

THE  
ENCYCLOPEDIA  
OF  
MANAGEMENT

THIRD EDITION

*Edited by*  
CARL HEYEL

# THE ENCYCLOPEDIA OF MANAGEMENT

THIRD EDITION

*Edited by*

CARL HEYEL

*Management Counsel*



**VAN NOSTRAND REINHOLD COMPANY**

*New York Cincinnati Toronto London Melbourne*

Copyright © 1982 by Van Nostrand Reinhold Company

Library of Congress Catalog Card Number: 81-16467

ISBN: 0-442-25165-3

All rights reserved. Certain portions of this work copyright © 1973 and 1963 by Van Nostrand Reinhold Company. No part of this work covered by the copyright hereon may be reproduced or used in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems—without permission of the publisher.

Manufactured in the United States of America

Published by Van Nostrand Reinhold Company  
135 West 50th Street, New York, N.Y. 10020

Van Nostrand Reinhold Limited  
1410 Birchmount Road  
Scarborough, Ontario M1P 2E7, Canada

Van Nostrand Reinhold Australia Pty. Ltd.  
17 Queen Street  
Mitcham, Victoria 3132, Australia

Van Nostrand Reinhold Company Limited  
Molly Millars Lane  
Workingham, Berkshire, England

15 14 13 12 11 10 9 8 7 6 5 4 2 1

### **Library of Congress Cataloging in Publication Data**

Main entry under title:

The Encyclopedia of management.

Includes index.

1. Industrial management—Dictionaries.

I. Heyel, Carl, 1908-

HD30.15.E49 1981

658'.003'21

81-16467

# PREFACE

Continuing rapid advances in management concepts and techniques, and changes in the climate in which business, government, and institutional enterprises must operate, call for an updated and revised edition of THE ENCYCLOPEDIA OF MANAGEMENT.

Almost a decade has passed since the second edition of the work appeared. While the general thrust of the core subjects remains intact, and while the organization of the material and the format for indicating additional sources of information have withstood the test of time (the first edition appeared in 1963 and in a short time established itself as a standard reference work), it is obvious that recognition must be given to new developments and innovative approaches. In addition to rapid advances in information processing and communications technology, the intervening years have brought changes in legislation in the areas of labor relations, taxation, and mergers and acquisitions, enhanced social consciousness regarding environmental responsibilities and acceptable norms of business ethics, heightened awareness of consumer and employee rights, sharpened mathematical techniques, and new insights of the behavioral sciences into human motivations and group effectiveness.

Every one of the three-hundred-odd entries in the second edition has been carefully reviewed by the original author or, where he or she was not available, by someone of equal standing and competence. The hundreds of contributors—all of recognized authority in their fields—have provided easily referenced, to-the-point articles on modern business practice, of direct and immediate pertinency no matter what the reader's field of specialization.

All entries are arranged alphabetically from ACCOUNTING through ZERO DEFECTS, and are presented, as the complexity of the subject matter demands, from concise, half-page statements to more elaborate discussions ranging in size to as many as twenty-five or thirty pages. The reader is further directed to additional information sources, and the entries themselves are cross-referenced for complete coverage of any area of interest.

Entries carried over from the previous edition have, of course, been updated, and some were totally rewritten or drastically revised be-

cause of developments in the past decade. Important new entries in this edition are:

- ALTERNATE WORK SCHEDULES
- ASSESSMENT CENTERS
- BEHAVIOR MODELING IN TRAINING
- BUSINESS ETHICS
- BUSINESS-GOVERNMENT RELATIONS
- CONTROL THEORY: Application to Management
- COPYRIGHT
- CORPORATE STRATEGY AND BUSINESS POLICY
- DISASTER RECOVERY
- DISTRIBUTION PLANNING AND RESEARCH
- DYNAMIC PROGRAMMING
- EMPLOYEE PRIVACY
- ENGINEERING MANAGEMENT
- FIFO/LIFO INVENTORY ACCOUNTING
- FRANCHISING: Legal Aspects
- GOAL PROGRAMMING
- HUMAN RELATIONS IN INDUSTRY: An Overview
- INTEGER PROGRAMMING
- INTERNATIONAL MANAGEMENT: Management of the "World Enterprise"
- MANAGEMENT EDUCATION: Professional Certification
- MANAGEMENT PRACTICE: Learning from Foreign Management
- MANAGERIAL EFFECTIVENESS: Climate for Organizational Results
- MARKETING RESEARCH: Competitive Analysis
- NONLINEAR PROGRAMMING
- OCCUPATION SAFETY AND HEALTH ACT OF 1970
- OFFICE SAFETY
- ORGANIZATIONAL PLANNING: Q-Charts
- PACKAGING: Legal and Ethical Considerations
- QUALITY CONTROL CENTERS
- QUALITY OF WORKING LIFE
- ROBOTS IN INDUSTRY
- SECURITY: Protection of Trade Secrets and Proprietary Information
- TECHNOLOGICAL CHANGE: Union-Management Agreements
- TECHNOLOGICAL FORECASTING
- TERRORISM: Protective Measures
- TRADEMARKS: International Protection
- TRANSACTIONAL ANALYSIS IN MANAGEMENT

UNEMPLOYMENT INSURANCE  
UNIFORM COMMERCIAL CODE  
WOMEN IN MANAGEMENT  
ZERO-BASE BUDGETING

All entries, to the extent appropriate as dictated by subject matter, follow the editorial formula laid down for the first and second editions, namely: to tell the executive or management staff person not versed in a given specialty just what the subject is all about . . . what kinds of business or operating problems it helps solve . . . the kinds of specialists required

to put it to use in a given organization . . . the possibilities for the future as the subject undergoes further development . . . and sources of additional information.

