 145-148).

A French shoe manufacturer demonstrates unique methods of creating better employee-employer relations and thereby doubling productivity.

3.050. Plant Level Productivity in French and American Shoe Manufacturing. Kenneth G. Van Auken, Jr. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1953 (pp. 1-3).

Output per man-hour by price of shoe groups, and by departments within a shoe factory.

3.051. Postwar Growth in Soviet Labor Productivity. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1956 (pp. 556-557).

Review of the directives of the Soviet Union on the Sixth Five Year Plan, 1956-60, published in Pravda, January 15 and March 21, 1956.

3.052. Practical Methods of Increasing Productivity in Manufacturing Industries. International Labour Review, April 1953 (pp. 318-339).

The conclusions reached by a meeting of experts on Productivity in Manufacturing Industries held under the auspices of ILO in Geneva 1952.

3.053. Prices, Wages and Industrial Productivity in Australia and New Zealand. E. Lerdau and J. Rowe. Quarterly Journal of Economics, February 1954, Vol. 67 (pp. 156-165).

Compares the unit prices of products in Australia and New Zealand for 17 industries. Evaluates the assumption that a country will export a product to another country when the ratio of output per worker to money wage rate is greater than in that other country.

3.054. Production Functions and British Coal Mining. C. E. V. Leser. Econometrica, October 1955 (pp. 442-446).

Estimating the elasticities of output with regard to labor and mechanization in British coal mining, 1943-53.

3.055. Productivity and Economic Development in Latin America. Jorge Franco. International Labour Review, November 1955 (pp. 367-384).

Analyzes productivity problems of special importance to Latin America and suggests means of raising productivity in order to speed up the economic development of the region.

3.056. Productivity and the Worker -- Productivity in Coal Mining Discussed by ILO Committee. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Report, Developments of Labor Productivity, March 1954, No. 15 (pp. 13-16). Prepared in cooperation with the Foreign Operations Administration (now International Cooperation Administration).

A study of productivity problems in various countries, taken from Produktivity in Coal Mines, Coal Mine Committee ILO, Duseldorf, Germany; United Mine Workers Journal, January 1, 1954, page 11.

3.057. Productivity Comparisons Between some American and English Shoe Factories. A. D. Murray. Bulletin of the British Boot, Shoe and Allied Trades' Research Association. August 1951 (pp. 241-243).

Data for United States based on a survey of four American shoe factories.

3.058. Productivity, Employment and Living Standards. Ewan Clague. Statement before the Conference on Productivity, University of Wisconsin Industrial Relations Center, June 4, 1949. U. S. Department of Labor, Bureau of Labor Statistics, 1949 (8 pp.).

Comparisons of living standards in United States with those in other countries and forecast of technological advancement in United States.

3.059. Productivity in an Expanding Economy. A. Maddison. Economic Journal, September 1952, Vol. 62 (pp. 584-594),

The contribution of productivity increases to the remarkably rapid rate of growth of the Canadian economy over the past two decades.

3.060. Productivity in Canada, the United Kingdom and the United States. A. Maddison. Oxford University, Economic Papers (new series). London: Basil Blackwell & Motts, Ltd., October 1952, Vol. 4 (pp. 235-242).

Comparisons of levels of productivity in certain industries.

3.061. Productivity in Canadian Manufacturing. A. Maddison. Canadian Journal of Economic and Political Science, May 1953, Vol. 19 (pp. 222-226).

Comparison for selected industries in Canada and the United States, 1935-48.

3.062. Productivity in Manufacturing in the Postwar Period in Canada, Western Europe, and the United States. Francis W. Dresch. Stanford: Stanford University Research Institute, September 1953 (26 pp.).

A comparison of productivity in 11 Western European countries, Canada, and the United States, 1947-50.

3.063. Productivity in Puerto Rico. Simon Rottenberg. Paper for meeting of American Statistical Association, Boston, Mass., December 27, 1951 (18 pp.).

Puerto Rico's need for increased productivity to attract capital. Compares productivity levels in Puerto Rico and the United States in sugar refining, cement, fertilizer, and hydroelectric plants.

3.064. Productivity in Retail Distribution. Margaret Hall and John Knapp. The Economic Journal, 1955 (pp. 72-88).

Productivity in retail distribution in Great Britain, the United States, and Canada for selected shops.

3.065. Productivity in the Belgian Coal Mining Industry. Margaret Schoenfield. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1937 (p. 589).

Data for two Belgian coal fields for the period 1831 to 1934. Comparison of output per man-day in United States and Belgium.

3.066. Productivity in the Planned Economics of Eastern Europe. H. Kowalska. International Labour Review, August 1956 (pp. 146-173).

A general survey of Eastern Europe's approach to the problem of raising productivity.

3.067. Productivity in Underdeveloped Countries. S. Tilles. International Labour Review, December 1955 (pp. 496-513).

The necessity of an organizational framework to facilitate the introduction of technical knowledge for the increase of productivity.

3.068. The Productivity of Labor in Great Britain. Witt Bowden. The Journal of Political Economy, June 1937 (p. 347).

Comparisons of production, employment and average output per employee for selected industries, Great Britain and Ireland.

449922 O - 58 - 6

3.069. Productivity of Labour in British, American, and German Agriculture. Laszlo Rostas. London and Cambridge Economic Service (now incorporated in Times Review of Industry), July 1946, Vol. 24, Bull. 3 (pp. 78-81).

Compares output per worker, 1937-38 based on the net output of agriculture, adjusted by an exchange rate which expresses the relative prices of agricultural products in the three countries.

3.070. Productivity of Labour in the Cotton Industry. Laszlo Rostas. The Economic Journal, June-September 1945, Vol. 35 (pp. 192-205).

Comparison of long-term changes in output per man-hour in the United States and United Kingdom and factors accounting for the higher productivity level in the United States.

3.071. Productivity Measurement: Plant Level Measurement, Methods and Results. Prepared by Jean Carrie. Paris: European Productivity Agency, January 1956, Project 235, Vol. II (194 pp.).

An account of what has been done in the field of productivity measurement in various European countries, based on data collected directly in the firm; i.e., direct measurement. The first part is concerned with methodology, while the second compares the results obtained.

3.072. Productivity Survey of English and French Manufacturing Plants. James H. Silberman. U. S. Department of Labor, Bureau of Labor Statistics, May 29-July 10, 1948, and Recommendations for Further Action, August 2, 1948 (3 pp.).

Compares techniques in English and French plants, with those of comparable establishments in the United States.

3.073. Raising Productivity in Israel. Hy Fish. International Labour Review, October-November 1953, Vol. 68 (pp. 375-392).

Experiences in Israel in a compaign to raise productivity and suggestions that may be useful to other countries in the early stages of industrial development.

3.074. Report of the Cotton Textile Mission to the U.S.A. British Ministry of Production, March-April 1944 (78 pp.). o.p.

A comparison of productivity of labor and production methods in spinning and weaving mills in the United States and Britain and recommendations for improvements.

3.075. Some Observations on Soviet Industrial Growth. G. Warren Nutter. American Economic Review, Papers and Proceedings of the Sixty-ninth Annual Meeting, May 1957, Vol. XLVII (pp. 618-630).

Comparison of output and per capita, output for 37 industries, 1913, 1937, 1955 between the Soviet Union and the United States.

3.076. Soviet Economic Growth--Conditions and Perspectives. Edited by Abram Bergson. New York: Row Peterson and Co., 1953 (376 pp.).

Proceedings of a conference sponsored by the American Council of Learned Societies and the Social Society Council. Four papers--Transportation, James H. Blackman; Industrial Resources, Chauncey D. Harris; Industrial Labor Productivity, Walter Galenson; and Industrial Production, Donald R. Hodgman--deal with industrial development.

3.077. Soviet Industrial Production, 1928-1951. Donald R. Hodgman. Cambridge: Harvard University, Russian Research Center, 1954 (241 pp.).

Soviet industrial growth with international comparisons.

3.078. Soviet Labor and the Question of Productivity. Jerzy G. Gliksman. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1957 (pp. 702-706).

Analysis of recent changes in Soviet labor policy with the improvement of productivity as an important objective.

3.079. Soviet Labor Productivity. Irving H. Siegel. Baltimore: Johns Hopkins University, Operations Research Office, May 1952, Technical Memorandum ORO-T-125 (146 pp., including tables and appendices).

A report prepared under contract with the Department of the Army and originally restricted. In addition to introduction and summary, text contains 4 chapters--on productivity in Soviet thought and practice, measurement methods, trends, and international comparisons.

3.080. Survey of the Economy. Hugh Massingham. The New Republic, June 11, 1956 (pp. 18-20).

Compares Russian and American productivity from 1937 projected to 1965 along with other economic changes.

3.081. Technological Improvements in the Iron and Steel Industry and Their Effects on Employment. International Labour Office, Iron and Steel Committee, Geneva 1949, Report III, 3d Session (169 pp.).

Modernization and development plans in the principal iron and steel producing countries, some of the more important technological changes recently introduced and their effects on employment.

3.082. Textile Wages, An International Study. Studies and Reports. Geneva: International Labour Organization, 1952, New Series No. 31 (126 pp.).

Disparities in textile wages and the effect on the standards of living of textile workers in various countries.

3.083. Time and Labor Cost of Production in the Woolen and Worsted Industry; U. S., England, France, Germany. Charles E. Baldwin. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, September 1928 (pp. 431-456).

A comparison of output per man-hour in similar establishments of the United States and foreign countries. Data were obtained from officials of establishments producing each of 27 kinds of cloth.

3.084. Towards Higher Labour Productivity in the Countries of Western Europe. Jean Fourastie. International Labour Review, April 1953 (pp. 340-355).

Establishment and operation of the various productivity centers for the purpose of stimulating and developing efforts towards higher productivity.

3.085. Wages and Productivity in Glass Tableware Industry of Czechoslovakia and United States. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1933 (pp. 1059-1061).

A comparison of output per man-hour for similar articles of hand blown glass tableware in the United States and Czechoslovakia, 1929-30.

3.086. Wartime Productivity in Mining Industries. C. S. Gody. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1943 (pp. 255-257).

Indexes of production and output per man-hour, 1939-42. Compares the experiences of mining industries in various countries during World War I and II.

3.087. We Too Can Prosper: The Promise of Productivity. David Graham Hutton. London: George Allen and Urwin, Ltd., 1953 (248 pp.).

The experiences and findings of 66 productivity teams that had visited the United States under the program of the British Productivity Council.

3.088. World's Output of Work. T. T. Read. American Economic Review, March 1945, Vol. 35 (pp. 143-145).

International comparisons for 1929 and 1939 of work done by human and mechanical power.

SECTION IV

CONCEPT AND MEASUREMENT

4.001. Accounting for Productivity Changes--Men, Machines, or Management. Harry Ernst. Harvard Business Review, May-June 1956 (pp. 109-121).

A system of productivity accounting, designed to enable management of a plant to measure how much labor is contributing to the changes in overall productivity compared with other factors.

4.002. The Application of Investment Criteria. Hollis B. Chenery. Quarterly Journal of Economics, February 1953, Vol. 67 (pp. 76-96).

Theory and practice in the analysis of investment in underdeveloped areas. The application of social marginal productivity to a number of empirical situations.

4.003. An Application of Productivity Measurement. Lawrence W. Nelson. National Association of Cost Accountants Bulletin, February 1956, Vol. 37 (pp. 762-766).

An example of productivity measurement used to compute equivalent production and consumption.

4.004. An Appraisal of Current Productivity Developments. Leon Greenberg. Paper presented at the Work Study Conference, Chicago: Illinois Institute of Technology, March 4, 1954.

The complexities in measuring productivity trends with their international and economic significance.

4.005. Appraisal of Productivity Measures at Washington Conference. Harry J. Greenspan. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, March 1951 (pp. 313-316).

The Productivity Conference, War and Postwar Trends in Productivity, held in Washington, January 19, 1951, is summarized.

4.006. Aspects of Productivity Measurement and Meaning. Irving H. Siegel. Productivity Measurement: Concept. Paris: European Productivity Agency, August 1955, Project No. 235, Vol. I, Chapter III (pp. 43-59).

Productivity of labor presented as the most important index to be studied. Outlines the partial product method of determining productivity with heterogeneous products broken down into homogeneous subunits.

4.007. A Broader Conception of Productivity and Its Measurement. A. C. S. English. Journal of the Institute of Production Engineers, July 1951, Vol. 30 (pp. 356-379).

Methods of measuring productivity by individual firms.

4.008. Concepts and Measurements of Production and Productivity. Irving H. Siegel. Working Paper of the National Conference on Productivity, sponsored by the U. S. Department of Labor's Bureau of Labor Statistics, et al., Washington, 1952 (108 pp.).

The rationale and techniques of measurement of changes in the physical volume of production and the level of productivity. Includes an extensive bibliography on production and productivity measurement.

4.009. Cost Accounting and Productivity. Paris: European Productivity Agency, Organization for European Economic Cooperation, 1952 (125 pp.).

The use of cost accounting in the United States as studied by a group of European experts on the Technical Assistance Mission No. 50.

4.010. The Degree of Correspondence between the Concept of Marginal Physical Productivity and Its Empirical Referrents. Arnold Breeke. Journal of Farm Economics, May 1954 (pp. 316-323).

An evaluation of the degree of validity of this concept in connection with the nature of some empirical processes of productivity.

4.011. The Displacement of Workers Through Increases in Efficiency and their Absorption by Industry, 1920, 1931. David Weintraub. Journal of the American Statistical Association, December 1932, Vol. 27 (pp. 383-400).

A statistical method for measuring the influence exerted by increasing productivity upon the level of employment.

4.012. Economic and Financial Aspects of Productivity Measurement. Allen W. Rucker. Commercial and Financial Chronicle, July 28, 1955 (p. 6 ff.).

The meaning of productivity, its measurement, and its industrial future.

4.013. An Experiment in Productivity Measurement. William Langenberg. Bulletin of the National Association of Cost Accountants, January 1952 (10 pp.).

The application of productivity measurements based on the concept of the expenditure of various resources (input) in terms of manpower.

4.014. An Experiment Toward Measurement of Man-Hour Requirements for Selected Manufacturing Industries, 1939-49. U. S. Department of Labor, Bureau of Labor Statistics, January 1951 (16 pp.).

Relationship between production in physical units and labor input, and problems encountered in preparing productivity indexes.

4.015. A Formula for Measuring Productivity in Distribution. Wroe Alderson. The Journal of Marketing, April 1948 (pp. 442-448).

A device for measuring productivity in distribution.

4.016. Foundations of Productivity Analysis. Bela Gold. Pittsburgh: University of Pittsburgh Press, 1955 (291 pp.).

The major objectives are to strengthen the foundations of industrial productivity analysis, to facilitate the more rounded analysis of productivity adjustments by analytical models, to inquire into sources, nature, and effects of productivity adjustments, and to examine the role of managerial objectives.

4.017. Greater Productivity Means -- What? S. Moos. Economic Research Council, Economic Digest, July 1952, Vol. 5, (pp. 281-284).

Concepts of output per man-hour, and of labor productivity.

4.018. A Half Century of American Productivity Measurement. Irving H. Siegel. Paper presented at American Statistical Association, December 1950 (9 pp.).

A brief history of productivity measurement in the United States.

4.019. Hearings before the Joint Committee on the Economic Report. Washington: Congress of the United States Eighty-fourth Congress, January 24, 26, 27, 28, 31; February 1-3, 8-10, and 16, 1955.

Mr. Gerhard Colm of the National Planning Association presented a table showing output per man-hour based on gross private product in 1947 prices from 1939-54, with an analysis of productivity changes.

4.020. Incentive Compensation and Increased Productivity. New York: National Industrial Conference Board, Conference Board Management Record, June 1955, Vol. 17 (pp. 230-243).

Office Work Measurement by Norman H. Blumberg; Incentives for Office Workers by W. Gilbert Brooks; The Scanlon Plan by Edward M. Dowd; The Rucker Share of Production Plan by William C. Scodlat; Direct and Indirect Incentives by Phil Carroll. Papers presented at a panel discussion contain plans to reduce production costs and increase productivity by incentive forms of compensation.

4.021. Indexes of Labor Productivity as a Partial Measure of Technological Change. W. Duane Evans. U. S. Department of Labor, Bureau of Labor Statistics. Conference on Quantitative Description of Technological Change, April 1951 (29 pp.). Also in Input-Output Relations, Netherlands Economic Institute, H. E. Stenfert Kroese and N. V. Leiden, 1953 (pp. 33-35).

An analysis of the conceptual implications and limitations of these measures, their reflection of technological change, and the use of an interindustry relations tabulation.

4.022. Individual Productivity Differences. W. Duane Evans. U. S. Department of Labor, Bureau of Labor Statistics, 1940, Serial No. R. 1040 (22 pp.). Summary in Monthly Labor Review, February 1940 (pp. 338-341).

The implications for industry and society of the problem of the slow employee. Dispersion in distribution of worker productivity is examined and some data on relationship to age are included.

4.023. Industrial Efficiency. Bela Gold. Pittsburgh: University of Pittsburgh Press, 1955 (303 pp.).

Foundations of productivity analysis: guides to economic theory and marginal control.

4.024. Industrial Productivity and Prices. Frederick C. Mills. Journal of The American Statistical Association, June 1937, Vol. 32 (pp. 247-262).

Procedures that may be employed to measure changes in productivity and to trace the incidence of such changes on producers and consumers.

4.025. Investment Criteria, Productivity, and Economic Development. Walter Galenson and Harvey Leibenstein. Quarterly Journal of Economics, August 1955, Vol. 69 (pp. 343-370).

The criterion of allocating investment on the basis of the marginal productivity of each unit of capital investment is examined with respect to underdeveloped areas.

4.026. It's Not Always Productivity. Gertrude Deutsch. National Industrial Conference Board, Conference Board Business Record, March 1950, Vol. 7 (pp. 114-115).

A criticism of the methods of measuring productivity for the entire national economy used in the Annual Economic Review (January 1950) of the Council of Economic Advisers to the President.

4.027. Job Performance and Age: A Study in Measurement. Jerome A. Mark, Wolfram Liepe, and Bernard Rein. U. S. Department of Labor, Bureau of Labor Statistics, September 1956, Bull. No. 1203 (72 pp.). Summary in Monthly Labor Review, December 1956 (pp. 1-5).

Analysis of output per man-hour, and other factors encountered in measuring the relationship between age and work performance. Research was confined to 8 manufacturing establishments in 2 industries--footwear and men's clothing.

4.028. The Learning Curve as a Production Tool. Frank J. Andress. Harvard Business Review, January-February 1954 (pp. 87-97).

Methods and use of learning curves applied to productivity measurement. The aircraft industry is used as an example.

4.029. A Manual of Time and Motion Study. J. W. Hendry. 4th Ed. New York: Pitman Isaac, 1953 (221 pp.).

A guide to the measurement of human endeavor in industry and to the development of productive efficiency.

4.030. A Marginal Productivity Analysis -- A Defect and a Remedy. John S. Henderson. Econometrica, January 1953, Vol. 21, No. 1 (pp. 155-174).

An algebraic technique, of the theory of minima under multiple constraints, is applied to production theory.

4.031. Maximizing Worker Productivity through Evaluation of its Components: A Hypothesis. M. E. Brunk. Journal of Farm Economics, August 1951 (pp. 381-388).

Three viewpoints to be considered in measuring productivity: the industrial engineer, the psychologist, and the economist.

4.032. The Meaning and Measurement of National Productivity. John W. Kendrick. Washington: The Graduate Council of George Washington University, June 1955 (286 pp.).

Development of the theory that if productivity estimates are to indicate changes or differences in productive efficiency, the physical volumes of outputs must be related to the physical volumes of all corresponding economic inputs weighted by constant unit factor costs and unit factor prices, respectively.

4.033. The Meaning and Measurement of Productivity. Hiram S. Davis. Industrial Productivity, Industrial Relations Research Association, University of Wisconsin, 1951 (2 pp.). (Reproduced for the Belgium Study Group on Principles of Productivity. U. S. Mutual Security Agency, Project TA-32-72, May-June 1952).

Basic concepts of productivity and its measurement, prepared for use in connection with study programs arranged by the Department of Labor for labor-management teams and special study groups visiting the United States.

4.034. The Meaning and Measurement of Productivity in Distribution. Reavis Cox. The Journal of Marketing, April 1948, Vol. 12 (pp. 433-441).

Various approaches to the measurement of productivity in distribution.

4.035. The Meaning of Productivity Indexes. W. Duane Evans and Irving H. Siegel. Journal of the American Statistical Association, March 1942, Vol. 37 (pp. 103-111).

The nature, use, and limitations of productivity index numbers.

4.036. Measurement of Current Trends in Output per Man-Hour. Leon Greenberg, Jack Alterman and Allan D. Searle. (A paper presented to the American Statistical Association, New York, N. Y., December 1955). U. S. Department of Labor, Bureau of Labor Statistics (21 pp.). Also appears in the Productivity Review No. 5, May 1956 (pp. 5-33).

The problems of measuring current productivity trends, concepts and methodology, and comparisons of productivity measures.

4.037. The Measurement of Productive Efficiency. New York: Accounting Research Co., April 1951, Vol. 2 (pp. 151-160).

A preliminary survey of the accounting contribution to the measurement of productive efficiency.

4.038. The Measurement of Productivity. Washington: Council for Technological Advancement, August 3, 1953 (16 pp.).

Definition, statistical studies and factors responsible for changes in productivity.

4.039. The Measurement of Productivity in State Undertakings and Public Services. Gabriel Ardant. International Labor Organization, International Labour Review, May 1953, Vol. 67 (pp. 434-452).

Outlines of methods used--evaluation of the cost, the output of the public services--and some practical conclusions drawn from increasing productivity.

4.040. Measurement of Productivity -- Methods used by the Bureau of Labor Statistics in the U. S. A., Paris: European Productivity Agency, Organization for European Economic Cooperation, October 1952 (104 pp.).

Concepts and definitions, organization and procedures in the field of productivity.

4.041. The Measurement of the Technological Factor in Labor Productivity. Arthur Wubnig. Journal of the American Statistical Association, June 1939, Vol. 34 (pp. 319-325).

A study emphasizing that pressure of technological changes on employment is not necessarily measured by productivity since productivity measures are influenced by many short-term factors.

4.042. Measurement of Unit Man-Hour Requirements. George E. Sadler and Allan D. Searle. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1950 (pp. 169-177).

The methods and procedures used by the Bureau of Labor Statistics for deriving productivity indexes are summarized.

4.043. Measuring Labor's Productivity. New York: National Industrial Conference Board, Studies in Business Policy, No. 15, 1946 (20 pp.).

A summary of addresses delivered at a round table conference: Solomon Fabricant of the National Bureau of Economic Research discussed the relationship between employment and production; Allen W. Rucker, President of the Eddy-Rucker-Nichols Company,

was concerned with a method of measuring productivity as a means of determining commercial efficiency; W. Duane Evans of the U. S. Bureau of Labor Statistics made some observations on the significance of the Bureau's productivity studies and general prewar and postwar trends; Andrew T. Court, Labor Economics Section of General Motors Corporation, emphasized postwar findings in a few plants and the need for increased productivity.

4.044. Measuring the Economic Productivity of Land. W. H. Pine. Journal of Farm Economics, November 1948 (pp. 777-783).

A measurement of agricultural productivity by the monetary (net income) method.

4.045. Measuring the Productivity of Capital. Joel Dean. Harvard Business Review, January-February 1954, Vol. 32, No. 1 (pp. 120-130).

The degree to which decisions on investments are controlled by profit goals.

4.046. Methods of Labour Productivity Statistics. Geneva: International Labour Office, Report prepared for the 7th International Conference of Labor Statisticians, Geneva, September 1949. Studies and Reports 1951, New Series No. 18 (136 pp.).

Reviews the methods of measuring and comparing productivity, principally in the United States. Objectives, concepts, definitions, and factors influencing productivity. Problems concerning the comparability of production and man-hour data and possible formulae.

4.047. Next Task in the Measurement of Production and Productivity. Irving H. Siegel. Estadistica, September/December 1955 (pp. 388-398).

Problems of theory, practice, and meaning of "physical" production and productivity measurement over time.

4.048. Notes on the Productivity Conference. Thomas J. Mill. American Economic Review, March 1947, Vol. 37 (pp. 187-190).

Summarization of the topics discussed in the five sessions of the Conference on Productivity held in Washington, October 28 and 29, 1946. Input-output ratios, productivity at the plant and national levels.

4.049. Objective Procedures for Estimating Industrial Productivity. Adam Abruzzi. New York: Cornell University. Industrial and Labor Relations Review, October 1951 (pp. 108-117).

An evaluation of various applications of the methods.

4.050. On Capital Productivity, Input Allocation and Growth. Otto Eckstein. The Quarterly Journal of Economics, February 1957 (pp. 86-106).

Studies of the desirability of capital-intensive processes in countries where capital is scarce relative to labor, and on input allocation as a maximizing problem.

4.051. On the Measurement of the Productivity of Labor. Sigmund P. Zobel. Journal of the American Statistical Association, June 1950 (pp. 218-224).

Several formulas for constructing productivity indexes which make allowance for changes in the composition of the labor force, and changes in the time or effort expended by the workers.

4.052. Procedure for Measuring Employee Productivity. Martin Kriesberg. Advanced Management, August 1952 (pp. 6-8).

Procedure for measuring the productivity of delivery truck drivers, offering a measure of productivity from operations that cannot be standardized and for which a count of units produced is not feasible.

4.053. Production Management, Productivity, Costs, Wages, Labor Relations. Albert Ramond. New York: Albert Ramond and Associates, Inc., 1948 (45 pp.).

A system for measuring productivity by use of a work unit standard. Charts show the results of the use of various incentive systems on productivity.

4.054. Productivity. Peter O. Steiner and William Goldner. University of California, Institute of Industrial Relations, 1952 (60 pp.).

The concept of productivity, its measurement and interpretation; productivity and industrial relations.

4.055. Productivity: A Critique of Current Usage. Lewis A. Maverick. Southern Illinois University, Department of Economics, 1955 (30 pp.).

A critical review of the present use of the productivity concept, with suggested formulas that might be used in productivity measurement.

4.056. Productivity Accounting. Hiram S. Davis. Wharton School of Finance and Commerce, Industrial Research Department, Philadelphia: University of Pennsylvania Press, 1955, Research Study No. 37 (194 pp.).

A method of measuring total productivity in a business enterprise by means of accounting techniques. An actual plant case study exemplifies methods of comparing, over a time period, total plant outputs with total plant inputs.

4.057. Productivity Accounting. Hiram S. Davis. (Digested by Mary Jordan.) A Book Digest by Controllership Foundation, Inc., 1957 (51 pp.).

A method for measuring the productivity of a business--the ratio of total goods and services produced by an enterprise to the total economic costs incurred, both products and costs revalued to some selected scale of constant prices.

4.058. Productivity An Important Function of Management. John W. Roberts. An address before the Metals Manufacturing Industry Conference, Boston, Massachusetts. New York: Albert Ramond and Associates, Inc., September 28, 1953 (23 pp.).

The meaning, concept, and value of productivity measures, with conclusions on how, and to whom, the benefits of productivity should be distributed.

4.059. Productivity Change. Sam Arnold. Ohio State University, Bulletin of Business Research, November 1952, Vol. 27 (p. 1).

Definitions of productivity and reasons for productivity changes.

4.060. Productivity in the Short Term. Robert H. Persons, Jr. The Conference Board Business Record, March 1957 (pp. 110-116).

Meaning and measurement of productivity 1947-56 and the significance of current changes.

4.061. Productivity in War and Peace. Julius Hirsch. American Economic Review, May 1947 (pp. 397-411).

The distinction between volume productivity, and real productivity.

4.062. The Purpose and Method of Measuring Productivity. Harry Magdoff. Journal of the American Statistical Association, June 1939, Vol. 34 (pp. 309-318).

Productivity indexes are developed to yield the relative volumes of labor time required to produce a specified composite of products at different times. Effect of different weighting schemes discussed.

4.063. Productivity Measurement. Solomon Fabricant. New York University Press, Conference on Labor, Proceedings, 1950 (pp. 75-92).

Problems involved in the measurement of productivity. Concepts, existing measures, and inadequacies of basic information are reviewed.

4.064. Productivity Measurement -- A Tool for Evaluating Production Efficiency. U. S. Department of Labor, Bureau of Labor Statistics, 1947 (11 pp.).

Explains productivity by use of graphic presentation.

4.065. Productivity Measurement and Control. Ewan Clague. Chemical Engineering Progress, April 1954 (pp. 167-172).

Productivity measurement from a plant, company, and national point of view.

4.066. Productivity Measurement: Concepts. Prepared by G. Deuringck. Paris: European Productivity Agency, August 1955, Project No. 235, Vol. I (143 pp.).

The first of three volumes covering six studies. The introduction by Mr. Deuringck establishes a link between the contributions to give a clearer idea as to the differences and similarities among these studies. The following listed essays are included:
Chapter I. The Concept of Productivity and Its Corollaries -- Prof. Jean Fourastie and a Working Party of the National Council of Productivity (France).
Chapter II. Alternative Productivity Concepts -- Dr. Laszlo Rostas (U. K.).
Chapter III. Aspects of Productivity Measurement and Meaning -- Irving H. Siegel (U. S.).
Chapter IV. The Role of Official Statistics in Measuring Productivity -- Dr. Gerhard Furst (Germany).
Chapter V. Productivity, Efficiency and Wages -- Dr. Erik Ruist (Sweden).
Chapter VI. Indices of Industrial Efficiency -- B. Walstedt (Sweden).
The appendix contains views and conclusions drawn by other authorities in the field of productivity measurement.

4.067. The Productivity Measurement Program of the Bureau of Labor Statistics. Benjamin D. Kaplan. U. S. Department of Labor, Bureau of Labor Statistics, August 1950 (80 pp.). Supplement, July 1952 (66 pp.).

Productivity concepts and definitions, types of published indexes, sources of data, methods of calculation, organization, and procedures of the Bureau of Labor Statistics. Sample questionnaires and worksheets.

4.068. Productivity Measurement Review. Paris: European Productivity Agency, Quarterly issues, (February, May, August, November) No. 1 issue, May 1955.

The problems involved in the definition, measurement and increase in productivity. Include articles on productivity in various countries and for specific industries.

4.069. Productivity Measurement Review. Paris: European Productivity Agency, 1st Special Number, June 1956 (56 pp.).

A survey made by the British Institute of Management of the use British industry has made of the reports, "Case Study Data on Productivity and Factory Performance," prepared by the U. S. Department of Labor, Bureau of Labor Statistics.

4.070. Productivity Measurement Review. Paris: European Productivity Agency, 2nd Special Number, April 1957 (50 pp.).

Report of a survey made in France by the Centre d'Etudes et de Mesures de productivite on, "Case Study Data on Productivity and Factory Performance," prepared by the U. S. Department of Labor, Bureau of Labor Statistics.

4.071. Productivity Measurements Can be Obtained and Used. John H. Kempster. National Association of Cost Accountants, Bulletin, June 1954 (pp. 1276-1277).

How productivity measures may have some practical application to the problem of cost reporting.

4.072. The Productivity Ratio: Some Analytical Limitations on Its Use. Peter O. Steiner. Harvard University, The Review of Economics and Statistics, November 1950, Vol. XXXII, No. 4 (pp. 321-328).

The concepts of productivity statistics in their relation to the setting of wage rates.

4.073. Productivity Studies: Planning Guides for Industry. Ewan Clague. Dun's Review (now Dun's Review and Modern Industry), October 1948 (pp. 20-22).

Describes the Bureau of Labor Statistics industry studies based on direct industry reports and indicates how some of the findings from these reports may be useful as planning guides for industry.

449922 O - 58 - 7

4.074. Productivity -- The Hot News Issue. Business Week, March 9, 1957 (pp. 25-26).

Different interpretations on what productivity means and how to measure it.

4.075. Progress and Problems of Physical Output Measurement. Irving H. Siegel. Paper presented at the December 1950 annual meeting of the American Statistical Association.

Problems of theory, practice and meaning of productivity measurement.

4.076. Progress and Status of Productivity Measurement in the United States. Samuel I. Weiss. U. S. Department of Labor, Bureau of Labor Statistics, paper presented at the 28th Session, International Statistical Institute, Rome, Italy, September 6-12, 1953 (10 pp.).

The historical development of productivity measurement in the United States and the contribution of the Bureau of Labor Statistics.

4.077. Relationships Between Productivity Measures. Allan D. Searle. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, May 1954 (pp. 552-557).

The concepts and formulation of the physical output and net output indexes from a technical viewpoint.

4.078. Russian Labor Productivity Statistics. Walter Galenson. Cornell University, Industrial and Labor Relations Review, July 1951, Vol. IV, No. 4 (pp. 497-508).

Concepts employed by Russian statisticians in computing labor productivity.

4.079. Selected Statements Interpreting the Productivity Measurement Program of the Bureau of Labor Statistics. George E. Sadler. U. S. Department of Labor, Bureau of Labor Statistics, August 1950 (80 pp.).

Three lectures by Ewan Clague: "Productivity, Employment, and Living Standards"; "Cost Reduction: A Postwar Problem"; "Recent Productivity Trends and Their Implications." A paper by George E. Sadler and Walter Hirsch: "Uses of Productivity Data in American Establishments." An Operations Report, Institute of American Research. Chart illustrations of the first four papers.

4.080. Some Concepts and Limitations of Productivity Measures. Leon Greenberg. Iowa State College, Iowa Business Digest, Fall Number, November 1955 (pp. 15-22).

Some basic problems in measuring productivity, describing the nature of different types of measures and showing how such measures yield the same or different results.

4.081. Statistical Problems Confronted in the Analysis of the Relationship Between Production, Productivity, and Employment. David Weintraub. Washington: United States Works Progress Administration, National Research Project, 1937 (20 pp.). o.p.

Problems in estimating labor displacement from productivity indexes. NRP charts for 1920-27 on production, employment, and productivity.

4.082. Summary of Proceedings of Conference on Productivity, October 28-29, 1946, U. S. Department of Labor, Bureau of Labor Statistics, Bull. No. 913 (52 pp.).

The principal topics and speakers were: Economic Setting, Robert Nathan; Problem of Concepts and Measurements, Hiram Davis; At the Job Level, Martin Gainsbrugh and Nathan Spero; At the Plant and Company Level, Benjamin Haskel, H. B. Maynard and Charles E. Young; At the Industry Level, Solomon Barkin, Charles E. Young, and John D. Gill; At the National Level, M. Hedges, Everett Hagen, and Robert W. Burgess; At the International Level, Julius Hirsch, C. Merwin, and H. Staehle; Scope and Limitations of Existing Measures, W. Duane Evans, Kathryn P. Ellickson, R. Schulman, and Andrew Court; Need for Additional Measures, Lazare Teper; Presentation of Productivity Measures, Solomon Fabricant.

4.083. This Thing Called Productivity. Lazare Teper. American Federationist, November 1948 (pp. 16-18).

Concepts and trends of productivity during World War II and the effects of productivity increases.

4.084. Trends in Output per Man-Hour and Man-Hours per Unit of Output -- Manufacturing, 1939-53. U. S. Department of Labor, Bureau of Labor Statistics, 1955, BLS Report No. 100 (33 pp.). Excerpts from Automation and Technological Change. Hearings before the Subcommittee on Economic Stabilization of the Joint Committee on the Economic Report, 1955 (pp. 301-334). (See reference in Section I. D-1.)

Presentation, methodology, and analysis of four series of indexes of change in the output per man-hour: physical output per man-hour, base year weighted; physical output per man-hour, current year weighted; net output per man-hour, base year prices; net output per man-hour, current year prices.

4.085. Trends in Productivity Since the War. Ewan Clague. Presented to the National Industrial Conference Board Meeting, New York, January 20, 1956 (11 pp.).

Trends in productivity from 1947-53 and 1953-55. Techniques for measuring productivity and some of the factors which influence it.

4.086. War and Postwar Trends in Productivity. U. S. Department of Labor, Bureau of Labor Statistics, Summary of Proceedings of Conference on Productivity, January 19, 1951.

Transcript of a forum for the discussion of productivity concepts and measurements among representatives from labor, industry, government, private research agencies, and academic institutions sponsored by the Bureau of Labor Statistics and the Division of Statistical Standards of the Bureau of the Budget.

4.087. What Does Productivity Measure? The Pulp and Paper Industry of the United States. Seymour Melman. A revision of the paper presented to a panel session of the National Conference on productivity in Washington, D. C., June 1954, and as published in the Paper Trade Journal, August 6, 1954. European Productivity Agency, Productivity Measurement Review, August 1956, No. 6 (pp. 5-17).