For suggestions as to how to secure the maximum value from the wealth of authoritative information brought together in this single volume, the reader is referred to the section, immediately following the list of contributors, entitled "How to Use the Encyclopedia of Management."

CARL HEYEL, Management  
Counsel, Manhasset, New York

# CONTRIBUTORS

- ROBERT A. ABBOTT, Director, Technical Services, American Society for Quality Control, Milwaukee, Wisc. (Quality Control and Quality Assurance)
- LEE ADLER, President, Lee Adler & Company, New York, N.Y. (Marketing)
- ADMINISTRATIVE MANAGEMENT SOCIETY, Willow Grove, Pa. (Office Management and Administrative Services; Office Space Planning: The "Open Plan")
- WILLIAM M. AIKEN, President, H. B. Maynard and Company, Inc., Pittsburgh, Pa. (Incentive Systems)
- PETER S. ALBIN, Professor, Department of Economics, City University of New York, John Jay College, New York, N.Y. (Econometrics)
- JOE ALEXANDER, Consultant to Management, Apos, Calif. (Transactional Analysis in Management)
- AMERICAN BUSINESS PRESS, INC., New York, N.Y. (Advertising Media: Magazines)
- AMERICAN ASSOCIATION OF CERTIFIED PUBLIC ACCOUNTANTS, New York, N.Y. (Certified Public Accountant)
- AMERICAN NATIONAL STANDARDS INSTITUTE, New York, N.Y. (Industrial Standardization)
- AMERICAN SOCIETY FOR QUALITY CONTROL, Vendor-Vendee Technical Committee, Milwaukee, Wisc. (Vendor Rating)
- A. JAMES ANDREWS, Director of Publications, Association for Systems Management, Cleveland, Ohio (Organization Analysis and Planning; Systems Management)
- ANDERSON ASHBURN, Editor, *American Machinist*, New York, N.Y. (Automation)
- ASSOCIATION OF NATIONAL ADVERTISERS, INC., New York, N.Y. (Advertising Measured Results)
- AUERBACH PUBLISHERS, INC., Editorial Staff, Pennsauken, N.J. (Electronic Data Processing; Electronic Data Processing: Computer Peripherals; Electronic Data Processing: Equipment Classification)
- K. S. AXELSON, Executive Vice President, J. C. Penney Company, Inc., New York, N.Y. (Responsibility Reporting)
- LINDSAY L. BAIRD, Jr., Management Consultant, Mountain Lakes, N.J. (Security)
- JAMES J. BAMBRICK, Labor Economist, The Standard Oil Company (Ohio), Cleveland, Ohio (Labor Unions)
- BENNY BARAK, Ph.D., Assistant Professor of Marketing, Baruch College, City University of New York, New York, N.Y. (Sales Promotion)
- RALPH M. BARNES, Professor of Engineering and Production Management Emeritus, University of California at Los Angeles, Calif. (Motion and Time Study)
- COLIN BARRETT, Transportation Consultant, Reston, Va. (Freight Forwarders; Materials Management; Packaging, Protective: The Systems Approach; Physical Distribution Management; Traffic Management; Traffic and Transportation: Structure of the Transportation Industry; Warehousing)
- O. WILLIAM BATTALIA, Battalia and Associates, New York, N.Y. (Executive Recruitment; Executive Selection)
- CLIFFORD M. BAUMBACK, Professor of Production Management, University of Iowa, Iowa City, Ia. (Production Planning and Inventory Management—Concepts and Objectives)
- HRACH BEDROSIAN, Ph.D., Professor of Management and Organization Behavior, New York University, New York, N.Y. (Personnel Administration)
- MOSHE BEN-HORIM, Lecturer, School of Business, Hebrew University, Jerusalem, Israel, and Visiting Associate Professor, College of Business Administration, University of Florida, Gainesville, Fla. (Inflation)
- EUGENE J. BENGE, Management Consultant, Boca Raton, Fla. (Job Evaluation)
- L. J. BENNINGER, Ph.D., Professor Emeritus of Accounting, University of Florida, Gainesville, Fla. (Cost Accounting (Managerial Accounting); Cost Control; Flexible Budgeting; Standard Costing)
- MURRAY BERDICK, Ph.D., formerly Director of Applied Research, Chesebrough-Pond's, Inc., Trumbull, Conn. (Outside Research)
- B. J. BERKOWITZ, General Electric Company, Santa Barbara, Calif. (Game Theory)
- GEORGE BERKWITT, Editor, *Industrial Distribution* (Materials Handling: Equipment Types)
- BARRY BERMAN, Ph.D., Professor of Marketing, Hofstra University, Hempstead, N.Y. (Pricing Policy; Sales Statistics)