A discussion of some of the main determinants of productivity change. Contains a statistical analysis of alternative labor-machine costs.

4.088. Work Measurement. New Principles and Procedures. Adam Abruzzi. New York: Columbia University Press, 1952.

A scientific method of measuring productivity.

4.089. Yardsticks of Productivity and Use of Productivity Concept in Industry. Ewan Clague, Commissioner of Labor Statistics. Presented before the 46th annual meeting of the American Institute of Chemical Engineers, St. Louis, Missouri, December 14, 1953. U. S. Department of Labor, Bureau of Labor Statistics (16 pp.).

Productivity measurement from a plant and national level, and industry's uses of these measures.

SECTION V

FACTORS AFFECTING PRODUCTIVITY

(See also Sections I, II and IV).

5.001. American Genius for Productivity. Gilbert Burck. Fortune, July 1955, Vol. 52 (pp. 86-87ff).

Key factor responsible for America's rapid productivity growth; the practical, economic, ambitious young American as an individual.

5.002. American Productivity. C. R. Walker. Fortune, January 1946 (pp. 150 ff.) and February 1946 (pp. 131 ff.).

New machines, methods and materials developed during the war, for electric power, synthetic rubber, electronics, and air transportation, and their influence on productivity in other industries.

5.003. Analysis of Work Decrement Factors in a Repetitive Industrial Operation. Louis E. Davis and P. Dudley Josselyn. Advanced Management, April 1953 (pp. 5-9).

The result of research concerning constant effective operation time.

5.004. Are New Machines Cutting Down Jobs? U. S. News and World Report, February 18, 1955 (3 pp.).

Analyses of economic data for the years 1947-54, and changes in productivity during this period.

5.005. Balancing America's Productivity. R. Robert Updegraff. Dun's Review and Modern Industry, April 1955 (pp. 37-38 & 87-95).

How we can keep the "machine for-good-living" operating efficiently.

5.006. Color, A New Tool for Industry. Mill and Factory, October 1953 (pp. 117 ff.).

The results of a study carried out by United States Public Health Service demonstrates that better light and color choices resulted in increases in productivity.

5.007. The Controversy is Still Going Strong. Business Week, March 7, 1953 (pp. 112-114).

Seven companies in different industries report the results of their wage incentive systems.

5.008. Diet and Physical Efficiency. Dr. H. W. Haggard and Dr. L. A. Greenberg. New Haven: Yale University Press, 1935 (180 pp.).

Changes in the "pattern of productivity" resulting from dietary differences as observed on 213 industrial workers.

5.009. Do Training Programs Work? Business Week, July 21, 1956 (pp. 79-80).

Prof. Zalesnik of Harvard University tells why most present company-imposed productivity programs are ineffectual. List of colleges and industries that are doing research on this program.

5.010. Dynamic Factors in Industrial Productivity. Seymour Melman. New York: John Wiley and Sons, Inc., 1956 (238 pp.).

A test of three hypotheses affecting labor productivity: (1) Degree of mechanization. (2) Ratio of labor and machine cost. (3) Growth of administrative overhead.

5.011. Employee Productivity in Department Stores. Elizabeth A. Burnham. Harvard Business Review, July 1949 (pp. 480-497).

Factors influencing employee productivity, and the possibility of increasing productivity through minimizing lost sales.

5.012. Employee Understanding and Teamwork for Greater Productivity. John P. Troxell. New York: National Association of Manufacturers, 1954 (96 pp.).

Three key concepts: Understanding, teamwork, and productivity, discussed as the most important factors in economic advancement.

5.013. Employee's Attitudes and Output. Rensis Likert and Stanley E. Seashore. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, June 1954 (pp. 641-648). (Excerpts from "Manpower in the United States: Problems and Policies," published by Harper and Brothers.)

The possibilities for increasing productive effort and consequently productivity through better management in the utilization of human resources.

5.014. The Erratic Behavior of Steel Productivity. Business Week, October 13, 1956 (pp. 53-56).

Deciding factors on productivity's future course in the light of the Bureau of Labor Statistics' analytical study of the steel industry, "Man-Hours per Unit of Output in the Basic Steel Industry."

5.015. Factors Affecting Inter-Plant Differences in Productivity. Samuel Thompson. U. S. Department of Labor, Bureau of Labor Statistics, 1951 (13 pp.). (Reprinted from Industrial Productivity, 1951 (pp. 212-224), published by the Industrial Relations Research Association.)

Differences in man-hours per unit by industries and between plants producing the same or similar products, 1949-50.

5.016. Factors Affecting Productivity in the Metal Trades. Geneva: International Labour Office, 1952 (116 pp.).

The means and methodology by which productivity can be increased in the metal trades, and the principles that should be applied in the distribution of these gains.

5.017. Group Cohesiveness as a Factor in Industrial Morale and Productivity. Stanley E. Seashore. Social Psychology Program, Ann Arbor: University of Michigan, April 1954 (166 pp.).

The important contribution of group cohesiveness toward higher morale and increases in productivity is substantiated by testing industrial situations with established groups of varied sizes, through questionnaires.

5.018. Growth in Use of Power Equipment in the U. S., 1849-1923. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, July 1928 (pp. 36-38).

A United States Geological Survey study relates the development of power equipment in each of the major fields of industrial activity to the number of employees.

5.019. A Guide to Raising Productivity. New York: United Nations Organization, United Nations Bulletin, July 15, 1953, Vol. 14 (pp. 427-429).

The importance of cooperation on the part of government, employers, and workers, to attain higher productivity.

5.020. Higher Productivity in Manufacturing Industries. Geneva: International Labour Organization. Studies and Reports, 1954 (195 pp.).

General conditions affecting productivity within industries and within plants.

5.021. History of American Technology. John W. Oliver. New York: The Ronald Press, 1956 (676 pp.).

A review of the role of science and technology in the development of the United States, describing progress in agriculture, manufacturing, communications, and transportation.

5.022. Hours of Work and Output. Max Davis Kossoris and Reinfried F. Kobler, et al. U. S. Department of Labor, Bureau of Labor Statistics. Bull. No. 917, 1947 (160 pp.).

Deals primarily with case studies of working hours, output and other influencing factors in promoting industrial efficiency.

5.023. How Necessary is Automation to America. Ewan Clague, Commissioner of U. S. Department of Labor's Bureau of Labor Statistics. Presented at the University of Chicago, November 14, 1955 (15 pp.).

Factors which influence the introduction of new technology, with possible effects of automation on occupations and industries as well as more general effects on the economy as a whole.

5.024. How to Increase Productivity in Small Plants. F. K. Shallenberger. Mechanical Engineering, May 1952 (pp. 384-388).

The problems of increasing productivity in a small plant where weakness in nonmanufacturing functions--sales credit, finance, procurement personnel--are as likely to be the basic causes of low productivity as shortcomings in the production functions.

5.025. Human Factors in Management. New York: Harper and Brothers, 1951, Rev. Ed. (327 pp.).

Includes case studies on productivity and human relations.

5.026. Increased Output Becomes a Bone of Contention. Business Week, August 11, 1956 (pp. 129-131).

"The Three-Year Rise in Labor Productivity"--how much is due to increased worker effort and efficiency, and how much to management expenditures and planning in the form of new machinery and better methods.

5.027. Increased Productivity. Industrial Relations Session. New York: American Iron and Steel Institute, Yearbook, 1951 (pp. 75-108).

Four papers presented at the Industrial Relations Session, May 24, 1951: Increased Productivity Through Safety and Accident Prevention, Hjalman W. Johnson; Increased Productivity Through Incentives, R. Conrad Cooper; Increased Productivity Through Human Relations, Charles L. Houston, Jr.; Increased Productivity Through Training or Through Guiding the Employee, Joseph S. Kopas.

5.028. Increasing Labor Efficiency through Worker Training and Improved Labor Relations. Lawrence M. Vaughan. Journal of Farm Economics, November 1955 (pp. 827-836).

The problems that arise in all types of farm work and a discussion of those involved in training farm workers as compared with industry's worker problems.

5.029. Increasing Productivity and Technological Improvements in Defense Industries. L. A. Epstein and Irving H. Siegel. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, January 1942 (pp. 34-48).

Developments which were of benefit in the defense program.

5.030. Industrial Productivity. Seymour Melman. Scientific American, July 1955, Vol. 193 (pp. 33-35).

The ratio between labor and machinery costs as the factor which determines how much a worker can produce in different periods and in different countries.

5.031. Industrial Productivity. Ann Arbor: University of Michigan, Industrial Relations Research Association, December 1951, Publication No. 7 (224 pp.).

Twelve articles on special aspects of productivity. The final article discusses interplant differences in productivity using special tabulations of data of the U. S. Department of Labor's Bureau of Labor Statistics.

5.032. Industrial Productivity in Relation to the Cost of Management. Seymour Melman. Productivity Measurement Review, May 1956, No. 5 (pp. 5-20).

A test of the assumption that changes in management cost and industrial productivity are closely related.

5.033. Industrial Training in the Soviet Union. Walter Galenson. Industrial and Labor Relations Review, July 1956 (pp. 562-576).

Description of the Soviet training program aimed primarily toward increasing labor productivity.

5.034. Inflation or Deflation? Durns Says Both Must Be Avoided. Arthur F. Burns. The full text of an address by Mr. Burns, the President's Adviser, before the National Federation of Financial Analysts' Societies in Boston, on May 21, 1956. U. S. News and World Report, June 1, 1956 (pp. 126-129).

A forecast of continued economic growth in United States with a study of contributing factors--technology, managerial planning, research, and capital investment all helping to increase industrial productivity.

5.035. International Reduction of Working Hours and Labor Productivity Industry and Labor. Geneva: International Labour Office, February 1950 (pp. 119-121).

The technological progress made in modern science and industrial methods and the effects of these and other changes on productivity.

5.036. An Investigation of Rest Pauses, Working Conditions, and Industrial Efficiency. Western Electric Co., Progress Report, May 11, 1929 (146 pp.).

Research on control groups at the Hawthorne plant of the Western Electric Co.

5.037. Investment Criteria in Development. Alfred E. Kahn. Quarterly Journal of Economics, February 1951, Vol. 65 (pp. 38-61).

The "rule of marginal productivity" as a guide to investment. Underdeveloped areas should choose industries and techniques requiring a lower capital/labor ratio than that prevailing in developed countries.

5.038. Job Enlargement Boosts Production. John Kord Lagermann. Nation's Business, December 1954, Vol. 42 (pp. 34-37).

A systematic rating of ten morale factors, by supervisors and by employees, and their value toward increasing production and productivity in the plant.

5.039. Labor Productivity. L. B. Wheildon. Washington: Editorial Research Report, 1946, Vol. 11 (pp. 649-662).

Reviews the principal findings on productivity in the United States over the last century. Analyzes examples of labor-management cooperative efforts to increase productivity and comments on the results of the research.

5.040. Labor Productivity and Size of Establishment. J. Johnson. Oxford: Basil Blackwell and Mott, Ltd. Bull. of the Oxford University Institute of Statistics, November-December 1954, Vol. 16 (pp. 339-361).

An exploration of the statistical paradox of the conflicting results that emerge according to the classification methods adopted.

5.041. Levels of Expectation in Productivity. R. G. Stansfield. Occupational Psychology, January 1951, Vol. 25, No. 1 (pp. 25-34).

The expectation of persons immediately around is studied as one of the most powerful factors in increasing productivity in manufacturing.

5.042. Mechanization in Industry. Harry Jerome. New York: National Bureau of Economic Research, 1934 (484 pp.).

Factors determining the rapidity and the effects of mechanization in manufacturing, construction, agriculture, and mining. Mechanical changes and dates of introduction. Basic data from field studies, mailed surveys, and government sources.

5.043. Mechanization Versus Wages. Seymour Melman. Economic Digest, April 1953, Vol. 6 (pp. 169-171).

The substitution of machinery for labor as an economic proposition.

5.044. Morale and Productivity. Dick Carlson. A case study in management viewpoints, California Personnel Management Association. Management Report 1952, No. 150 (14 pp.).

Experience of the Farm Bureau Insurance Companies of Columbus, Ohio is presented.

5.045. Motivation and Increased Productivity. Rensis Likert. Management Record, April 1956 (pp. 128-131).

Findings emerging from research on management practices and industrial productivity.

5.046. Nine Incentive Plans in a Two Hundred Man Plant. F. R. Larrabee. Advanced Management, December 1953 (pp. 9-17).

Relationship of wage increases and overall productivity, and productivity and cooperation, are among the incentive plans discussed.

5.047. Our Miracle of Productivity. Washington: Chamber of Commerce of the United States, Economic Research Department, April 1954, Bull. No. 30 (7 pp.).

Traces the history of productivity increases in United States and stresses incentives, possible only in a free economy, as the primary factor responsible for these advances.

5.048. Predicting Group Productivity. Norman Gekoski. Personnel Psychology, Inc. Winter 1952 (pp. 281-292).

Relationship of group characteristics to industry productivity.

5.049. Productivity. Sir Geoffrey Heyworth. Advanced Management, March 1951 (pp. 14-18).

The chairman of Lever Brothers and Unilever describes how incentive plans and production studies have raised productivity in his firm's establishments in several countries.

5.050. Productivity: An Economic and Social Challenge to American Leadership. Leo Teplow. Advanced Management, February 1954 (3 pp.).

The major factors underlying our leadership in high productivity are: mechanical ingenuity; readiness to cooperate; our tremendous research facilities; and our patent system.

5.051. Productivity and Attitude Toward Supervisor. C. H. Lawshe and Bryant F. Nagle. Journal of Applied Psychology, June 1953, Vol. 37 (pp. 159-162).

The relationship between employee attitudes and productivity.

5.052. Productivity and Human Relations. W. Duane Evans. American Economic Review. May 1947 (pp. 412-422).

Basic causes for deliberate restriction in output practiced by workers and recommendations that an understanding of human behavior is essential to the solution of the problem.

5.053. Productivity, Employment, and Living Standards. Ewan Clague. U. S. Department of Labor, Bureau of Labor Statistics, 1949 (14 pp.).

Productivity levels in the United States and how these levels have been achieved.

5.054. Productivity in Coal Mines. Geneva: International Labour Office, Coal Mines Committee, 1951 (178 pp.).

Factors influencing productivity under four headings: natural conditions; technical conditions; organization and management and working conditions.

5.055. Productivity in the Salaried Organization. Merle C. Hale, Director, Salaried Personnel Activity, General Motors Corporation. Berkeley: California Personnel Management Association. Management Report No. 156, 1952 (14 pp.).

The role of the salaried organization in improving productivity. The bonus plan inaugurated by General Motors is described with results noted.

5.056. Productivity: How to Increase It. New York: National Industrial Conference Board, Conference Board Management Record, June 1950, Vol. 12 (pp. 226-227).

Summary of a conference at the 312th meeting of the National Industrial Conference Board in New York, March 23, 1950.

5.057. Productivity is an Attitude. Peter F. Drucker. Nation's Business, April 1952 (pp. 34 ff.).

A summary of conclusions reached by European businessmen, technicians, educators, workers and union officials after an examination of our economic system and industrial techniques.

5.058. Productivity of Food Marketing Personnel. Martin Kriesberg and R. W. Hoecker. U. S. Department of Agriculture. The Journal of Marketing, April 1954 (pp. 387-392).

How food marketing productivity can be improved.

5.059. Productivity of Labor. Geneva: International Labour Office. Report of Director General, 1950 (pp. 77-114).

Reviews the principal factors influencing the level and growth of productivity and suggests specific studies to be undertaken. Emphasizes the need for reconciling the claims of workers for security of employment and income with an all-out drive for higher productivity.

5.060. Productivity of Labor in Peace and War. Solomon Fabricant. New York: National Bureau of Economic Research, Occasional Paper No. 7, September 1942 (28 pp.).

Consideration of factors affecting output per man-hour during peace and war.

5.061. Productivity of Labor in the Cotton-Garment Industry. N. I. Stone. U. S. Department of Labor, Bureau of Labor Statistics, November 1938, Bull. No. 662 (139 pp.).

Data based on a field study made during 1934-36 in 116 plants. Organization of the industry, the machinery used and the processes of manufacture. Productivity data by operation, price of shirt, and system of production.

5.062. Productivity: Prospective Trends and Historical Factors. Leon Greenberg. Paper presented before the Dartmouth Conference on Economic Growth, Dartmouth College, June 21, 1956. U. S. Department of Labor, Bureau of Labor Statistics, 1956 (15 pp.).

Problems of measurement and factors affecting productivity.

5.063. Productivity Rush: Industry Boosts: Output per Worker to Trim Labor Material Costs. Wall Street Journal, August 9, 1955.

Methods employed by various manufacturers to attain greater productivity, with a discussion on the distribution benefits thus realized.

5.064. Productivity Stands Still. H. A. Balke and G. C. Thompson. National Industrial Conference Board, Conference Board Business Record, February 1952, Vol. 9 (pp. 72-77).

Factors responsible for gains or declines in productivity from a survey of 137 manufacturing firms.

5.065. Productivity: Still Going Up. Sumner Slichter. The Atlantic, July 1952, Vol. 190 (pp. 64-68).

Reason for the accelerated rate of productivity increases in United States.

5.066. Productivity, Supervision and Employee Morale. A report from the Survey Research Center of the University of Michigan, November 22, 1948, Study No. 6 (22 pp.).

Findings from a study of clerical workers in the Prudential Insurance Company of America.

5.067. Productivity, Supervision, and Morale Among Railroad Workers. Daniel Katz. Ann Arbor: University of Michigan, Survey Research Center, Institute for Social Research, 1951 (61 pp.).

Relationship of productivity with supervision and employee attitudes.

5.068. Productivity, Supervision and Morale in an Office Situation. Daniel Katz, Nathan Maccoby, and Nancy C. Morse. Ann Arbor: University of Michigan, Survey Research Center, Institute for Social Research, 1950 (84 pp.).

The relationship between productivity and various attitudes and actions of the supervisors and of members of the group from a study of 419 clerical employees and 24 supervisors in the home office of the Prudential Life Insurance Company.

5.069. Productivity, the Key to National Security. Harold Glenn Moulton. Time Study and Methods Conference Proceedings, 1951. Sponsored by the Society for Advancement of Management and the American Society of Mechanical Engineers. New York: Advanced Management, 1951 (pp. 52-59).

Factors influencing productivity such as the significance of scientific and technological advances, and improvements in business organization and managerial policies.