## xii CONTRIBUTORS

- GEORGE N. BIGGS III, President, American Society of Corporate Secretaries, Inc., New York, N.Y. (Corporate Secretary)
- SERGE A. BIRN, Chairman, The Birn Organization, GmbH., Frankfurt on Main, West Germany (Linear Responsibility Charting)
- LESTER R. BITTEL, formerly Editor, *Factory*, New York, N.Y. (Manufacturing Management)
- HORATIO BOND, Consulting Engineer, Hyannis Port Mass., formerly Chief Engineer, National Fire Protection Association, Boston, Mass. (Fire Loss Protection)
- LELAND P. BRADFORD, formerly Executive Director, National Training Laboratories (now NTL Institute), Arlington, Va. (Sensitivity Training)
- THOMAS A. BUDNE, Statistical Engineering Consultant, Great Neck, N.Y. (Reliability Engineering)
- FREDERIC E. BULLEIT, Vice President and Director, Materials Management, Armstrong Cork Company, Lancaster, Pa.; past International President, American Production & Inventory Control Society; past Chairman, Curricula and Certification Council, APICS (Production Planning and Inventory Management—Production Planning (Manufacturing Resources Planning))
- RUTH BURGER, Director of Human Resources Research, Research Institute of America, New York, N.Y. (Alcoholism and Drug Abuse in Industry)
- SAMUEL L. H. BURK, dec. formerly Vice President, Sherwood, Smith, and Associates, Inc., Philadelphia, Pa. (Job Evaluation)
- W. V. BURNELL, William V. Burnell & Associates, Boston, Mass. (Appraisal (of Property))
- PAUL W. BURTON, Director of Public Relations, Norden Systems, Inc., subsidiary of United Technologies Corporation, Norwalk, Conn. (Public Relations)
- WILLIAM E. CAMP, Management Consultant, Watertown, Pa. (Gantt Chart)
- JOHN CAPOZZOLA, Professor of Public Administration, New York University, New York, N.Y. (Public Administration)
- PETER J. CARROLL, Hayes/Hill Incorporated, New York, N.Y. (Marketing Strategy: Competitive Analysis)
- PHIL CARROLL, P.E., dec., Industrial Engineer, Maplewood, N.J. (Method Improvement; Overhead Assignment)
- THOMAS C. CATTRALL, Jr., Marketing and Refining Division, International Management Sciences Department, Mobil Oil Corporation, New York, N.Y. (Goal Programming; Linear Programming; Linear Programming: A Case Example; Mathematical Programming)
- F. R. CAWL, Jr., Publisher, *The Buyers Guide to Outdoor Advertising*, Searsport, Me. and New York, N.Y. (Advertising Media: Outdoor Advertising)
- YA-LUN CHOU, Ph.D., Department of Quantitative Analysis, St. John's University, New York, N.Y. (Business Forecasting)
- JESSE L. CLARK, Paperwork Systems, Newton, Mass. (Forms Design Instructions)
- LAWRENCE CONNELL, Administrator, National Credit Union Administration, Washington, D.C. (Credit Unions)
- DONALD W. CONOVER, Vice President (ret.) Man Factors, Inc., San Diego, Calif. (Human Engineering (Human Factors Engineering))
- A.V.C. COOK, Secretary, International Accounting Standards Committee, London, England (International Accounting Standards Committee)
- FREDERIC W. COOK, Frederic W. Cook & Co., Inc., New York, N.Y. (Venture Management)
- JOHN COUGHLAN, CPA., Partner, La France, Waker, Jackley, and Saville, Washington, D.C.; Adjunct Professor, Loyola College, Washington, D.C. (Return on Capital)
- RICHARD B. COUNTESS, Manager, International Training, Westinghouse Electric Corp., Power Generation Division, Philadelphia, Pa., and Adjunct Professor of Management, MBA School, Widener University Center, Chester, Pa. (New Product Development)
- ROBERT L. CRAIG, Vice President, Government and Public Affairs, American Society for Training and Development, Washington Office, Washington, D.C. (Human Resources Development)
- GRAEF S. CRYSTAL, Vice President, Towers, Perrin, Forster & Crosby, Inc., New York, N.Y. (Executive Compensation)
- SAMIR P. DAGHER, Ph.D., Chairman, Department of Business and Managerial Science, Marywood College, Scranton, Pa. (Business Ethics)
- ROBERT F. DELAY, President, Direct Mail/Marketing Association, New York, N.Y. (Advertising Media: Direct Response Marketing)



- GEORGE C. DEVOL, President, Devol Research Associates, Fort Lauderdale, Fla. (Robots in Industry)
- W. J. DICKSON, formerly Personnel Research, Western Electric Company, Inc., New York, N.Y. (Hawthorne Experiments; Personnel Counseling)
- J. WALTER DIETZ, dec., formerly President, Training Within Industry Foundation, Summit, N.J. (On-the-Job Training; Training Within Industry Program (TWI))
- DIRECTORY OF INTERNAL PUBLICATIONS, Chicago, Ill. (House Magazines)
- JOHN P. DORY, Professor of Management, Pace University, New York, N.Y. (Corporate Strategy and Business Policy)
- JEROME L. DREYER, Executive Vice President, Association of Data Processing Service Organizations, Arlington, Va. (Computer Service Industry)
- PETER F. DRUCKER, Clarke Professor of Social Sciences, Claremont Graduate School, Claremont, Calif. (Management Practice: Learning from Foreign Management)
- DANIEL J. DUFFY, Professor of Business Administration, Loyola College, Baltimore, Md. (Industrial Engineering; Work Measurement)
- DUN & BRADSTREET INC., New York, N.Y. (Credit Reporting)
- MARVIN D. DUNNETTE, Professor of Psychology, University of Minnesota, Minneapolis, Minn. (Personnel Testing)
- JULIUS E. EITINGTON, Director of Training and Research, BNA Communications Inc., Rockville, Md. (Personnel Management: Pioneers)
- ESTHER E. ESPENSHADE, Manager, Employment Security Research, Illinois Bureau of Employment Security, Chicago, Ill. (Unemployment: Concepts and Measurement; Unemployment Insurance; Women in Business and Industry; Women in Management)
- IRVIN B. ETTER, Director, Occupational Safety & Loss Control Consultant, National Safety Council, Chicago, Ill. (Safety and Health in the Workplace)
- JOEL R. EVANS, Ph.D., Chairman, Marketing and International Business Department, Hofstra University, Hempstead, N.Y. (Pricing Policy; Sales Statistics)
- DOROTHY FEY, Executive Director, The United States Trademark Association, New York, N.Y. (Trademarks)
- FINANCIAL EXECUTIVES INSTITUTE, New York, N.Y. (Controllershship; Treasurership)
- SEYMOUR H. FINE, Ph.D., Marketing Associates, Glen Rock, N.J. (Marketing Research: Sources of Information)
- STEVEN N. FISCHER, CPA, Adjunct Professor, Russell Sage College, Troy, N.Y.; Shareholder, Urbach, Kahn & Werlin, Albany, N.Y. (Taxation)
- THOMAS FORD, Attorney at Law, Benesch, Friedlander, Coplan, & Arnoff, Cleveland, Ohio (Antitrust Legislation)
- J. W. FORRESTER, Professor of Management, Massachusetts Institute of Technology, Cambridge, Mass. (Industrial Dynamics)
- WILLIAM A. FOWLER, Executive Director, National Home Study Council, Washington, D.C. (Correspondence Schools)
- WILLIAM M. FOX, Ph.D., Professor of Industrial Relations and Management, University of Florida, Gainesville, Fla. (Decision Making and Organizational Effectiveness; Scientific Management: "Taylorism")
- ROBERT F. FROEHLKE, President, American Council of Life Insurance, Washington, D.C. (Group Life Insurance)
- PAUL O. GADDIS, Dean, School of Management and Administration, The University of Texas at Dallas, Texas (Project Management)
- NEWELL GARFIELD, Jr., President, Newell Garfield Company, Inc., New York, N.Y. (Management by Objectives)
- LAURENCE N. GARTER, Partner, Touche Ross & Co., New York, N.Y. (Marketing: Patterns of Consumer Goods Distribution)
- CHARLES E. GEARING, Professor and Dean, College of Management, Georgia Institute of Technology, Atlanta, Ga. (Decision Theory)
- ARABINDA GHOSH, Ph.D., Associate Professor of Finance, Hofstra University, Hempstead, N.Y. (Corporate Capitalization; Economics)
- CHARLES P. GIEL, M.D., Medical Director, Joseph E. Seagram and Sons, Inc.; Associate Professor of Clinical Medicine, New York University College of Medicine; Associate Attending Physician, University and Bellevue Hospitals; New York, N.Y. (Occupational Health)
- JOHN J. GLASER, formerly Polaris Division, Sperry Gyroscope Co. Division of Sperry Rand Corp., Great Neck, L.I. (Critical Path Method; Integrated Project Management)
- ARNOLD GOLDENBERGER, Security Consultant, Great Neck, N.Y. (Security)
- WILLIAM M. GOLDSMITH, FIDSA, Goldsmith Yamasaki Sprecht, Inc., Chicago, Ill. (Industrial Design)