5.070. Progress in Productivity and Pay, All U. S. Manufacturing Combined. Allen W. Rucker. Cambridge: The Eddy-Rucker-Nickels Co., 1952 (72 pp.).

Productivity as a factor in wage policy.

5.071. Psychologists at Work. Business Week. September 19, 1953 (pp. 52-54).

Workers' attitude as a key factor in raising productivity.

5.072. Relation of Energy Output to Production in the United States. J. Frederic Dewhurst. Social Science, October 1948 (pp. 207-217).

The significance of the shift from animate energy sources to inanimate or mechanical energy.

5.073. "Research Findings in Employee Morale and Productivity" in Making Personnel Practices Pay Off. New York: American Management Association, Personnel Series No. 151, 1953 (64 pp.).

The responsibility of the supervisor in promoting productivity increases.

5.074. Restriction of Output Among Unorganized Workers. S. B. Mathewson. (With chapters by W. M. Leiserson, H. S. Dennison, and A. E. Morgan.) New York: The Viking Press, 1931 (212 pp.).

Examples of how and why workers and/or their immediate superiors restrict output. Based on interviews with approximately 350 workers and 65 executives.

5.075. The Role of Research in Economic Growth. R. H. Ewell. Chemical and Engineering News, July 18, 1955 (pp. 2980-2985).

Factors affecting productivity changes and the part research and development plays in productivity advances.

5.076. Science and the Changing Face of Industry--The Social Phase. Alexander King. Impact of Science on Society, March 1956, Vol. VII, No. 1 (pp. 3-30).

Summary of relationship of science to technological developments and productivity, plus comments on economic and social implications.

5.077. Significance of Nonmechanical Factors in Labor Productivity and Displacement. William G. Roylance. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1933 (pp. 1028-1038).

Increasing productivity through improving working conditions, the arrangement of tools and machinery, and standardization of materials.

5.078. The Supervisor and Productivity. Louis E. Davis. (Paper presented before Air Transport Association, Annual Engineering and Maintenance Conference, San Francisco, 1954.) Journal of Personnel Administration and Industrial Relations, Summer 1955 (pp. 56-74).

Raising productivity levels by utilizing potentials available in increased motivation.

5.079. Sure, I Could Produce More. Carlton Bradshaw. Harper's Magazine, May 1947, Vol. 194 (pp. 396-401).

A union member discusses the issue of motivating workers to produce more goods.

5.080. Technology Takes Over the Farm--and the Farmer. Business Week, June 6, 1953 (pp. 116-126).

Factors in farm production increases over the past 15 years.

5.081. U. S. Output Gains Found Decreased. Joseph A. Loftus. New York Times, November 23, 1956 (1 p.).

The causes and possible results of a productivity slowdown between first half of 1955 and first half of 1956.

5.082. What Ails Productivity? Business Week, May 5, 1951 (pp. 64-72).

Solomon Fabricant is questioned about the factors affecting the apparent decline in manufacturing productivity during the 1940's.

5.083. What Makes America's Industry Strong? Harry Lee Waddell. Factory Management and Maintenance, February 1951, Vol. 109 (pp. 80-83).

Excerpts from Anglo-American team reports on American attitudes that promote high productivity.

5.084. What Makes Them Want to Work? Business Week, August 28, 1954 (pp. 119-131).

Factors that influence the productivity and the satisfaction of workers in large organizations.

5.085. What's Behind the New Farm Crisis. Business Week, December 10, 1955 (pp. 106-126).

New techniques, more machinery and multiplied use of fertilizer as key factors in the farmer's economic progress.

5.086. The Why and How of Wage Incentives. Bruce Payne. Dun's Review and Modern Industry, January 1954 (pp. 60-62 ff.).

The necessity of a well thought-out plan to increase productivity by incentive programs.

6.087. Will to Work More Effectively. R. C. Cooper. Advanced Management, July 1952, Vol. 17 (pp. 14-16).

Principles to follow in influencing the will of the employees to work more effectively to increase labor productivity.

449922 O - 58 - 8

5.088. Winning Workers to Productivity. Modern Industry (now Dun's Review and Modern Industry), December 1946 (pp. 49-52).

The results of a special study of plants aimed to overcome employee opposition toward increasing productivity.

SECTION VI

PRODUCTIVITY AND THE ECONOMY

(Includes material dealing with the relationship of productivity to economic growth).

6.001. Advances in Productivity--Past, Present and Future. Eighth Annual Labor-Management Conference. Institute of Management and Labor Relations, April 25, 1956 (94 pp.).

Examination of available information regarding the statistics of past and likely future increases in productivity and analysis of the potential impact on industry and commerce. Papers: What is Happening to Productivity? Ewan Clague; The Outlook for Increasing Productivity, Elmer C. Easton; Technology and the Human Factor, Robert H. Guest; A Labor Viewpoint, Elmer Walker; A Management Viewpoint, I. D. Robbins.

6.002. The American Economy in 1970. Engineering News Record. February 17, 1955 (pp. 68-78).

Estimates of productivity changes over the years for selected services and manufacturing industries.

6.003. The American Economy -- Its Problems and Prospects. Sumner Slichter. New York: Alfred A. Knopf, Inc., 1948 (214 pp.).

Basic characteristics of the American economy. The long-run prospects and the outlook with regard to living standards are analyzed and appraised in the final chapters.

6.004. The American Economy -- Prospects for Growth 1950-1960-1970. New York: McGraw-Hill Publishing Company, 1954 (p. 21 ff.).

An assumed productivity increase is used in projections of the national economy.

6.005. American Productivity and Full Employment. Paul Stanchfield. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, February 1952 (pp. 125-129).

An analysis by a French study group.

6.006. America's Needs and Resources. J. Frederic Dewhurst and Associates. New York: The Twentieth Century Fund, 1947 (812 pp.).

Includes a chapter on the 1950 and 1960 patterns of such basic statistics of the economy as productivity, employment, income consumption, and expenditures, based on prewar and current economic trends.

6.007. America's Needs and Resources, A New Survey. J. Frederic Dewhurst and Associates. Sequence to America's Needs and Resources, published in 1947. New York: The Twentieth Century Fund, 1955 (1148 pp.).

Includes a chapter on technological advances, new products and techniques, welfare, and their effects on American productivity and the economy as a whole.

6.008. Can We Survive Technology. John Von Neumann. Fortune, June 1955 (pp. 106-108).

A look at man's economic prospects by 1980.

6.009. Controlling Factors in Economic Development. Harold G. Moulton. Washington: The Brookings Institution, 1935 (398 pp.).

Forces and factors which accounted for the economic progress of the nineteenth and early twentieth centuries, an estimate of the economic potentialities of the century ahead, and productivity's contribution to this progress.

6.010. Economic Challenge of Longevity. Allen W. Rucker. Harvard Business Review, November 1954 (pp. 94-102).

Projecting economic factors, 1910-1953-1975.

6.011. The Engine: Rising Productivity. Gilbert Burck. Fortune, January 1955, Vol. 51 (pp. 66-69 ff.).

One of a series on "The New Economy" dealing with productivity from a broad historical approach and viewing with optimism the prospects for continuous American advance. Two pages of charts contain international comparisons and trends for farm and nonfarm products.

6.012. A Forecast of Production in 1980. Business Week, August 15, 1953 (pp. 158-165).

A report to executives on estimated economic and technological changes in industry by 1980.

6.013. Forecasting Postwar Demand: III. Jacob L. Mosak. Econometrica, January 1945, Vol. 13 (pp. 25-37).

Forecast of Gross National Product assuming 1944 productivity level.

6.014. The General Outlook for the American Economy, 1949-1960. New York: The Econometric Institute, Inc., June 1949 (46 pp.).

Statistics of population, industrial production, labor force, employment, productivity, unit labor costs and prices, and income are forecast for the period 1949 to 1960.

6.015. The Growth Potentials of Our Economy. (from Economic Report to Congress), U. S. News and World Report, January 28, 1955 (p. 45).

Productivity increases and useful employment opportunities as the core to economic expansion.

6.016. Growth Trends in Productivity, Consumption, and Investment. Hans Apel. Social Research, Summer 1956, Vol. 23 (pp. 127-150).

Fundamental implications of productivity trends during the last quarter of a century for the consumption function as well as for the growth requirements of the economy at large.

6.017. The Influence of Productivity on Economic Welfare. J. Tinbergen. Economic Journal, March 1952, Vol. 62 (pp. 68-86).

The effects of an increase in productivity on different types of economic models. Concludes that an increase in productivity does not invariably lead to favorable results.

6.018. Jobs After the War. E. A. Goldenweiser and Everett E. Hagen. Federal Reserve Bulletin, May 1944, Vol. 30 (pp. 424-431).

Estimated gross national product per worker in 1947 based on an assumed productivity increase.

6.019. Living Costs, Prices and Productivity. Frederick C. Mills. Review of Economics and Statistics, February 1948 (pp. 6-8).

Discussion of United States Economic problems 1939-47 and suggestions on how to adjust for sound economic growth.

6.020. Living Standards and Productivity. Jesse Burkhead. Review of Economics and Statistics, August 1951, Vol. 33 (pp.241-247).

The relationship between personal disposable income and gross national product, and the factors which determine the level of gross national product. Productivity changes for the economy as a whole from 1940 to 1949.

6.021. Long Range Economic Projection. Princeton: Princeton University Press, Studies in Income and Wealth, 1955, Vol.

A chapter by John W. Kendrick, entitled "National Productivity and its Long-Term Projection," (pp. 67-104).

6.022. National Income, A Summary of Findings. Simon Kuznets. New York: National Bureau of Economic Research, 1946 (144 pp.).

The structure of national income during the two decades between the two world wars, and the longer term changes in it and its components, as revealed by estimates for the seven decades 1869-1938.

6.023. The National Output at Full Employment in 1950. Everett E. Hagen and Nora Boddy Kirkpatrick. The American Economic Review, September 1944, Vol. 34 (pp. 472-500).

An analysis of 5 components of the economic system: the Armed Forces, civilian government, agriculture, "Industry Group A" (mining, manufacturing, railroads, electric power and gas utilities, and construction), and "Industry Group B" (trade, communications and all other nonagricultural industry). Productivity trends ("gross value added" in 1939 prices per man-hour for Industry Group A and Industry Group B) were extrapolated to 1950.

6.024. National Productivity and Its Long-Term Projection. John W. Kendrick. Long-Range Economic Projection. New York: National Bureau of Economic Research, 1954, Vol. 16 (pp. 67-104).

The projection problem of the productivity concept in a gross national product framework, in the aggregate, and by industry.

6.025. A National Prosperity Program for 1955. Washington: Conference on Economic Progress, February 1955 (66 pp.).

The attainment of a national prosperity budget. A chapter is devoted to productivity and technology.

6.026. The New Society. The Anatomy of the Industrial Order. Peter F. Drucker. New York: Harper and Brothers, 1950 (337 pp.).

Traces industrial progress in the United States and discusses the sociological effects of mass production and increased productivity.

6.027. Population Booms Call for Rising Productivity. Federal Reserve Bank, Chicago Business Conditions, December 1953 (pp. 11-14).

Relation between population growth, changing age distribution and rising productivity.

6.028. Postwar Economic Perspectives. W. S. Woytinsky. U. S. Social Security Board, Social Security Bulletin, December 1945, Vol. 8 (pp. 18-29); January 1946, Vol. 9 (pp. 8-16); February 1946 (pp. 9-16); March 1946 (pp. 11-25).

Probable productivity changes between 1940 and 1950, noting experiences upon which given forecasts are based.

6.029. Postwar Income Potentials in Measuring and Projecting National Income. S. Morris Livingston. New York: National Industrial Conference Board Report, March 1945 (pp. 23-27).

A discussion of the size of the labor force, the amount of unemployment, and the growth of output per worker in projecting national income.

6.030. Postwar Manpower and its Capacity to Produce. S. Morris Livingston. Survey of Current Business, April 1943, Vol. 23 (pp. 10-16).

Potential output in 1946 based on an assumed labor force and productivity growth rates.

6.031. Postwar National Income -- Its Probable Magnitude. Joseph Mayer. Washington: The Brookings Institution, 1944 (34 pp.).

Probable changes in productivity for the war and immediate postwar periods.

6.032. Power, Machines, and Plenty. Gloria Waldron and J. Frederic Dewhurst. New York: The Twentieth Century Fund, Public Affairs Pamphlet No. 142, 1948 (31 pp.).

The growth of industrial mechanization, relationship of increased productivity to living standards, and a forecast of future economic conditions.

6.033. Prices, Productivity, and Factor Return Assumptions in Long-Range Economic Projections. Marvin Hoffenberg. Paper presented at the 116th Annual Meeting, Detroit, 1956. Washington: American Statistical Association, Proceedings of the Business and Economic Statistics Section. 1955-56 (pp. 16-21).

Discussion of the relationship among productivity, factor returns, and price assumptions in long-range economic models.

6.034. The Production Economics of Growth. W. Duane Evans. U. S. Department of Labor, Bureau of Labor Statistics. Paper presented to the American Economic Association, New York City, December 28, 1955 (17 pp.). Also in American Economic Review, May 1956, No. 2 (pp. 42-54).

The importance of technology in the economic growth in the United States. Evaluations and comparisons of the economic theories by J. Frederic Dewhurst, John W. Kendrick, W. S. Woytinsky, George J. Stigler and others.

6.035. Productivity and Consumption Trends. J. Frederic Dewhurst. New York: Twentieth Century Fund. Paper presented at the Boston Conference on Distribution, October 17, 1955 (10 pp.).

The importance of productivity-consumption trends in maintaining American economy at a higher level than in any other country.

6.036. Productivity and Economic Progress. Frederick C. Mills. New York: Bureau of Economic Research, Inc., Occasional Paper No. 38, 1952 (35 pp.).

The influence of the productivity increment on economic growth in the United States in the last half century.

6.037. Productivity and the American Standard of Living. Frederic J. Dewhurst. Pittsburgh: University of Pittsburgh, Institute of Business and Economic Problems, 1949 (pp. 110-114).

Productivity as a contributing factor in the rapid rise in the standard of living in the United States over the past several decades.

6.038. Productivity: Key to Plenty. The Twentieth Century Fund, and Encyclopedia Britannica Films, Winter 1953. (Encyclopedia Britannica Films, Inc., is the films distributor in the U. S. and abroad.)

Based on "America's Needs and Resources," this film is an imaginative explanation of what productivity is and how it affects our standard of living. It is designed for upper grades in high school, the college level, and adult groups.

6.039. Progress through Productivity. Ernest T. Weir. New York, San Francisco, Montreal: The Newcomen Society in North America, 1952 (28 pp.).

The necessity for productivity increases from the early 1700's. The span of progress over the years for individual plants and industries.

6.040. Progress Unlimited. National City Bank New York, Monthly Letter, December 1954 (4 pp.).

The growth of Gross National Product since 1909 and projections to 1970 and factors involved in the growth.

6.041. Prospects of Permanent Full Employment. W. S. Woytinsky. American Labor Conference on International Affairs, International Postwar Problems, September 1944, Vol. 1 (pp. 485-515). (Quarterly publication discontinued January 1946.) o. p.

A forecast of economic progress based on projected productivity trend.

6.042. Race of Productivity; Abstract. Louis Polk. Tool Engineer, July 1956 (pp. 193-194).

Technological growth of U. S. from 1930 with projections to 1980.

6.043. Rising Productivity, Maintaining Prosperity. Washington: Congress of Industrial Organizations (now AFL-CIO), Spring 1953 (pp. 12-16).

Long-run productivity increases and the part future changes must play in our expanding economy.

6.044. Second Industrial Revolution. Wendell B. Barnes. Vital Speeches, April 1, 1955, Vol. 21 (pp. 1147-1152).

The impact of technological progress on economic advances over the last half century.

6.045. The Secret of American Prosperity. William E. Rappard. New York: Greenberg Publisher, 1955 (124 pp.).

American productivity superiority is proven historically with international comparisons.

6.046. Sharing Productivity Increases. Economic Outlook, Congress of Industrial Organizations (now AFL-CIO, April 1954 (8 pp.).

Charts showing changes in output per man-hour in the private economy 1939 to 1953, based on John Kendrick's National Productivity and Its Long-Term Projection.

6.047. Sharing the Gains of Productivity. Washington: AFL-CIO, Labor Economic Review, June-July 1957, Vol. 2 No. 6 (pp. 41-48).

The promise of increasing productivity in its broadest definition: output per man-hour of work; output per unit of investment in factories and machines; output per unit of raw materials, in promoting improvements in national strength and living conditions.

6.048. A Short History of Technology. Harold G. Bowen and Charles F. Kettering. West Orange: The Thomas Edison Foundation, Inc., 1954 (110 pp.).

The progress of technology through the ages including the ever increasing productivity per man through mechanization.

6.049. Some Measures of Changing Labor Productivity and Their Use in Economic Analysis. David Weintraub. Journal of the American Statistical Association, March 1938, Vol. 33 (pp. 153-163).

Examples of difficulties encountered in relating productivity measures to economic changes.

6.050. Technology and the Standard of Living in the United States. W. F. Ogburn. University of Chicago, American Journal of Sociology, January 1955, Vol. 60 (pp. 380-386).

Improvements in technology studied as the chief factor in increased living standards, 1900-1950.

6.051. Two Industrial Leaders Look Ahead 20 Years. U. S. News and World Report, May 13, 1955 (2 pp.).

Benjamin F. Fairless of the U. S. Steel Corporation and Lester L. Colbert, President of Chrysler Corporation, emphasize productivity's part in our economic growth.

6.052. U.S.A. -- 1975. Dr. Weldon B. Gibson. An address in the College Lecture Series, San Jose State College, California. Stanford Research Institure, December 1954 (18 pp.).

Productivity projected to 1975 (based on deflated Gross National Product data).

6.053. What's Happening to Productivity? Burnham Finney. American Machinist, January 30, 1947 (pp. 93-100).

Trends in productivity for the economy as a whole and for six typical metalworking companies.

6.054. The World of Tomorrow: What Will it be Like? Chamber of Commerce of the United States, Economic Research Department, 1956 (32 pp.).

Traces past growth and projected economic trends for ten to twenty years, including productivity's contribution to progress.

6.055. Yardsticks of Productivity. Ewan Clague. The Tool Engineer, June 1954 (pp. 191-192).

Productivity as one of the dynamic factors of any economic system, with a discussion of its many forms and uses.

SECTION VII

SIGNIFICANCE OF PRODUCTIVITY CHANGE

(See also Sections I, II and VI).