#### xiv CONTRIBUTORS

- ROBERT T. GOLEMBIEWSKI, Department of Political Science, University of Georgia, Athens, Ga. (Motivation)
- ROBERT D. GOODWIN, Executive Vice President, National Association of Credit Management, New York, N.Y. (Credit Management)
- C. E. GRAESE, CPA, Partner, Peat, Marwick, Mitchell & Co., New York, N.Y. (Statistical Accounting)
- CHARLES H. GRANGER, Hayes/Hill Incorporated, New York, N.Y. (Long-Range Corporate Planning)
- FRANK K. GRIESINGER, President, Frank K. Griesinger and Associates, Inc., Cleveland, Ohio (Leasing of Industrial Equipment)
- VINCENT F. GUERRIE, C.P.E., Chief Engineer, Johns-Manville World Headquarters, Denver, Colo. (Maintenance)
- DENISE R. GUILLET, *Administrative Management*, New York, N.Y. (Information Data Banks, On-Line)
- JOHN W. HAEFELE, Ph.D., formerly Research Scientist, Procter & Gamble Company, Cincinnati, Ohio (Brainstorming; Creativity)
- OLIVER S. HALLETT, Executive Secretary, National Association of Suggestion Systems, Chicago, Ill. (Suggestion Systems)
- ROBERT HAMPTON III, Partner, Price Waterhouse & Co., New York, N.Y. (International Accounting)
- FRED C. HART, President, Fred C. Hart Associates, Inc., New York, N.Y. (Environmental Controls)
- HARRY P. HATRY, Director, State and Local Government Research Program, The Urban Institute, Washington, D.C. (Cost-Benefit and Cost-Effectiveness Analysis)
- ROBERT G. HAWKINS, Vice Dean and Professor of Economics and Finance, New York University Graduate School of Business Administration, New York, N.Y. (International Management: Management of the "World Enterprise")
- HEIDRICK AND STRUGGLES, INC., Chicago, Ill. (Directors: Characteristics of Boards)
- J. L. HESKETT, 1907 Professor of Business Logistics, Harvard University Graduate School of Business Administration, Boston, Mass. (Business Logistics; Business Logistics: Case Example—Using the "Distribution Solution")
- CARL HEYEL, Management Counsel, Manhasset, N.Y. (Assessment Centers; Executive Development: Away-from-Company Programs; Executive Traits; Human Relations in Industry: An Overview; Industrial Research and Development; Management Movement: Leaders in Thought; Organization: Line-Staff Relationships; Scanlon Plan of Group Incentives; Standard Minute System; Supervisory Training; Technical Forecasting; Zero-Base Budgeting; Zero Defects)
- WILLIAM E. HILL, Hayes/Hill Incorporated, New York, N.Y. (Long-Range Corporate Planning)
- L. CLINTON HOCH, Executive Vice President, The Fantus Company, Millburn, N.J. (Industrial Districts; Plant Location)
- DR. HAROLD L. HODGKINSON, President, NTL Institute, Arlington, Va. (Sensitivity Training)
- DOROTHY HOGAN, Director of Communications, American National Standards Institute, Inc., New York, N.Y. (Standardization, Company)
- ROBERT N. HOGSETT, President, Hogsett Associates, Inc., Binghamton, N.Y. (Control Theory: Application to Management)
- DONALD J. HORTON, Attorney, Andrews, Kurth, Campbell & Jones, Houston, Tex. (Employment: Antidiscrimination Legislation)
- WINFIELD HUTTON, Hunter College of the City of New York, New York, N.Y. (Break-Even Analysis)
- INDUSTRIAL DISTRIBUTOR NEWS, Philadelphia, Pa. (Industrial Distributors)
- THE INSTITUTE OF INTERNAL AUDITORS, Altamonte Springs, Fla. (Internal Auditors)
- JOHN W. JOHNSON, Executive Vice President, American Collectors Association, Minneapolis, Minn. (Collection Services)
- ANDREW KALMYKOW, Consultant, American Insurance Association, New York, N.Y. (Workers' Compensation)
- DR. PETER KARES, Chairman of Finance, College of Business Administration, University of South Florida, Tampa, Fla. (Mergers and Acquisitions)
- JOSEPH KAUFMAN, Manager, Value Program, Cooper Industries, Inc., Houston, Tex. (Value Engineering (Value Analysis))
- W. E. KENDALL, Ph.D., Industrial Psychologist, Rye, N.Y. (Industrial Psychology; Personnel Testing: Types of Tests)
- JAMES H. KENNEDY, Editor and Publisher, *Consultants News*, Fitzwilliams, N.H. (Management Consulting)

- YUI KIMURA, MBA, University of Washington, Lecturer in International Management, New York University, New York, N.Y. International Management: Management of the "World Enterprise")
- WALTER A. KLEINSCHROD, editor of *Administrative Management* and editorial director of *Word Processing & Information Systems* magazine, New York, N.Y. (Office Automation)
- FRANK M. KNOX, Courier-Citizen Company, New York, N.Y. (Forms Control)
- RICHARD S. KRASHEVSKI, Department of Economic Research, AFL-CIO, Washington, D.C. (Guaranteed Annual Wage)
- H. E. KROLL, Dun & Bradstreet, Inc., New York, N.Y. (Financial Ratios)
- DONALD J. KULICK, Associate Regional Administrator, U.S. Department of Labor, Employment and Training Administration, New York, N.Y. (Training and Development (Government Sponsored))
- GEORGE H. KUPER, Associate, Production Resources Staff, General Electric Company, Bridgeport, Conn.; formerly Director, National Center for Productivity and Quality of Working Life. (Productivity: Concepts and Measures)
- STEPHEN LANDEKICH, Research Director, National Association of Accountants, New York, N.Y. (Accounting)
- THEOS A. LANGLEIE, Industrial Psychologist, Southbury, Conn. (Executive Appraisal: Diagnostic Performance Appraisal; Performance Appraisal (Merit Rating))
- DAVID C. LEAMAN, Director, Professional Development American Society for Quality Control, Milwaukee, Wisc. (Quality Control and Quality Assurance)
- JERRY LEATHAM, President, American Warehousemen's Association, Chicago, Ill. (Warehousing: The Public Warehouse)
- MAXWELL LEHMAN, Professor of Political Governmental Communications, Fairfield University, Fairfield, Conn.; formerly City Administrator, City of New York (Public Administration)
- WILL J. LESSARD, Chairman of the Board, American Institute of Management, Boston, Mass. (Management Audit)
- ROBERT E. LEWIS, Vice President, Citibank N.A., New York, N.Y. (Marketing Research: Patterns of Population Growth)
- WILLARD A. LEWIS, Ph.D., LL.B., Professor Emeritus of Management and Industrial Relations, Graduate School of Business Administration, New York University; Visiting Professor, Polytechnic Institute of New York, Brooklyn, N.Y. (Collective Bargaining; Labor Relations Legislation)
- PHILIP A. LINK, Production Control Manager, Automatic Electric Company, Northlake, Ill. (Production Planning and Inventory Management—Measurement of Effectiveness)
- DAVID F. LINOWES, Boeschstein Professor of Political Economy and Public Policy, University of Illinois at Urbana-Champaign, Ill. (Employee Privacy; Social Audit)
- IRA A. LIPMAN, Chairman of the Board and President, Guardmark, Inc., Memphis, Tenn. (Security: Protection of Trade Secrets and Proprietary Information)
- GORDON L. LIPPITT, Ph.D., Professor, School of Government and Business Administration, The George Washington University, Washington, D.C.; President, Organization Renewal, Inc., Washington, D.C. (Group Dynamics)
- ARTHUR D. LITTLE, Chairman of the Board, Narragansett Capital Corporation, Providence, R.I. (Venture Capital)
- EDWIN A. LOCKE, Ph.D., College of Business and Management and Department of Psychology, University of Maryland at College Park, Md. (Goal Setting)
- ANITA LOEBER, Consultant to Management on Organization, Systems, and Measurement, San Diego, Calif. (Management Societies and Associations; Supervisory Training; Work Measurement in the Office)
- DR. J. R. LONGSTREET, Professor of Finance, College of Business Administration, University of South Florida, Tampa, Fla. (Mergers and Acquisitions)
- J. KEITH LOUDEN, President, The Corporate Director, Inc., New York, N.Y. (Directors: Legal Duties and Responsibilities)
- ROBERT L. McCULLOUGH, Staff Writer, *Ohio Monitor*, monthly industrial safety publication of The Industrial Commission of Ohio, Division of Safety and Hygiene, Columbus, Ohio (Office Safety)
- WALTER B. MCFARLAND, Ph.D., formerly Director of Research, National Association of Cost Accountants, New York, N.Y. (Cash Flow Analysis; Direct Costing (Variable Costing); Industrial Research Accounting; Industrial Research Budgeting; Management Accounting)