7.001. American Productivity, Our Protection and Our Danger. Dr. J. Hersch. The Commercial and Financial Chronicle, March 7, 1946, Vol. 163 (pp. 1214, 1240-1241).

The danger that productive capacity will outrun the capacity to consume, as a negative result of our rapidly increasing productivity.

7.002. The Automatic Factory. Fortune, October 1953 (pp. 168-171).

A round table discussion by men from industry and the sciences of the future of American productivity.

7.003. Changes in Prices, Manufacturing Costs and Industrial Productivity, 1929-1934. Frederick C. Mills. New York: National Bureau of Economic Research, Inc., December 22, 1934, Bull. No. 53 (pp. 1-4).

Price movements related to cost and productivity factors.

7.004. The Coordination of Supply and Demand Assumptions in Long-Range Economic Projections: Product Mix, Capital Investment, and Productivity. Louis Weiner. Paper presented at the 116th Annual Meeting, Detroit, 1956. American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1955-56 (pp. 11-16).

Evaluating the extent to which supply and demand assumptions in economic projections are interrelated, with special reference to product mix, capital investment, and productivity.

7.005. Cost Behavior and Price Policy. Committee on Price Determination, New York: National Bureau of Economic Research, 1943 (356 pp.).

Stress on productivity indexes as measures of technical change and factors influencing productivity.

7.006. Cost Reduction: A Postwar Problem. Ewan Clague. A paper presented at the Office Management Conference, American Management Association, New York, October 20, 1949. U. S. Department of Labor, Bureau of Labor Statistics, 1949 (14 pp.).

Importance of cost reductions through increased industrial efficiency. Presents BLS productivity measures.

7.007. Did Productivity Increase in the Twenties? Elmer C. Bratt. Journal of American Statistical Association, June 1939, Vol. 34 (pp. 326-334).

Productivity as an important statistical measurement in studying employment opportunities; broadening scope of labor administration; making the proper provision for the needs of growth; and understanding the possibilities of achievement between various economic processes.

7.008. Economic Policy and Full Employment. Alvin Hansen. New York: McGraw-Hill Publishing Co., 1947 (340 pp.).

Examines contemporary economic policy, analyzes the problems that confront the social and economic planner, and suggests basic policies needed for full employment.

7.009. Economic Tendencies in the United States; Aspects of Pre-War and Post-War Changes. Frederick C. Mills. New York: National Bureau of Economic Research, Inc., 1932 (639 pp.).

The dominant tendencies prevailing in our economy between 1922 and 1929 are contrasted with the characteristics of the pre-1914 era of expansion. For a discussion of productivity, see especially pp. 25-49, 289-314.

7.010. Effects of Increased Productivity Upon the Ratio of Urban to Rural Population. Herbert Simon. Econometrica, January 1947 (pp. 31-42).

A shift of labor from agricultural to nonagricultural occupations will result from increases in productivity.

7.011. Employment in Relation to Technical Progress. H. Staehle. A Review of Economics and Statistics, May 1940 (pp. 94-100).

The general problem of technological unemployment in the United Kingdom, 1930-35.

7.012. An Evaluation of B.L.S. Data on Productivity. Washington: AFL-CIO, Wage Research Committee, January 1946 (25 pp.).

A critical analysis.

7.013. The Four-Day Week: How Soon? Daniel Seligman. Fortune, July 1954 (pp. 81 ff.).

A continuation of increasing productivity in the United States industry as a major factor which will make a shorter workweek possible.

7.014. French Study Group in Productivity and Full Employment. Provisional Report. U. S. Department of Labor, Bureau of Labor Statistics, Joint ECA-BLS Project, TA 38-143, December 1951 (46 pp.).

Application of American production principles to the French economy.

7.015. How to Double Wages. Washington: Chamber of Commerce of the United States, Leaflet, 1955 (12 pp.).

Factors responsible for our rising standards of living and economic progress.

7.016. Importance of Increased Attention to Productivity. Ewan Clague. Paper presented before 4th Annual Production Conference of the Philadelphia Chamber of Commerce, Philadelphia, Pennsylvania, March 20, 1951. U. S. Department of Labor, Bureau of Labor Statistics (3 pp.).

Historical importance of productivity changes and future need for efforts to promote higher productivity.

7.017. Increasing Productivity, Income Price Trends and the Trade Balance. H. G. Johnson. Economic Journal, September 1954, Vol. 64 (pp. 462-485).

The choice between secular deflation and depreciation.

7.018. Industrial Productivity and Economic Equilibrium. John D. Gill. The Commercial and Financial Chronicle, April 10, 1947 (pp. 12 and 38).

A proposal that an equilibrium index be established; the principal components would be employment levels, profits, inventories, and standard of living.

7.019. International Reduction of Working Hours as Consequence of Rising Labor Productivity. AFL-CIO. Internation Labor Relations Committee, Communication from the American Federation of Labor, Lake Success, 1949 (20 pp.).

A 40-hour week as a goal in all United Nation countries and a further reduction in economically advanced countries.

7.020. Jobs, Productivity and Full Employment. Richard C. Wilcock. Urbana: University of Illinois, Illinois Business Review, August 1955 (pp. 6-8).

An analysis of productivity-full employment relationship, and productivity and jobs in manufacturing.

7.021. The Key to Better Days. Julius Hirsch. Chamber of Commerce of United States, Washington: Nation's Business, April 1950, Vol. 38, No. 4 (pp. 72-76).

Advocates a new national policy on productivity in which government, management, labor, and science will collaborate in an all-out effort toward higher productivity.

7.022. Labor Productivity and Technological Advances. Albert Ramond. New York: American Management Association, Series No. 163, 1946 (pp. 17-27).

The necessity and means for promoting productivity increases in industry.

7.023. Mechanization in the Lumber Industry. A. J. Van Tassel and D. W. Bluestone. United States Workers Progress Administration, National Research Project, March 1940, Report No. M-5 (201 pp.). o. p.

The relationships between technological developments, timber depletion, and employment opportunities. Indexes of unit labor requirements for the Southern and Pacific Coast regions, 1920-35.

7.024. The Miracle of Productivity. New York: National Industrial Conference Board, Studies in Business Economics, November 9, 1947 (47 pp.).

A forum of sixteen economists from universities, government, management, and labor participated on the implications and significance of productivity to our economy.

7.025. Modern Science and Management Creating a New Industrial Revolution. Solomon Barkin. AFL-CIO, Textile Workers Union of America, 1955 No. P-208 (9 pp.).

Reprint of a discussion on automation, productivity and industrial relations from proceedings of the Seventh Annual Meeting, Industrial Relations Research Association, held in Detroit, December 1954.

7.026. National Productivity: Its Relationship to Unemployment-in-Prosperity. Benjamin Graham. American Economic Review, May 1947 (pp. 384-396).

The effects of productivity on employment.

7.027. Of Productivity Statistics: An Admonition. Solomon Fabricant. Review of Economics and Statistics, November 1949 (pp. 309-311).

The deficiencies and limitations in productivity measurement.

7.028. Only More Production Can Offset Inflation. Factory Management and Maintenance, January 1948, Vol. 106, No. 1 (pp. 65-70).

Improving productivity is stressed as the key factor in expanding industrial production.

7.029. Our Living Standards Can Go Up. P. D. Foote. Advanced Management, May 1953 (pp. 5-11).

A study of high United States standard of living based on increased labor productivity through technological advances.

7.030. The Primary Employment Effects of Productivity Gains. Eric Schiff. Chicago Council for Technological Advancement, January 15, 1954, CTA Bull. No. 19 (23 pp.).

A method of estimating the primary disemployment resulting from productivity increases. Economic models are developed in the analysis.

7.031. Proceedings of the Conference on Productivity, June 4, 1949. Milwaukee: University of Wisconsin Industrial Relations Center, 1949 (42 pp.).

(1) Martin Gainsbrugh, Chief Economist, National Industrial Conference Board, New York, discussed the current business outlook and the relationship of productivity to the business environment; (2) Joseph Scanlon, Massachusetts Institute of Technology, Cambridge, Massachusetts, discussed the workers' potential contribution to increased productive efficiency; and (3) Ewan Clague, Commissioner of Labor Statistics, Washington, D. C., compared European productivity and standards of living with those of the United States. An open forum, with questions from the floor, centered largely around the problems involved in distributing the gains of productivity.

7.032. Proceedings of the Conference on Productivity, 1950. Milwaukee: University of Wisconsin Industrial Relations Center, 1950 (42 pp.).

(1) Ivan C. Lawrence, Minnesota Mining and Manufacturing Company, St. Paul, Minnesota, discussed productivity as it relates to the standard of living from the management point of view. (2) Sidney Garfield, International Chemical Workers Union, AFL, discussed workers' attitudes toward productivity changes.

7.033. Productivity A Restraining Price Influence. Boot and Shoe Recorder, April 1, 1956 (pp. 22-23).

Review of a report by the Boot and Shoe Union on the effect of productivity increases on the manufacturer, the worker, the retailer, and the consumer.

7.034. Productivity and Economic Progress. John W. Kendrick. Challenge Magazine, November 1956 (pp. 31-35).

Productivity advance as a basic index of the underlying health and creative dynamism of our type of economy.

7.035. Productivity and Economics. Jean Fourastié. New York: Columbia University, Political Sciency Quarterly, June 1951, Vol. 66, No. 2 (pp. 216-225).

A review of the economic consequences of productivity changes.

7.036. Productivity and Employment 1955-1965. Stephen Raushenbush. Washington: The Public Affairs Institute, 1956 (63 pp.).

Increased productivity is analyzed as one of the factors which may produce a major change in working time arrangements for most of the economy by 1965.

7.037. Productivity and Labor Cost Trends. Gertrude Deutsch. New York: National Industrial Conference Board, Conference Board Business Record, May 1947 (pp. 121-124).

Increased productivity as the means to offset rising labor costs and uncertain prices.

7.038. Productivity and Living Standards. W. Duane Evans. New York: National Conference of Social Work Proceedings, 1947 (pp. 96-102).

The role played by increasing productivity in eliminating child labor, reducing hours of work, and maintaining full employment.

7.039. Productivity and Living Standards. Jules Backman and Martin R. Gainsbrugh. New York: Cornell University Press, Industrial and Labor Relations Review, January 1949 (pp. 164-194).

The meaning and measurement of productivity, long-term gains, World War II and postwar trends, international comparisons, and the most effective way to distribute the gains.

449922 O - 58 - 9

7.040. Productivity and Progress. The First National Bank of Boston, New England Letter, July 31, 1956 (pp. 2-3).

The significance of productivity changes 1947-56.

7.041. Productivity and the Worker. W. C. Balfour. Los Angeles: University of Southern California, Sociology and Social Research, September 1953 (8 pp.).

Observations on the American worker's productivity from reports issued by the Anglo-American productivity teams.

7.042. Productivity: Gauge of Economic Performance. George G. Hagedorn. New York: National Association of Manufacturers, Research Department, September 1955 (48 pp.).

Three major sets of studies of productivity factors involved and the relationship to wages.

7.043. Productivity: Gauge of Economic Performance Instructor's Manual. New York: National Association of Manufacturers, Educational Department, Catalog No. 124-A, September 1955 (16 pp.).

This manual and the study by the same title are presented as an educational aid for colleges.

7.044. Productivity in Industry--A Round Table Discussion. Ewan Clague, John T. Dunlop, George G. Hagedorn. New York: National Industrial Conference Board, Inc., 1956 (40 pp.).

Papers delivered at the 364th Meeting of the Conference Board, January 20, 1956.

7.045. Productivity in Research and Development. Ralph M. Hogan. Science Monthly, November 24, 1952, Vol. 112 (pp. 613-616).

Productivity in the field of research and development from the point of view of the personnel administrator.

7.046. The Productivity of Labor: A Note on Terminology and Method. Witt Bowden. Journal of Political Economy, December 1938, Vol. 46 (pp. 857-863).

The views of other eminent authorities on the subject and a discussion on differences of opinion.

7.047. Productivity Rise Ahead. Fortune, December 1956 (p. 36 ff.).

Significance of productivity changes since 1953 with a forecast through 1957.

7.048. Productivity: The Great Age of 3%. Gilbert Burck and Sanford Parker. Fortune, November 1955 (pp. 102-105 ff.).

Prediction based on past experiences of a 3% annual average productivity increase 1955-80.

7.049. Productivity, the Key to Prosperity. Charles D. Stewart. Storrs: University of Connecticut, Labor Management Institute, Bull. No. 1, 1948 (pp. 10-17).

Productivity studies of the Bureau of Labor Statistics are summarized with particular reference to their use by management and workers in further stimulating productivity increases.

7.050. Productivity, Thrift and the Rate of Interest. R. W. Clower. Economic Journal, March 1954, Vol. 64 (pp. 107-115).

The indirect influences of current productivity changes on the rate of interest as a determinant of a future rate of interest.

7.051. Productivity Trends. Milton Lipton. The Conference Board Business Record, February 1956, Vol. 13 (pp. 54-58).

The first of a three-part series, dealing with the facts and implications of productivity in American industry. The influence of labor and capital inputs on the rising trend of national output.

7.052. Productivity Trends: Portents of the Future. Milton Lipton. The Conference Board Business Record, April 1956, Vol. 13 (pp. 148-152).

The second of a three-part series dealing with productivity in American industry, views potential economic growth from the perspective of related trends in output per man-hour, business investment, and spending-saving decisions.

7.053. Productivity Trends: What the Averages Conceal. Milton Lipton. The Conference Board Business Record, June 1956, Vol. 13 (pp. 246-250).

Third of a three-part series, dealing with the productivity in American industry, reviews some of the myriad diversities that lie behind productivity trends.

7.054. Productivity U.S.A. and Full Employment. E. Wenger. Paris: European Productivity Agency, Trade Union Information and Research Service, 1955 No. 5 (pp. 22-23).

The reaction of a European Trade Unionist after a visit to United States early in 1955.

7.055. Productivity, Wages and the Balance of Payments. Svend Laursen. Review of Economics and Statistics, May 1955, Vol. 37 (pp. 180-188).

Study of the validity of the argument that differences in national rates of productivity growth is one of the factors which has contributed to the imbalance in the world economy.

7.056. Productivity: Who Gets the Benefits? G. O. Carr. Iron Age, December 11, 1952 (pp. 99-100).

How industry, workers and customers all share in the benefits from higher productivity.

7.057. Recent Productivity Trends and Their Implications. W. Duane Evans. Journal of the American Statistical Association, June 1947 (pp. 211-223).

The significance of productivity changes.

7.058. Recent Productivity Trends and Their Implications. Ewan Clague. Paper presented before the 312th Regular Meeting of the National Industrial Conference Board, New York, March 23, 1950. U. S. Department of of Labor, Bureau of Labor Statistics, 1950 (15 pp.).

Importance of productivity changes in relation to industrial progress. Includes productivity measures for a number of industries.

7.059. The Relationship Between Total Output and Man-Hour Output in American Industry. Henry M. Oliver, Jr. Quarterly Journal of Economics, February 1941, Vol. 55 (pp. 239-254).

A comparison of Federal Reserve Board production indexes and BLS employment data for the period 1933-38.

7.060. Role of Productivity in Economic Growth. F. C. Mills. The American Economic Review, Papers and Proceedings, May 1952, Vol. 42 (pp. 545-557).

Traces productivity changes in the United States from 1899-1950 and effect of these changes on economic progress.

7.061. The Shifting Employment Pattern. Business Week, February 1956 (pp. 144-146).

Productivity as a factor in this shift.

7.062. The Significance of Productivity Data. John Diebold. Harvard Business Review, July 1952, Vol. 30 (pp. 53-63).

Variations in productivity changes from year to year, from industry to industry, and from plant to plant.

7.063. Social Climate and Productivity in Small Military Groups. Stuart Adams. American Sociological Review, August 1954, Vol. 19 (pp. 421-425).

The relationship between equalitarian social attitudes and group performance in a military setting.

7.064. Survey of Economic Theory on Technological Change and Employment. Alexander Gourvitch and others. United States Workers Progress Administration, National Research Project, July 1939, Report No. G-5 (254 pp.). o. p.

Analyzes the theoretical literature relevant to the relationship of technological change, and employment and unemployment.

7.065. Technological Change and Productivity. W. Duane Evans. Social Science, January 1949, Vol. 24 (pp. 15-21).

The social effects of steadily increasing levels of productivity in the United States.

7.066. Technological Change, Ideology, and Productivity. Yale Brozen. New York: Columbia University, Political Science Quarterly, 1955 (pp. 522-542).

The individual's part in increasing productivity. Decentralized initiative is explained as a precondition for rapid progress in productivity.

7.067. Technological Innovations and the Changing Socio-economic Structure. A. D. Jaffe. Science Monthly, August 1948, Vol. 67 (pp. 93-102).

The influence of technology on class structure and standards of living in the United States.

7.068. Technology: The Automatic Factory. Fortune, October 1953 (pp. 168 ff.).

A round table at which sixteen men from industry and the sciences, exchange shoptalk on the future of American productivity.

7.069. 3 Keys to More Productivity. Malcolm P. Ferguson. Nation's Business, March 1957 (pp. 48-58).

Increased productivity as the key to our economic progress--higher standard of living, relatively lower prices, lower unit cost of production and services, shorter working hours, and other benefits.

7.070. Time for Living. George Soule. New York: The Viking Press, 1955 (184 pp.).

The growth of technology in the United States and the accompanying rise in manufacturing productivity.

7.071. Toward Full Employment and Full Production. Washington: Conference on Economic Progress, July 1954 (44 pp.).

Productivity increases and technological advances are given due credit in this forecast of economic growth.

7.072. Trends in Equipping the American Worker. Washington: Council for Technological Advancement, No. 4 of a Series on Technology and Employment, July 1956 (22 pp.).

The parallel between investment in technology and improvement in living standards and employment.

7.073. Under-Employment of Rural Families. Washington: U. S. Congress, Joint Committee on the Economic Report, 1951 (74 pp.).

Suggestions for increasing the productivity of the rural underemployed, and thus improving their standard of living.

7.074. Unemployment and Increasing Productivity, in Technological Trends and National Policy. David Weintraub. United States Workers Progress Administration, National Resources Committee, 1937, Section V, Part K (pp. 67-87). o. p.

Statistical information on the volume of production and employment in the light of the changes in output per man-year, 1920-1935.

7.075. Unemployment Outlook. Fortune, May 1954 (pp. 30 ff.).

The prospect of rising productivity and the effect on the unemployment outlook.