## xvi CONTRIBUTORS

- E. PATRICK MCGUIRE, Project Director, Management Research, The Conference Board, New York, N.Y. (Franchising)
- MACHINERY AND ALLIED PRODUCTS INSTITUTE, Washington, D.C. (Fixed-Asset Investment Analysis: The MAPI Formulas and Procedures)
- MAGAZINE PUBLISHERS ASSOCIATION, New York, N.Y. (Advertising Media: Magazines)
- JOHN F. MAGEE, President, Arthur D. Little, Inc., Cambridge, Mass. (Operations Research in Marketing Decisions)
- BERNARD F. MAJOR, formerly Manager, Package Development Laboratory, Ortho Pharmaceutical Corporation, Raritan, N.J. (Packaging: Organizing for Package Development)
- RICHARD K. MANOFF, Chairman, Richard K. Manoff, Inc., New York, N.Y. (Advertising)
- JULIUS J. MANSON, Professor or Emeritus and former Dean, Bernard M. Baruch School of Business and Public Administration, City University of New York; formerly Executive Director, New York State Board of Mediation. (Mediation)
- HOWARD N. MANTEL, Director of Government Programs, Institute of Public Administration, New York, N.Y. (Public Authorities)
- LEONARD S. MATTHEWS, President, American Association of Advertising Agencies, New York, N.Y. (Advertising Agencies)
- H. B. MAYNARD, dec., formerly President, Maynard Research Council, Incorporated, Pittsburgh, Pa. (Materials Management: Material Handling Equipment Types; Operation Analysis; Process Analysis)
- JOHN F. MEE, Ph.D., LL.D., Mead Johnson Professor Emeritus of Management, Indiana University, Bloomington, Ind. (Management Movement; Matrix Organization; Scientific Management)
- BELDEN MENKUS, CPM., Management Consultant, Middletown, N.J. (Disaster Recovery; Forms Design; Records Management; Records Protection)
- BERT L. METZGER, President, Profit Sharing Research Foundation, Evanston, Ill. (Profit Sharing)
- DOROTHY J. MIAL, former Director, Education Division, National Training Laboratories (now NTL Institute), Arlington, Va. (Sensitivity Training)
- ROBERT W. MILLER, Director of Management Sciences, Raytheon Company, Lexington, Mass. (PERT (Program Evaluation and Review Technique))
- JAMES P. MITCHELL, Administrator, Bureau of Apprenticeship Training, U.S. Department of Labor, Employment, and Training Administration, Washington, D.C. (Apprenticeship Programs)
- ALFRED JAY MORAN, Jr., The TJM Corporation, New Orleans, La. (Forms Control)
- DR. STANLEY H. MULLIN, Vice President, University Alumni Relations, Pace University, New York, N.Y. (Public Relations Research)
- G. T. MUNDORFF, Rear Admiral, U.S. Navy, ret.; Assistant to the President, Information Systems Group, General Precision, Inc., Glendale, Calif. (Line of Balance: Line of Balance: Day Control)
- JOSEPH S. MURPHY, Vice President, ret., American Arbitration Association, New York, N.Y. (Labor Arbitration)
- H. W. NANCE, President, Serge A. Birn Company, Louisville, Ky. (Pre-determined Motion Times)
- BURT NANUS, Systems Development Corporation, Santa Monica, Calif. (Management Development Techniques)
- NATIONAL ASSOCIATION OF BROADCASTERS, Washington, D.C. (Advertising Media: Broadcasting)
- NATIONAL ASSOCIATION OF PERSONNEL CONSULTANTS, Washington, D.C. (Employment Agencies)
- NATIONAL CABLE TELEVISION ASSOCIATION, Washington, D.C. (Advertising Media: Cable TV)
- THOMAS A. NELSON, Manager, Office of Government Services, Price Waterhouse & Co., Washington, D.C. (Business-Government Relations)
- BENJAMIN J. NIEBEL, Professor Emeritus of Industrial Engineering, The Pennsylvania State University, University Park, Pa. (Process Engineering)
- NEWSPAPER ADVERTISING BUREAU, New York, N.Y. (Advertising Media: Newspapers)
- BLAKE T. NEWTON, President, American Council of Life Insurance, Washington, D.C. (Employee Benefit Plans)
- JOHN F. O'BRIEN, Assistant Regional Director, New York Regional Office, Federal Trade Commission, New York, N.Y. (Pricing: Legal Aspects)
- JOHN F. O'CONNOR, Editorial Director, *Purchasing*, Boston, Mass. (Purchasing)

- D. F. O'DONNELL, P.E., O'Donnell Sales & Engineering Company, Buffalo, N.Y. (Depreciation)
- GEORGE S. OLIVE, JR., Geo. S. Olive & Co., Indianapolis, Ind. (Certified Public Accountant: Role in Management Services)
- JOHN W. OLIVER, formerly Senior Vice President, The Linen Thread Company, Inc., New York, N.Y. (Taxation: Organization for)
- DAVID L. OLSSON, Ph.D., Professor, Department of Packaging Science, Rochester Institute of Technology, Rochester, N.Y. (Packaging: Legal and Ethical Aspects; Packaging: Organizing for Package Development)
- WILLIAM OLSTEN, Chairman and Chief Executive Officer, The Olsten Corporation, Westbury, L.I., N.Y. (Temporary Personnel Services)
- JOHN C. O'MARA, Executive Director, Computer Security Institute, Northboro, Mass. (Computer Security/Automated Office Security)
- EDWARD PATROSKI, Director of Investigations, Pinkerton's, Inc., New York, N.Y. (Terrorism: Protective Measures)
- JOHN R. PAULSEN, Ph.D., IBM Education, Lexington, Ky. (Behavior Modeling in Training)
- VITO F. PENNACCHIO, Coffin & Richardson, Boston, Mass. (Appraisal (of Property))
- STANLEY PETERFREUND, President, Stanley Peterfreund Associates, Inc., Closter, N.J. (Employee Attitude Research: Attitude Surveys)
- H. H. PETERSON, President, OSR, Inc., Honolulu, Hawaii (Waiting Line Theory (Queueing Theory))
- JOHN POLASTAK, Executive Director, Transit Advertising Association, New York, N.Y. (Advertising Media: Transit Advertising)
- SAUL POLIAK, President, Clapp & Poliak, Inc., New York, N.Y. (Trade Shows and Exhibits)
- J. T. POWERS, Peat, Marwick, Mitchell & Co., New York, N.Y. (Break-Even Analysis)
- KENNETH PURDY, Senior Associate, Roy W. Walters and Associates, Mahwah, N.J. (Job Enrichment and Work Effectiveness)
- HAROLD J. RAPHAEL, Ph.D., Director, Department of Packaging Science, Rochester Institute of Technology, Rochester, N.Y. (Packaging: Legal and Ethical Considerations)
- ERWIN RAUSCH, Didactic Systems, Inc., Cranford, N.J. (Management Games; Managerial Effectiveness: Climate for Organizational Results)
- NYLES V. REINFELD, Director, National Institute of Management, Inc., Bath, Ohio (Production Planning and Inventory Management—Inventory Control)
- RICHARD W. REYNOLDS, Senior Systems Analyst, Space Technology Laboratories, Redondo Beach, Calif. (Organization Analysis and Planning)
- MARKLEY ROBERTS, Economist, Department of Research, American Federation of Labor and Congress of Industrial Organizations, Washington, D.C. (Technological Change: Union-Management Agreements)
- SIMCHA RONEN, Ph.D., Associate Professor of Management and Organizational Behavior, Graduate School of Business Administration, New York University, New York, N.Y. (Alternative Work Schedules)
- HERBERT C. ROSENTHAL, President, Graphics Institute, Inc., New York, N.Y. (Annual Reports)
- DR. MICHAEL ROSOW, Director, The Productivity Forum, Work in America Institute, Scarsdale, N.Y. (Quality of Working Life)
- ALBERT H. RUBENSTEIN, Professor of Industrial Engineering and Management Sciences, Northwestern University, Evanston, Ill. (Organization Theory)
- RICHARD S. SABO, Manager, Educational Services, Lincoln Electric Company, Cleveland, Ohio (Lincoln Incentive Management Plan)
- KONRAD SADEK, World Vision International, Monrovia, Calif. (Human Resources Requirements Planning; Management Information Systems)
- SALES & MARKETING MANAGEMENT, New York, N.Y. (Industrial Purchasing Power: The S&MM Annual Survey)
- HENRY F. SANDER, Executive Director, American Production and Inventory Control Society, Inc., Washington, D.C. (Production Planning and Inventory Management—Introduction)
- ALBERT V. SANTORA, CMfgE., Vice President, Operations, Visual Graphics Corp., Tamarac, Fla. (Production Planning and Inventory Management—Production Control)
- RAYMOND SARCH, Senior Editor, *Data Communications*, New York, N.Y. (Data Communications)
- FRANCIS M. SCHAUER, Jr., Fellow, Society of