7.076. Where Freedom Begins. C. Luckman. Vital Speeches, July 15, 1948, Vol. 14 (pp. 583-586).

A plan to create a Joint Productivity Clinic to formulate and put into practice procedures to secure increased productivity.

SECTION VIII

PRODUCTIVITY, WAGES, AND PRICES

8.001. AFL Demands Wage Boost on Productivity Raise. Boris Shishkin. (Report of the AFL Executive Council.) AFL News Reporter (now AFL-CIO News), February 13, 1953, Vol. 2 (pp. 1-4).

A report showing that the increase in the productivity index is almost double the increase in the wage index since 1939.

8.002. Agreement Between General Motors Corp. and the United Automobile Workers Union of America, CIO (114 pp.), with Supplement (84 pp.). Agreements. United Automobile Workers, CIO. Research Department, May 29, 1950.

Cost of living adjustments, guaranteed wages, annual productivity increase, modified union shop, pension plan, and the insurance program are analyzed.

8.003. Applications and Problems of Productivity Data. Charles E. Young. Journal of the American Statistical Association, December 1946, (pp. 421-431).

The close relationship between real wages and output per man-hour is discussed in connection with the question of wage increases.

8.004. Bargaining on Productivity--A Management Guide. Frederick Rudge. Washington: Bureau of National Affairs, Inc., 1953 (146 pp.).

Suggests the methods by which further effective research may be carried forward in the use of productivity as a wage determinant, and outlines how management can best prepare itself to bargain in this area.

8.005. Basic Criteria Used in Wage Negotiations. Sumner H. Slichter. Chicago Association of Commerce and Industry, 1947 (56 pp.).

One of the seven basic criteria used in wage negotiations is changes in productivity. This factor as a wage determinant is analyzed.

8.006. Behavior of Wages. New York: National Industrial Conference Board, Studies in Business Economics, Conference Board Business Record, November 1948, No. 15 (96 pp.).

A chapter is devoted to the relationships between changes in real earnings and in productivity.

8.007. The Committee on Economic Development Report on Real Wage Trends. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1950 (pp. 238-239).

A summary on report "How to Raise Real Wages."

8.008. The Economics of the Annual Improvement Factor. Jules Backman. New York University Business Series, 1952, No. 10 (72 pp.).

Shows productivity as a major, but only one, factor that should enter into wage determination. How wide discrepancies can develop between actual productivity changes within individual industries and in the economy as a whole, and the uniform wage increases that would be effected by an annual improvement factor.

8.009. Enterprise for Everyman. R. W. Davenport. Fortune, January 1950 (pp. 55-59).

A case history of how the Scanlon Plan as applied by union and management at Lapointe Machine Tool Company in Hudson, Massachusetts has raised productivity, profits, and pay.

8.010. Facts on Steel: Profits, Productivity, Prices and Wages. United Steel Workers of America, July 1956 (51 pp.).

A set of bargaining proposals compiled by the Steelworkers union as presented to the steel industry in 1956.

8.011. The General Motors Wage Agreement of 1948. Arthur M. Ross. Review of Economics and Statistics, February 1949 (pp. 1-7).

Deals primarily with two important issues--the extent to which increased productivity should lead to a rise in wages, and whether the corresponding gains should be retained within the industries responsible for them or be passed on to all workers.

8.012. How Shall Productivity's Benefits Be Shared: Nathaniel Goldfinger. AFL-CIO, American Federationist, June 1956 (pp. 14-15).

Distribution of the benefits of improved productivity among all groups in the population--through wage increases and lower prices, as well as greater profits.

8.013. How Should Labor Participate in Gains Through Technological Improvements. John W. Nickerson. Advanced Management, June 1952 (pp. 2-7).

A systematic method of action for labor and management to agree on how the fruits of progress should be shared.

8.014. How Should Productivity Increases Be Shared? Washington: AFL-CIO, Department of Education and Research, 1952 (8 pp.).

A trade union approach to wage adjustments based on increased productivity.

8.015. How to Raise Real Wages. New York: Committee for Economic Development, Research and Policy Committee, June 1950 (29 pp.).

National policy as it relates to the improvement of the standard of living. Suggestions to labor, management, and government on ways to stimulate further increases.

8.016. How to Split Productivity Gains with Labor, Owners and Consumers. Commercial and Financial Chronicle, August 23, 1956.

A method advocated by the First National Bank of Boston.

8.017. Increasing Labor Productivity. John D. Gill. New York: American Management Association, Production Policies for Increased Output, Production series No. 169, November 1946 (36 pp.).

The difficulties of making adjustments between wages, prices, production and profits which are necessary to maintain economic stability.

8.018. Industry's View on Productivity and Wages. New York: National Association of Manufacturers, April 1953 (4 pp.).

A study on whether it is in the natural interest or practicable to attempt tying wages to productivity.

8.019. The Interindustry Wage Structure and Productivity. Frederic Meyers and Roger L. Bowlby. Industrial and Labor Relations Review, October 1953, Vol. 7 (pp. 93-102).

The relationship between productivity and changes in the interindustry wage structure and a comparison with conclusion by other eminent authorities on the subject.

8.020. Labor and Management Look at Collective Bargaining. W. S. Woytinsky and Associates. New York: Twentieth Century Fund, 1949 (285 pp.).

Chapter 6 "Linking Wages to Prices or Productivity" contains various views on this relationship.

8.021. Labor Costs of Production. AFL-CIO, Education and Research Department, Economic Outlook, September 1953, Vol. XIV, No. 9 (pp. 67-68).

Labor's share of the profits realized from increasing productivity.

8.022. The "Labor Monopoly" Myth. AFL-CIO, Labor's Economic Review, February 1956, Vol. 1, No. 2 (24 pp.).

An analysis of economic factors that have made collective bargaining essential to the welfare of both the worker and the nation. Includes a production-wages-prices comparison, 1953-55.

8.023. Machinery and Equipment Prices and Wages. Machinery and Allied Products Institute Bulletin, No. 3216, December 20, 1954 (8 pp.); also Machinery Prices Versus Wage Rates, No. 3366, April 16, 1956 (4 pp.).

Both bulletins deal with the role of productivity in the price-wage relationship.

8.024. Meeting the Nation's Need for Steel. Arthur B. Homer, President, Bethlehem Steel Company. Address before the Investment Bankers Association, Hollywood, Florida, November 27, 1956 (16 pp.).

Productivity changes, and the relationship of wages and productivity in the steel industry.

8.025. NAM Can't See Productivity Pay. Business Week, February 21, 1953 (p. 176).

The National Association of Manufacturer's view on the reliability of productivity changes as a wage determinant.

8.026. The Nature of Productivity as a Wage Determinant and Issue of Collective Bargaining. Carl Frederic Erbe. Iowa City: State University of Iowa. (246 pp.).

Historical development of the term productivity, and an analysis of its measurement and its utilization in the wage structure.

8.027. A Note on "Productivity", Wage Increases. New York: Industrial Relations Counselors,.Inc., Industrial Relations Memo. No. 128, May 22, 1952 (8 pp.).

Summarizes the relevant provisions of the agreement between General Motors and the United Automobile Workers.

8.028. Price Rises Pull Up Labor Costs. AFL-CIO, Economic Policy Committee, Economic Trends and Outlook, June 1957 (1 p.).

Analysis of the Bureau of Labor Statistics report dealing with productivity, wages and salaries, costs and prices in the private nonfarm part of the national economy 1947-56.

8.029. Prices-Costs-Wages. A graphic analysis prepared for the 38th Annual Meeting of the Conference Board; National Industrial Conference Board, May 1954 (35 pp.).

Two sections of this report emphasize the importance of productivity studies. The section "Rewards of Greater Efficiency," stresses the general upward trend, and the section, "Two that Move as One," deals with unit labor cost as compared with output per man-hour from 1947-50.

8.030. Productivity A Big Labor Issue in 1954. Steel, August 17, 1953 (71 p.).

The necessity of granting a company's productivity-wage clause on its own experience rather than on the industry's or the general economy's productivity change.

8.031. Productivity and Progress. (Prepared for the Thirteenth Annual Meeting of the Conference Board, New York, May 16, 1946.) New York: National Industrial Conference Board, 1946 (36 pp.).

Productivity and "real" earnings; wages and prices; and standards of living from the early twenties to the nineteen forties.

8.032. Productivity and Real Wages. New York: Guaranty Trust Co., Guaranty Survey, April 1953 (pp. 1-4).

Defines productivity and discusses its relations to money and real wages.

8.033. Productivity and the Wage Structure. John T. Dunlop. Income, Employment and Public Policy; Essays in Honor of Alvin Hansen. New York: W. W. Norton & Company, Inc., 1948 (pp. 341-362).

The impact of changes in productivity on wage structure based on individual firm and industry experiences.

8.034. Productivity and the Worker. Developments in Labor Productivity Monthly Report, U. S. Department of Labor, Bureau of Labor Statistics, November 1954 (pp. 7-8). Prepared in cooperation with the Foreign Operations Administration. (now International Cooperation Administration).

Problems of wage-productivity alignment. Source: "Wage Productivity Comparisons," Jules Backman.

8.035. Productivity and Wage Control. Arthur M. Ross. Industrial and Labor Relations Review, January 1954, Vol. 7 (pp. 177-191).

The relationship between productivity changes and wages, and the problems involved in such an analysis.

8.036. Productivity and Wages. Seymour E. Harris and Associates. Review of Economics and Statistics, November 1949, Vol. 31, No. 4 (pp. 292-311).

The relationship between productivity and wages.

8.037. Productivity and Wages in Collective Bargaining. New York: National Industrial Conference Board, Inc., Management Record, August 1953 (pp. 281-285, 306-312).

A roundtable conference held at the 37th annual meeting of the National Industrial Conference Board.

8.038. Productivity and Wages in the United States. W. Duane Evans. W. S. Woytinsky and Associates. New York: Twentieth Century Fund, 1953 (pp. 63-81).

The general relationship between wages, prices and productivity.

8.039. Productivity as a Factor in Wage Determination. A Research Monograph. Austin M. Fisher and Fred Rudge. New York: Fisher, Rudge and Neblett, 1952 (96 pp.).

A detailed definition of "productivity," and an account of economic gains of employees over various periods as compared to productivity changes.

8.040. Productivity as a Standard for Wage Determination. R. E. Sibson. Labor Law Journal, March 1952, Vol. 3 (pp. 187-199).

Reasons for believing that the national productivity index cannot be a significant determinant of wages.

8.041. Productivity, Earnings, Costs and Prices in the Private Nonagricultural Sector of the Economy, 1947-56, (Rev.). U. S. Department of Labor, Bureau of Labor Statistics, May 29, 1957 (10 pp.).

Relationship of earnings, productivity and prices, noting certain statistical and conceptual limitations and qualifications.

8.042. Productivity Trends: Implications for Wage Policy. Management Record, June 1956 (pp. 203-205).

Insight into the validity of any figure on the nation's productivity for purposes of wage policy.

8.043. Productivity, Wage Rates, and Employment. Mordecai Ezekiel. American Economic Review, September 1940, Vol. 80 (pp. 507-522).

A review of Spurgeon Bell's book "Productivity, Wages and National Income" with the thought that it will stimulate theoreticians to a more incisive examination of this dynamic problem.

8.044. The Productivity--Wage Relationship. The Commercial and Financial Chronicle. April 2, 1953 (31 p.).

Why no one can say with authority whether real wages are low or high in relation to productivity.

8.045. Productivity, Wages and National Income. Spurgeon Bell. Washington: The Brookings Institution, 1940 (343 pp.).

Relationships between capital investment, productivity, employment, output, and level of wages for the period 1919-38 in the manufacturing, mining, railroad, and electric light and power industries with an analysis of the division of the gains resulting from increased productivity among labor, capital, and the general public.

8.046. Railroad Workers Win 4-Cent Hourly "Productivity" Increase. New York Times, March 19, 1953; The Railway Clerk, April 1, 1953 (3 p.).

Productivity's influence in this 4-cent hourly increase.

8.047. Relation of Wages to Productivity. New York: American Management Association, Advanced Management, Personnel Series, No. 122, 1948 (pp. 28-52).

A discussion by an economist, 2 industry and 2 union representatives.

8.048. Rewards of Increased Productivity. George G. Hagedorn. Economic Digest, January 1954, Vol. 7 (pp. 5-6).

Labor's share of profits realized from productivity increase.

8.049. Rigidity of Payrolls Held Threat to Continuation of Free Enterprise. Steel, November 11, 1946 (2 pp.).

The relationship between real wages and productivity.

8.050. Sharing the Gains of Technological Change. Clyde E. Dankert. Hanover: Dartmouth College, Amos Tuck School of Business Administration, 1955 (47 pp.).

Part 5, "The General Sharing of Technological Change," deals with arguments advanced in support of workers, employers, and consumers benefiting from them.

8.051. The Short-Run Behavior of Physical Productivity and Average Hourly Earnings. Clark Kerr. Berkeley: University of California, Institute of Industrial Relations. Reprint No. 18, 1950 (pp. 299-309). (Also Review of Economics and Statistics, Vol. 31, No. 4, November 1949.)

Some of the difficulties encountered in relating wage rates to changes in productivity.

8.052. The Significance of Current Trends in Prices, Wages, and Productivity. Ewan Clague. Paper presented before Chicago Chamber of Commerce and Chicago Chapter of American Statistical Association, Chicago, Illinois, January 9, 1947. U. S. Department of Labor, Bureau of Labor Statistics (11 pp.).

The Bureau of Labor Statistics' activities in the fields of price movements, wage rates and productivity.

8.053. The Significance of the 1948 General Motors Agreement. M. W. Reder. Cambridge: Harvard University, Review of Economics and Statistics, February 1949, Vol. XXXI (pp. 7-14).

The possible effects of the agreement on price levels, the wage structure, and full employment.

8.054. Technology in Our Economy. L. L. Lowin and J. M. Blair. Washington: U. S. Temporary National Economic Committee, 1941 (313 pp.). o. p.

Condenses references to technology in economic literature. Explores the relationship between laborsavings and price reduction by comparing productivity and prices for 9 industries.

8.055. A Theory of Interindustry Wage Structure Variation. Joseph W. Garbarino. The Quarterly Journal of Economics, May 1950 (pp. 282-305).

The relative incidence of productivity, the degree of industrial concentration and the extent of trade union organizations.

8.056. Trade Unions and Productivity. William H. Chartener. Washington: Editorial Research Reports, 1950, Vol. 1 No. 4 (pp. 63-79).

Productivity as a basis for wage determination.

8.057. Trends in Wage Rates and Productivity. P. H. Nystrom. Boston Chamber of Commerce Retail Trade Board, 22nd Annual Conference on Distribution, 1950 (pp. 48-56).

Recent inflationary trends have been caused chiefly by increases in wages and salaries at a faster pace than productivity. Eleven steps are proposed to stop inflation.

8.058. Tying Labor to Productivity. Charles R. Weidman. Labor Law Journal, April 1953 (pp. 285-286).

The phrases "increased worker productivity," and "improvement factor" should not be accepted at their face value.

8.059. Up. Output per Man-Unions Say: Raise Wages. U. S. News and World Report, April 23, 1954 (pp. 110-115).

Productivity is discussed as the key in union's argument for wage increases.

8.060. Value Productivity and the Interindustry Wage Structure. Richard Perlman. Industrial and Labor Relations Review, October 1956 (pp. 26-39).

Studies of the relationship between value productivity changes and the wage structure.

8.061. Wage Increases--Essential for Prosperity. AFL-CIO, Labor Economic Review, July-August 1956 (pp. 57-64).

Organized labor's view of the importance of wage and salary increases in improving living conditions and in contributing strength to the national economy.

8.062. Wage Policy in Our Expanding Economy. Washington: AFL-CIO, Department of Education and Research, 1952 (60 pp.).

An analysis of the Wage Stabilization Board's wage policy and the significance of rising productivity.

8.063. Wage - Productivity Comparisons. Jules Backman, Professor of Economics, New York University. Industrial and Labor Relations Review, October 1954, Vol. 8 (pp. 59-67).

The significance of various types of comparisons, in specific situations.

8.064. Wage - Productivity Comparisons. Grady L. Mullennix. Industrial and Labor Relations Review, July 1955, Vol. 8 (pp. 581-584).

Comment on "Wage - Productivity Comparisons" by Jules Backman, in Industrial and Labor Relations Review, October 1954, Vol. 8 (pp. 59-67). Mr. Backman replies July 1955 (pp. 585-589).

8.065. Wages and Future Economic Stability. Washington: AFL-CIO, February 1953 (5 pp.).

Compares productivity and wage increases.

8.066. Wages and Productivity. Jules Backman. Dun's Review and Modern Industry, January 1953 (pp. 23-24 and 72-80).

The relationship of production-payroll, for consideration by businessmen.

8.067. Wages and Productivity. John C. Davis and Thomas K. Hitch. Harvard University, Review of Economics and Statistics, November 1949, Vol. XXXI, No. 4 (pp. 292-298).

An examination of the theory that wages should move in relation to changes in productivity and a number of questions regarding the economic benefits expected if this relationship is maintained.

8.068. Wages Up or Prices Down. Solomon Barkin and Emerson P. Schmidt. Challenge Magazine, June 1953 (pp. 34-40).

Mr. Barkin for labor, and Mr. Schmidt for industry, State their views on whether our increasing productivity should lead to bigger pay checks or lower prices.

8.069. When Should Wages Be Increased? New York: National Industrial Conference Board, Studies in Business Economics, 1950, No. 23 (64 pp.).

The connection between productivity and wages, and the importance and the difficulty in assessing the value of this relationship.

8.070. Why Wages Rise: 2. Productivity. F. A. Harper. Freeman, April 1956 (pp. 36-39).

Relationship of changes in productivity and wage rates, 1910-55).

449922 O - 58 - 10

SECTION IX

PRODUCTIVITY AND LABOR MANAGEMENT RELATIONS

(Publications whose major emphasis is on productivity, wages and prices are listed in Section VIII).

9.001. AFL Attitudes Toward Production, 1900-32. Jean T. McKelvey. Cornell Studies in Industrial and Labor Relations, Ithaca: Cornell University Press, 1952, Vol. II (148 pp.).

A history of trade union attitudes toward production and progress to increase efficiency. Various productivity trends are thoroughly analyzed.

9.002. American Labor and the American Spirit. Witt Bowden. U. S. Department of Labor, Bureau of Labor Statistics, January 1954, Bull. No. 1145 (66 pp.).

A study designed to provide the members of productivity teams, visiting the United States under Government auspices, with background and insight into various aspects of our trade union movement and labor attitudes toward technological changes.

9.003. Can We Move Men? Peter F. Drucker. Steelways, April 1957 (pp. 16-18).

The challenge industrial managers face of making enlightened use of the human resources they have.

9.004. The Control of Industrial Labor in Communist China; and Development in Working Conditions in Communist China Since 1952. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1953 (p. 821); and April 1955 (p. 449) respectively.

Both articles deal with China's methods of increasing the productivity of factory and office workers without increasing the return for their labor.

9.005. French Measures Favoring Collective Bargaining. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, August 1955 (pp. 915-916).

One of two decrees issued by the French Government on May 1955 aimed toward the establishment of productivity-benefit-sharing programs.

9.006. Fundamentals of Getting Work Done Through Others. Frederick G. Rudge. Advanced Management, January 1953 (pp. 7-10).

The problem of personal relationship which management should consider in its effort to attain overall efficiency.

9.007. Greater Productivity from Modernization, from Expansion. E. A. Krauss. Magazine of Wall Street, May 6, 1950, Vol. 86 (pp. 133-135).

Outline the policies of management, labor, and government which will help to maintain productivity increases.

9.008. Greater Productivity through Labor-Management Cooperation. Ernest Dale. New York: American Management Association, 1949 (197 pp.).

Company and union experience in integrating labor and management in a common effort to increase productivity is analyzed on the basis of reports from 263 companies.

9.009. Incentives and Productivity Management's Attitude Toward Incentive System. Solomon Barkin. Industrial and Labour Relations Review, October 1951 (pp. 92-108).

The attitude of management to wage incentive systems.

9.010. Labor Management Cooperation. West P. Stotts, Martin E. Withrow, Ray Phillips. A Case Study in the Minneapolis Laundry Institute. Minneapolis: University of Minnesota, Industrial Relations Center, July 1946, Bull. 11 (20 pp.).

Three papers presenting the views of management, labor, and an engineer at a conference session called "The Laundry Looks to the Future Through Increased Productivity."

9.011. Labor-Management Cooperation for Increased Productivity. New York: American Management Association, 1948 Production Series No. 175 (48 pp.).

Merit rating instead of incentive in the job shop.

9.012. Labor's Responsibility for Full Productivity. Edward Cheyfitz. Modern Management, August 1947 (pp. 26-29).

Increasing productivity as a common interest for labor and management.

9.013. Management Problems of Worker Productivity. James P. Mitchell. Dun's Review and Modern Industry, August 1956 (pp. 46-47 and 88-91).

The contribution of productivity to industrial growth over the past fifty years, and the challenges management must be prepared to meet in the years ahead.

9.014. Management Techniques for Increasing Labor Productivity. New York: American Management Association, 1946, Production Series No. 163. (51 pp.).

Relationship of technological advances and labor productivity.

9.015. More Productivity from Engineers. C. D. Orth III. Harvard Business Review, March 1957 (pp. 54-62).

An analysis and concrete examples of administrative functions in the technical organization to realize a greater creative potential and efficiency in a group.

9.016. Problems of Labor Productivity in Wartime. W. Lund. The Annals of the American Academy of Political and Social Science, November 1942, Vol. 224 (pp. 110-116).

Labor's contribution to wartime productivity, suggestions by unions to increase output, and the role of labor-management committees.

9.017. Productivity--and Collective Bargaining. Benjamin M. Selekman and Sylvia K. Selekman. Harvard Business Review, March 1950, Vol. 28 (pp. 127-144).

Procedures in labor relations for overcoming obstacles to productivity indreases.

9.018. Productivity--and Labor Relations. Benjamin M. Selekman and Sylvia K. Selekman. Harvard Business Review, May 1949, Vol. 27 (pp. 373-391).

Current and past experiences in this field are presented as a guide to what lies ahead.

9.019. Productivity and the Trade Unions in France. Rene Richard. International Labor Review, September 1953, Vol. 68 (pp. 279-302).

A discussion of productivity questions within the trade union movement in France since the war and of experiments made in different industries by agreement between official productivity bodies and unions.

9.020. Review of Economics and Statistics. Cambridge: Harvard University Press, November 1949.

The entire issue is devoted to productivity and its impact on industrial relations.

9.021. Section Work in the Women's Garment Industry. Nathan Belfer. University of North Carolina, Southern Economic Journal, October 1954 (12 pp.).

Attitudes of trade unions toward innovations and new techniques in the division of labor.

9.022. Tightening Work Standards. Henry E. Wrape. Harvard Business Review, July 1952 (pp. 64-74).

Management problems that arise from a plantwide program of standards revision; the present deterioration of productivity standards and the effect of wage incentive plans.

9.023. Trade Union Attitudes and Their Effect Upon Productivity. Solomon Barkin. Industrial Relations Research Association, 1952 (20 pp.).

The impact of mass production on the traditional craft union attitudes toward technological change. Collective bargaining techniques developed by industrial unions to meet new conditions.

9.024. Trade Unions and Productivity. London: British Trade Unions Congress, 1950 (80 pp.).

Recommendations to the Congress by a team of British Trade Union Officials who visited the United States for six weeks beginning October 20, 1949, to investigate the role of unions in increasing productivity in the United States.

9.025. Union-Management Cooperation and Productivity. Robert Dubin. Cornell University, Industrial and Labor Relations Review, January 1949, Vol. 2, No. 2 (pp. 195-209).

An analysis of the basis for the existence of union-management cooperation to improve worker and technological efficiency.

9.026. Unionism and the Marginal Productivity Theory. Nathan Belfer and G. F. Bloom. Insights into Labor Issues, Richard A. Lester, Editor, New York: Macmillan Co., 1948 (pp. 238-266).

The effect of union rules and regulations upon the determination of wage-employment equilibria in the individual firm and an inquiry into the modifications that may be required in the marginal productivity theory to reconcile it with present-day developments in the labor market.

9.027. Wage Incentive Systems and Industrial Productivity. Solomon Barkin. Reprinted from the proceedings of the New York University Second Annual Conference on Labor, 1949 (25 pp.).

Effectiveness of wage incentive systems in promoting higher productivity and in sharing productivity gains with the worker.

SECTION X

BIBLIOGRAPHIES

10.001. Automatic Technology and Its Implications. A Selected Annotated Bibliography. Edgar Weinberg. U. S. Department of Labor, Bureau of Labor Statistics, August 1956, Bull. No. 1198 (78 pp.).

A bibliography of published materials concerning the progress of automatic technology and its social and economic effects.

10.002. Bibliography on Productivity. Paris: The European Productivity Agency of the Organisation for European Economic Co-Operation, April 1956, Project No. 233 (250 pp.).

A bibliography prepared by the National Centre of the French Association for the Increase of Productivity and the European Productivity Agency. Contains references to periodicals and books published anywhere in the world.

10.003. Digest of Material on Technological Changes, Productivity of Labor and Labor Displacement. U. S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, November 1932 (pp. 1031-1057).

Assembled by industry, the material on productivity and labor displacement previously published by Bureau of Labor Statistics either in bulletin form or in the Monthly Labor Review.

10.004. Have You Read? Brief Abstracts of Important Productivity Literature. Trade Union Information, January/February 1955, No. 1, (pp. 17-25).

A bimonthly publication of the Trade Union Research and Information Service, European Productivity Agency. It is devoted to reports on research and trade union progress or raising productivity in Europe.

10.005. Industrial Change and Employment Opportunity--A Selected Bibliography. Alexander Gourvitch and others. United States Works Progress Administration, National Research Project, July 1939, Report No. G-5 (254 pp.). o. p.

Bibliographical material accumulated during National Research Project studies.

10.006. List and Index of Interindustry Research Items and Miscellaneous Papers. Perry D. Teitelbaum. U. S. Department of the Interior, Bureau of Mines, Office of Chief Economist, Industry Miscellaneous Paper No. 100, November 2, 1954 (75 pp.).

10.007. Major Sources of Productivity Information. Allan D. Searle and Staff. U. S. Department of Labor, Bureau of Labor Statistics, June 1949 (48 pp.).

A review of contributions to productivity information made by public and private organizations engaged in research in the field of productivity.

10.008. Productivity: Its Measurement and Relationship With Wages. A Bibliography. Detroit: Automobile Manufacturers Association, September 1953 (70 pp.).

Collection of many "productivity" studies as well as the investigation of additional source material.

10.009. Select Bibliography on Productivity. Laszlo Rostas. London: London Board of Trade, 1952 (20 pp.).

Listings of selected books, pamphlets and articles on productivity published in the United Kingdom from 1948 to 1952.

10.010. Selected References on Productivity. U. S. Department of Labor, Bureau of Labor Statistics, October 1946 (48 pp.).

Bibliography listing principal works in the field of productivity measurement. Individual listings also appear in this 1957 publication.

10.011. Selected References on Productivity. Philadelphia: University of Pennsylvania, Wharton School of Finance and Commerce, March 14, 1947 (7 pp.).

Listings cover the years 1939-1946.

10.012. Selected References on Productivity Published in the United States. U. S. Department of Labor, Bureau of Labor Statistics, September 1946-September 1952. (Individual listings also appear in this 1957 publication.)

Extension of "Selected References on Productivity," October 1946.

10.013. Technological Advances and Skilled Manpower. U. S. Department of Health, Education, and Welfare, Division of Vocational Education, 1956, Misc. 3509 (67 pp.).

Annotated bibliography--implications for trade and industrial education.

SECTION XI

COLLEGE DOCTORAL DISSERTATIONS AND THESES

11.001. Agricultural Productivity and Economic Development in France, 1852-1950. Louis-Marie Goreux. Doctoral Dissertation, University of Chicago, 1955 (122 pp.).

11.002. American and Foreign Industrial Productivity; A Comparison and Evaluation. Arnold Oshin. M.P.A. Management Thesis, New York University, 1953.

11.003. An Analysis of the Productivity of Labor. Walter M. Carpenter. M.A. Labor and Industrial Management Thesis, State University of Iowa, 1952.

11.004. An Analysis of Wage Stabilization Board's Criteria in Wage Determination. William C. Ferguson. Doctoral Dissertation, State University of Iowa, June 1955 (184 pp.).

11.005. An Appraisal of Factors Affecting the Productivity of Employees in a Naval Ordance Plant. Charles J. Priest. M. S. Industrial Engineering Thesis, Purdue University, 1954 (218 pp.).

11.006. Case Study in Industry; Industrial Development--the Growth of the Pulp and Paper Industry in India. John C. Eddison. Doctoral Dissertation, Massachusetts Institute of Technology, 1954.

11.007. A Century and a Half of American Productivity. Irma P. Moses. A. M. Economics Thesis, Stanford University, 1953.

11.008. Collective Bargaining in Relation to Restriction of Work in the Rubber Industry. Frank Simonetti. Doctoral Dissertation, Indiana University, 1954 (254 pp.).

11.009. Comparison of Agricultural Labor Productivity in the United States and West Germany. Fritz H. J. Stanger. M. S. Agricultural Economics Thesis, Purdue University, 1954 (97 pp.).

11.010. Development and Testing of Methods of Measuring Productivity. Charles Z. Wilson. Doctoral dissertation, University of Illinois, 1956.

11.011. Development Criteria of Proficiency in Work Performance. Erwin Schoenfeld. M. A. Graduate School Thesis, New York University, 1953.

11.012. The Development of Modern Manufacturing Industry in China, 1928-1949. U. M. An-min Chung. Doctoral Dissertation, University of Pennsylvania, 1953.

11.013. Economic Trends in Woolen and Worsted Industry, 1899-1939. Robert W. Rosen. Doctoral Dissertation, University of Pittsburgh, 1955 (336 pp.).

11.014. Effects of Color Dynamics on the Efficiency of the Industrial Worker. Sydney J. Cohen. M.B.A. Business Administration Thesis, New York University, 1954.

11.015. Experimental Procedures and Criteria for Estimating Industrial Productivity. Adam Abruzzi. Doctoral Dissertation, Columbia University, 1950 (381 pp.).

11.016. A History of the Productivity Concept With a Concept on Associated Union Management Attitude. Norman S. Anon. Doctoral Dissertation, University of Wisconsin, 1954 (341 pp.).

11.017. Improving Labor Productivity in Bottling Fluid Milk. Gordon A. Rowe. Doctoral Dissertation, Purdue University, 1954 (105 pp.).

11.018. An Index for Rating Employee Productivity. Walter E. Langway. M.P.A. Graduate School of Public Administration and Social Service Thesis, New York University, 1953.

11.019. Labor Costs and Productivity in the Bituminous Coal Industry. Harold A. Borletta. M. A. Economics Thesis, Columbia University, 1953 (57 pp.).

11.020. Management Problems in Programs for Revising Productivity Standards Under Incentive Wage Plans. Henry E. Wrape. Doctoral Dissertation, Harvard University, 1952.

11.021. The Physical Conditions of the Work Environment and Their Effects Upon Production. Wilbur C. Rothgeber. M.B.A. Business Administration Thesis, New York University, 1954.

11.022. Productivity as an Issue in the Fall River- New Bedford Cotton and Rayon Textile Industry. Keith J. Norman. M. S. Industrial and Labor Relations Thesis, Cornell University, 1955 (163 pp.).

11.023. The Productivity of the Human Agent in Agriculture: An International Comparison. E. Thomson. Thesis, University of Chicago, 1951 (190 pp.).

11.024. A Quantitative Comparison of Certain Psychological Conditions Related to Group Productivity in Two Widely Different Industrial Situations. Nathan Maccoby. Thesis, University of Michigan, Microfilm, 1950.

11.025. Some Alternatives to the Marginal Productivity Theory as an Explanation of Firm Employment Level. James L. Green. Doctoral Dissertation, University of Minnesota, 1951.

11.026. Some Aspects of Productivity and the Balance of Payments. Sterie T. Beza. Doctoral Dissertation, Harvard University, 1954.

11.027. Some Economic Aspects of Adjustments to Technological Change. Martin Segal. Doctoral Dissertation, Harvard University, 1954.

11.028. A Statistical Evaluation of the Effects of Wage Incentives Upon Worker Productivity. Donald C. Demangate. M. S. Engineering Thesis, University of Southern California, 1954 (72 pp.).

11.029. The Stimulation of Creative Thinking in the Business Organization. Frederic D. Randall. M. S. Industrial Management Thesis, Massachusetts Institute of Technology, 1954.

11.030. A Study of Productivity and Its Measurement. Louis B. Kahn. Doctoral Dissertation, University of Wisconsin, 1951.

11.031. A Study of the Relationship Between Employee Attitudes and Productivity in a Group of Factory Workers. Martin W. Schaul. Doctoral Dissertation, Columbia University, 1953.

11.032. Use, Productivity and Allocation of Space Resources in Department Stores. William R. Davidson. Doctoral Dissertation, Ohio State University, 1952.

APPENDIX A

INDEX TO AUTHORS

449922 O - 58 - 11

APPENDIX B

INDEX TO TITLES

C--Continued

Title	Reference Number

P--Continued

Title	Reference Number

P--Continued

449922 O - 58 - 12

Title	Reference Number
P--Continued	
Productivity of Farm Labor, 1909 to 1938: Changes in Average Output	1.062
Productivity of Food Marketing Personnel	5.058
Productivity of Labor	5.059
Productivity of Labor, The: A Note on Terminology and Method	7.046
Productivity of Labour in British, American and German Agriculture.	3.069
Productivity of Labor in the Building of Concrete Roads in Illinois	1.087
Productivity of Labor in the Cement, Leather, Flour and Sugar Refining Industries, 1914 to 1925	1.106
Productivity of Labor in 11 Manufacturing Industries	1.107
Productivity of Labor in the Glass Industry	1.203
Productivity of Labor in Great Britain, The	3.068
Productivity of Labor in Loading and Discharging Ship Cargoes	1.309
Productivity of Labor in Merchant Blast Furnaces	1.220
Productivity of Labor in Newspaper Printing	1.153
Productivity of Labor in Peace and War	5.060
Productivity of Labor in Street and Road Building and in Ditch Digging	1.086
Productivity of Labor in the Cotton-Garment Industry	5.061
Productivity of Labor in the Cotton Industry.	5.070
Productivity of Labor in the Rubber Tire Manufacturing Industry	1.170
Productivity of Labor in the Sheet Department of the Iron and Steel Industry	1.221
Productivity of Railroad Labor	1.293
Productivity of Resources Used on Commercial Farms	1.063
Productivity of the Human Agent in Agriculture, The: An International Comparison	11.023
Productivity on the Increase	1.018
Productivity on the Upgrade	2.019
Productivity Ratio, The: Some Analytical Limitations on Its Use	4.072
Productivity Rise Ahead	7.047
Productivity Rush: Industry Boosts: Output Per Worker to Trim Labor Material Costs	5.063
Productivity Stands Still	5.064
Productivity Studies: Planning Guides for Industry	4.073
Productivity, Supervision and Employee Morale	5.066
Productivity, Supervision and Morale Among Railroad Workers	5.067
Productivity, Supervision and Morale in an Office Situation	5.068
Productivity Survey of English and French Manufacturing Plants.	3.072
Productivity -- The Hot New Issue	4.074
Productivity, the Key to National Security	5.069
Productivity, the Key to Prosperity	7.049
Productivity, Thrift and the Rate of Interest	7.050
Productivity Trends	7.051

APPENDIX C

NAMES AND ADDRESSES OF PERIODICALS CITED IN BIBLIOGRAPHY

Advanced Management
Society for the Advancement of Management, Inc.
74 Fifth Ave.
New York 11, N. Y.

Aero Digest
515 Madison Ave.
New York 22, N. Y.

AFL-CIO News
815 - 16th St., N. W.
Washington, D. C.

The American Economic Review
American Economics Association
Northwestern University
Evanston, Ill.

American Federationist
AFL-CIO Bldg.
815 - 16th St., N. W.
Washington 1, D. C.

American Journal of Sociology
University of Chicago Press
5750 Ellis Ave.
Chicago 37, Ill.

American Machinist
330 West 42d St.
New York 36, N. Y.

American Sociological Review
American Sociological Society
New York University
Washington Square
New York 3, N. Y.

The Atlantic
8 Arlington St.
Boston, Mass.

Automobile Manufacturers Association
366 Madison Ave.,
New York, N. Y.

Automotive and Aviation Industries
Chilton Company, Inc.
Chestnut & 56th Sts.
Philadelphia, Pa.

Blast Furnace and Steel Plant
Steel Publications, Inc.
330 Grant St.
Pittsburgh 30, Pa.

Boot and Shoe Recorder
Chilton Co., Inc.
Chestnut and 56th Sts.
Philadelphia, Pa.

Business Week
McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N. Y.

Canadian Journal of Economics and Political Science
273 Bloor Street, West
Toronto 5, Canada

Challenge Magazine
New York University
32 Broadway
New York 4, N. Y.

Chemical Engineering Progress
24 West 45th St.
New York, N. Y.

Chemical and Engineering News
American Chemical Society
1155 Sixteenth St., N. W.
Washington 6, D. C.

Coal Age
McGraw-Hill Publishing Co.
330 West 42d St.
New York, N. Y.

Commerce
Chicago Association of Commerce and Industry
1 North La Salle St.
Chicago 2, Ill.

Commercial and Financial Chronicle
William B. Dana Co.
25 Park Place
New York 7, N. Y.

Conference Board Business Record
National Industrial Conference Board
460 Park Ave.
New York 17, N. Y.

Dun's Review and Modern Industry
The Dun and Bradstreet Publications Corp.
99 Church St.
New York 8, N. Y.

Econometrica
Econometric Society
The University of Chicago
Chicago 37, Illinois

Economic Digest
Economic Research Council
18 South St.
London, W. 1.
England

Economic Journal
St. Martin's Press Co.
103 Park Ave.
New York 17, N. Y.

Economica
The London School of Economics and Political Science
Houghton Street
Aldwych, London, W. C. 2
England

Engineering and Mining Journal
National Press Bldg.
Washington, D. C.

Engineering News Record
McGraw-Hill Publishing Co.
330 West 42d St.
New York 36, N. Y.

Estadistica
Journal of Inter-American Statistical Institute
Pan American Union
Washington 6, D. C.

Factory Management & Maintenance
McGraw-Hill Publishing Co.
330 West 42d St.
New York 36, N. Y.

Federal Reserve Bulletin
Federal Reserve System
Washington 25, D. C.

Foreign Affairs
Council on Foreign Relations
58 East 68th St.
New York 21, N. Y.

Fortune
9 Rockefeller Plaza
New York 20, N. Y.

Freeman
Foundation of Economic Education, Inc.
Irvington-on-Hudson, N. Y.

Harper's Magazine
Harper & Brothers
49 East 33d St.
New York 16, N. Y.

Harvard Business Review
Harvard Business School Association
Soldiers Field
Boston 63, Mass.

APPENDIX C—Continued

Illinois Business Review
College of Commerce
University of Illinois
Urbana, Ill.

Impact of Science on Society
United Nations Organization
New York, N. Y.

Industrial & Engineering Chemistry
1155 Sixteenth St., N. W.
Washington 6, D. C.

Industrial and Labor Relations Review
New York State School of Industrial and Labor Relations
Cornell University
Ithaca, N. Y.

International Labour Review
Editorial Division Organization
Geneva, Switzerland

The International Shoe and Leather Weekly
Rumpf Publishing Co.
300 West Adams St.
Chicago, Ill.

Iowa Business Digest
The Iowa State College
Ames, Iowa

Iron Age
Chilton Co., Inc.
Chestnut & 56th Sts.
Philadelphia, Pa.

Journal of the American Statistical Association
1108 Sixteenth St., N. W.
Washington 6, D. C.

Journal of Applied Psychology
1333 Sixteenth St. N. W.
Washington 6, D. C.

Journal of Commerce
80 Varick St.
New York 13, N. Y.

Journal of Farm Economics
American Farm Economic Association
University of Illinois
Urbana, Ill.

Journal of the Institute of Personnel Management
Management House
Hill Street
London, W. 1, England

Journal of the Institute of Production Engineers
Production Engineering Management
Bramson Publishing Co.
2842 West Grand Boulevard
Detroit 2, Mich.

Journal of Marketing
American Marketing Association
1525 E. 53d St.
Chicago 15, Ill.

Journal of Personnel Administration and Industrial Relations
Personnel Research Publishers
P.O. Box 662, Benjamin Franklin Station
Washington, D. C.

Journal of Political Economy
The University of Chicago Press
5750 Ellis Avenue
Chicago 37, Ill.

Labor's Economic Review
American Federation of Labor and Congress of Industrial Organizations
AFL-CIO Building
Washington 6, D. C.

Labor Law Journal
Commercial Clearing House, Inc.
214 North Michigan Ave.
Chicago 1, Ill.

Leather and Shoes
The Rumpf Publishing Co.
300 West Adams St.
Chicago 6, Ill.

Magazine of Wall Street
90 Broad St.
New York, N. Y.

Management Record
National Industrial Conference Board
460 Park Ave.
New York 22, N. Y.

Management Review
American Management Association
330 West 42d St.
New York 4, N. Y.

Mechanical Engineering
The American Society of Mechanical Engineers
20th and Northampton Sts.
Easton, Pa.

Metal Finishing
381 Broadway
Westwood, N. J.

Mill and Factory
Conover-Nast Publishing Co., Inc.
205 East 42d St.
New York 17, N. Y.

Modern Castings
American Foundrymen's Society, Inc.
Golf & Wolf Roads
Des Plaines, Ill.

Modern Management
1231 - 24th St., N. W.
Washington, D. C.

Monthly Labor Review
U. S. Department of Labor
Bureau of Labor Statistics
Washington 25, D. C.

Monthly Review
Federal Reserve Bank of Kansas City
Kansas City 6, Mo.

Nation's Business
Chamber of Commerce of the United States
1615 H St. N. W.
Washington 6, D. C.

New England Letter
The First National Bank of Boston
Boston, Mass.

The New Republic
1826 Jefferson Place, N. W.
Washington 6, D. C.

New York Times
Times Building
229 West 43d St.
New York 36, N. Y.

Newsweek
Newsweek Building
Broadway and 42d St.
New York 36, N. Y.

Occupational Psychology
National Institute of Industrial Psychology
14 Welbeck St.
London, W. 1, England

Oil and Gas Journal
Albee Bldg.
1426 G. St., N. W.
Washington, D. C.

Paper Industry
Fritz Publishing Co., Inc.
431 Dearborn St.
Chicago 5, Ill.

APPENDIX C—Continued

Paper Trade Journal
15 West 47th St.
New York, N. Y.

Personnel Journal
Personnel Journal, Inc.
P. O. Box 239
Swarthmore, Pa.

Personnel Psychology, Inc.
Mount Royal and Guilfort Aves.
Baltimore 2, Md.

Political Science Quarterly
Columbia University
Fayerweather Hall
Columbia University
New York 27, N. Y.

Productivity Measurement Review
O. E. E. C. Mission
2000 P St. N. W.
Washington 6, D. C.

Purchasing
205 East 42d St.
New York 17, N. Y.

Quarterly Journal of Economics
Harvard University Press
44 Francis Avenue
Cambridge, Mass.

Reader's Digest
The Reader's Digest Association, Inc.
Pleasantville, N. Y.

Review of Economics and Statistics
Harvard Economic Press
Cambridge, Mass.

Science Monthly
American Association for the Advancement of Science
1515 Massachusetts Ave., N. W.
Washington 5, D. C.

Scientific American
Scientific American, Inc.
2 West 45th St.
New York 36, N. Y.

Social Science
National Social Science Honor Society
Pi Gamma Mu
Winfield, Kans.

The Statist
London, England

Steel
Penton Publishing Company
Penton Building
Cleveland 13, Ohio

Steelways Publication
150 East 42d St.
New York, N. Y.

Survey of Current Business
Office of Business Economics
U. S. Department of Commerce
Washington, D. C.

Textile Organon
10 East 40th St.
New York 16, N. Y.

Times Review of Industry
London, England

The Tool Engineer
400 Madison Avenue
New York, N. Y.

Trade Journal
American Paper and Pulp Association
122 East 42d St.
New York, N. Y.

U. S. News and World Report
30 Rockefeller Plaza
New York, N. Y.

United National Bulletin
United Nations Organization
New York, N. Y.

University of Illinois Bulletin
Urbana, Ill.

Vital Speeches of the Day
City News Publishing Company
33 West 42d St.
New York 36, N. Y.

Wall Street Journal
1015 - 14th St., N. W.
Washington, D. C.

The Washington Post and Times Herald
1515 L Street, N. W.
Washington 5, D. C.

APPENDIX D

NAMES AND ADDRESSES OF PUBLISHING ORGANIZATIONS CITED IN BIBLIOGRAPHY

Accounting Research Co.
520 - 5th Avenue
New York, N. Y.

Allen, George, & Urwin, Ltd.
London, England

American Federation of Labor and Congress of Industrial Organizations
815 Sixteenth St., N. W.
Washington 6, D. C.

American Iron and Steel Institute
250 Fifth Avenue
New York 1, N. Y.

American Management Association
330 West 42d St.
New York 36, N. Y.

American Statistical Association
1108 Sixteenth St., N. W.
Washington 6, D. C.

Dartmouth College
Amos Tuck School of Business Administration
Hanover, N. H.

Anglo-American Council of Productivity
U. S. Section
2 Park Ave.
New York, N. Y.

The Annals of the American Academy of Political and Social Science
3937 Chestnut St.
Philadelphia 4, Pa.

Boot and Shoe Workers' Union
246 Summer St.
Boston 10, Mass.

Boston Chamber of Commerce
Retail Trade Board
Boston, Mass.

British Board of Trade
H. M. Stationery Office
London, England

British Boot, Shoe, and Allied Trades Research Association
Satra House, Rockingham Road
Kettering, Northants
England

The Brookings Institution
722 Jackson St., N. W.
Washington 6, D. C.

Bulletin of Business Research
College of Commerce and Administration
The Ohio State University
Columbus, Ohio

Bureau of National Affairs, Inc.
1231 - 24th St., N. W.
Washington 7, D. C.

California Personnel Management Asso.
Farm Credit Building
2180 Milvia St.
Berkeley 4, Calif.

Chamber of Commerce of the United States
1615 H St., N. W.
Washington 6, D. C.

Chicago Association of Commerce and Industry
1 North La Salle St.
Chicago, Ill.

Chicago Council for Technological Advancement
120 North Michigan
Chicago, Ill.

Columbia University Press
427 West 117th St.
New York 27, N. Y.

Committee for Economic Development
Research and Policy Committee
444 Madison Avenue
New York 22, N. Y.

Conference on Economic Progress
1001 Connecticut Ave., N. W.
Washington 6, D. C.

Cornell University Press
Ithaca, N. Y.

Council for Technological Advancement
Ring Building
1200 - 18th Street
Washington 5, D. C.

Downs Printing Co,, Inc.
43 East 60th St.
New York, N. Y.

Econometric Institute, Inc.
230 Park Ave.
New York, N. Y.

Eddy-Rucker-Nickels Company
Harvard Square
Cambridge 38, Mass.

Edison, The Thomas, Foundation, Inc.
West Orange, N. J.

Editorial Research Report
1205 - 19th St., N. W.
Washington 6, D. C.

European Productivity Agency
Organization European Economic Co-operation
2002 P St., N. W.
Washington 6, D. C.

Federal Reserve Bank
Chicago Business Conditions
Box 834
Chicago 90, Ill.

First National City Bank of N. Y.
55 Wall St.
New York 5, N. Y.

Fisher, Rudge & Neblett, Inc.
New York & Los Angeles, Calif.
New York, N. Y.

Fordham University Press
302 Broadway
New York, N. Y.

Funk and Wagnalls Co.
155 East 24th St.
New York, N. Y.

George Washington University
The Graduate Council
2902 G St., N. W.
Washington, D. C.

Greenberg Publisher
201 East 57th St.
New York 22, N. Y.

Guaranty Trust Company of New York
Guaranty Survey
140 Broadway
New York 15, N. Y.

Harvard University Press
Cambridge, Mass.

APPENDIX D—Continued

Illinois Institute of Technology
3300 South Federal St.
Chicago, Ill.

Indiana University
Bloomington, Ind.

Industrial Health Research Board
H. M. Stationery Office
London, England

Industrial Materials Handling and Packaging Conference
Milwaukee, Wis.

Industrial Relations Counselors, Inc.
Rockefeller Center
1270 Avenue of the Americas
New York 20, N. Y.

Institute of Life Insurance
488 Madison Avenue
New York 22, N. Y.

Institute of Personnel Management
Management House
Hill St.
London, W. 1, England

Investment Bankers' Association
Hollywood, Fla.

Iowa State College
Ames, Iowa

International Cooperation Administration
Rochambeau Bldg.
815 Connecticut Ave., N. W.
Washington, D. C.

International Labour Offices
Geneva, Switzerland

Irwin, Richard D., Inc.
1818 Ridge Road
Homewood, Ill.

Johns Hopkins University
Homewood-Charles & 34th Sts.
Baltimore, Md.

Joint Committee on the Economic Report
Congress of the United States
Washington 25, D. C.

Kentucky Agricultural Experimental Station
Lexington, Ky.

Kings Crown Press
2960 Broadway
New York 27, N. Y.

Knopf, Alfred A., Inc.
501 Madison Ave.
New York 22, N. Y.

London Board of Trade
House Guards Ave.
Whitehall, London, S.W.1
England

McGraw-Hill Publishing Co., Inc.
330 West 42d St.
New York 36, N. Y.

Macmillan Co.
60 Fifth Avenue
New York, N. Y.

Machinery and Allied Products Institute
1200 Eighteenth St., N. W.
Washington, D. C.

Manchester Guardian Annual Survey of Industry
53 East 51st St.
New York, N. Y.

Massachusetts Institute of Technology
Cambridge, Mass.

National Association of Cost Accountants
505 Park Ave.
New York 22, N. Y.

National Association of Manufacturers
2 East 48th St.
New York 17, N. Y.

National Bureau of Economic Research, Inc.
261 Madison Ave.
New York 16, N. Y.

National City Bank of New York
55 Wall St.
New York, N. Y.

National Conference of Social Work Proceedings
345 East 46th St.
New York, N. Y.

National Industrial Conference Board, Inc.
460 Park Ave.
New York 17, N. Y.

National Planning Association
1606 New Hampshire Ave., N. W.
Washington, D. C.

National Research Council
2101 Constitution Ave., N. W.
Washington 25, D. C.

National Shoe Manufacturers Association, Inc.
342 Madison Ave.
New York 17, N. Y.

New York University Press
Washington Square
New York 3, N. Y.

The Newcomen Society of North America
RFD 2
West Chester, Pa.

Northwestern University
Evanston, Ill.

Norton, W. W., Co., Inc.
101 Fifth Avenue
New York 3, N. Y.

Ohio State University
Columbus, Ohio

Opinion Research Corporation
Princeton, N. J.

Oregon State College
Agriculture Experiment Station
Corvallis, Oreg.

Oxford University
Basil Blackwell & Mott, Ltd.
Broad St.
Oxford, England

Pack, The Charles Lathrop, Forestry Foundation
1214 - 16th St., N. W.
Washington, D. C.

Pitman Isaac
Pitman Publishing Corp.
2 West 45th St.
New York 36, N. Y.

Prentice-Hall, Inc.
70 Fifth Ave.
New York 11, N. Y.

Princeton University Press
Princeton, N. J.

APPENDIX D—Continued

The Public Affairs Institute
312 Pennsylvania Ave., S. E.
Washington, D. C.

Purdue University
Layfayette, Ind.

Raymond, Albert & Associates Inc.
Chrysler Building
New York 17, N. Y.

The Ronald Press
15 East 26th St.
New York 10, N. Y.

Row, Peterson and Company
1911 Ridge Ave.
Evanston, Ill.

Rutgers University
New Brunswick, N. J.

Rutledge and Kegan Paul, Ltd.
Broadway House
68-74 Carter Lane
London, England

Social Research
270 Park Avenue
New York, N. Y.

Southern Coal Producers Association
Southern Building
Washington, D. C.

Southern Economic Association
University of North Carolina
Chapel Hill, N. C.

Southern Illinois University
Lewis A. Maverick
Carbondale, Ill.

Stanford University Research Institute
Menlo Park
Stanford, Calif.

State University of Iowa
Iowa City, Iowa

The Statist
51 Cannon St., FC 4
London, E. C. 4
England

Textile Workers Union of America
99 University Place
New York 3, N. Y.

Trade Union Congress
Smith Square
London, S.W. 1., England

Twentieth Century Fund
330 West 42d St.
New York 36, N. Y.

U. S. Department of Agriculture
Washington 25, D. C.

U. S. Department of Commerce
Washington 25, D. C.

U. S. Department of Health, Education, and Welfare
Division of Vocational Education
Washington 25, D. C.

U. S. Department of the Interior
Bureau of Mines
Washington 25, D. C.

U. S. Department of Labor
Bureau of Labor Statistics
Washington 25, D. C.

U. S. Government Printing Office
Superintendent of Documents
Washington 25, D. C.

U. S. Social Security Board
Social Security Administration
Washington 25, D. C.

United Automobile Workers Union of America
C. I. O. - Research and Engineering Dept. Library
Solidarity House
Detroit, Mich.

United Nations Organization
Department of Economic Affairs
New York, N. Y.

United Steel Workers of America
1500 Commonwealth Bldg.
Pittsburgh 22, Pa.

University of California
Institute of Industrial Relations
Berkeley 4, Calif.

University of Chicago
5750 Ellis Ave.
Chicago 37, Ill.

University of Connecticut
Labor Management Institute
Storrs, Conn.

University of Illinois
Urbana, Ill.

University of Michigan
Bureau of Industrial Relations
Ann Arbor, Mich.

University of Minnesota
Minneapolis, Minn.

University of Montreal
Montreal, Canada

University of North Carolina
P. O. Box 1289
Chapel Hill, N. C.

University of Pennsylvania Press
Wharton School of Finance and Commerce
Philadelphia, Pa.

University of Pittsburgh Press
Institute of Business and Economic Problems
Pittsburgh, Pa.

University of Southern California
Los Angeles, Calif.

University of Wisconsin
Industrial Relations Center
Milwaukee, Wis.

The Viking Press, Inc.
18 East 48th St.
New York 17, N. Y.

Western Electric Co., Inc.
1111 North Capital St.
Washington, D. C.

Wiley, John & Sons, Inc.
440 Fourth Ave.
New York 16, N. Y.

Yale University Press
New Haven 7, Conn.

U. S. GOVERNMENT PRINTING OFFICE : 1958 O—449752