## xviii CONTRIBUTORS

- Actuaries; Actuary, The Wyatt Company, Washington, D.C. (Retirement Plans)
- MICHAEL SCHIFF, Ph.D., Professor of Accounting, Graduate School of Business Administration, New York University, New York, N.Y. (Marketing Cost Analysis)
- HOMER J. SCHNEIDER, Attorney, Leydig, Voit, Osann, Mayer & Holt, Ltd., Chicago, Ill. (Patents)
- JAMES SCHWEITZER, Xerox Corporation, Stamford, Conn. (Computer Security/Automated Office Security)
- R. C. SCOTT, Vice President, Eddy-Rucker-Nickels Company, Cambridge, Mass. (Rucker Plan of Group Incentives)
- ALLEN H. SEED II, Management Consultant, Arthur D. Little, Inc., Cambridge, Mass. (Inflation Accounting)
- BARNARD SELIGMAN, Graduate School of Business Administration, Pace University, New York, N.Y. (Money and Banking)
- EDWIN SHADE, Editor, *Geyer Dealer Topics*, New York, N.Y. (Information Storage and Retrieval (non-Computer))
- PHILIP W. SHAY, formerly Executive Vice President, Association of Consulting Management Engineers, Inc. (now ACME, The Association of Consulting Management Firms), New York, N.Y. (Innovation: The Management of Change)
- GORDON D. SHELLARD, formerly Associate Actuary, New York Life Insurance Company, New York, N.Y. (Operations Research)
- LEONARD J. SILVER, C.P.C.U., ARM, President, First Risk Management Company, Wincote, Pa. and First Risk Management (PR) Inc., San Juan, Puerto Rico (Insurance Management; Risk Management)
- DR. LEONARD C. SILVERN, President, Education and Training Consultants, Co., Sedona, Ariz., (Teaching Machines, Programmed Instruction, and Computer-Aided Instruction)
- JOHN D. SIMMONS, Financial Consultant, New York, N.Y. (Break-Even Analysis; Cost-Volume-Profit Analysis; Long-Range Corporate Planning; Long-Range Planning: Financial Aspects)
- GILBERT SIMONETTI, Jr., Partner, Office of Government Services, Price Waterhouse & Co., Washington, D.C. (Business-Government Relations)
- JOSEF P. SIREFMAN, Ph.D., J.D., Professor of Business Law, Hofstra University, Hempstead, N.Y. (Business Organization: Legal Structure; Directors: Legal Duties and Responsibilities)
- LAWRENCE SLOTE, Eng. Sc.D., P.E., New York University; Director, The Center for Safety, New York, N.Y. (Occupational Safety and Health Act of 1970)
- CHARLES W. SMITH, Consultant, Distribution by Design, Roslyn, N.Y. (Distribution Planning and Research)
- RICHARD D. SMITH, Manager-Public Affairs, Norden Systems, Norwalk, Conn. (Publicity)
- ALFRED SMOKE, Executive Director, New York Consumer Assembly, Inc., New York, N.Y. (Consumer Protection)
- PETER M. SPADER, Ph.D., Associate Professor of Philosophy, Marywood College, Scranton, Pa. (Business Ethics)
- JOHN L. SPAFFORD, President, Associated Credit Bureaus, Inc., Houston, Texas (Credit Bureaus)
- LEO SPECTOR, Editor, *Plant Engineering*, Barrington, Ill. (Plant Engineering)
- D. F. STANIC, Corporate Systems Manager, Alcan Aluminum Corporation, Cleveland, Ohio (Data Communications: A Case Example)
- DANIEL STARCH, Ph.D., Founder of Daniel Starch & Staff, Mamaroneck, N.Y. (Advertising Research)
- STARCH INRA HOOPER, INC., Mamaroneck, N.Y. (Advertising Research)
- JOEL M. STERN, President, Chase Financial Policy, The Chase Manhattan Bank N.A., New York, N.Y. (Financial Analysis: Earnings)
- WILLIAM D. STEVENS, Ph.D., Professor of Marketing, College of Business Administration, University of South Florida, Tampa, Fla. (Consumer Behavior Research; Marketing Research)
- MORRIS STONE, Vice President, ret., American Arbitration Association, New York, N.Y. (Arbitration)
- ROBERT W. TAFT, Senior Vice President, Hill and Knowlton, Inc., New York, N.Y. (Financial Public Relations)
- WILLIAM H. TANKERSLEY, President, Council of Better Bureaus, Inc., Washington, D.C. (Better Business Bureaus)
- JOHN PAUL TAYLOR, President, The John Paul Taylor Company, St. Joseph, Mich. (Manufacturers' Representatives)
- CRAIG S. TEDMON, Jr., Staff Executive, Power

- Systems Technology Operation, General Electric Company, Schenectady, N.Y. (Basic Research: Management Aspects)
- CLAYTON J. THOMAS, Assistant for Operations Research, ACS Studies and Analysis, Headquarters, U.S. Air Force, Washington, D.C. (Operational Gaming and Monte Carlo Simulation)
- JOHN M. THOMPSON, Vice President, Index Systems, Cambridge, Mass. (Computer Installations: Top Management Planning and Follow-Through)
- STEPHEN TINGHITELLA, Editorial Director, *Traffic Management*, New York, N.Y. (Shippers' Associations)
- ANTHONY R. TOCCO, Manager, Manufacturing Engineering, TRW Mission Mfg. Company, Houston, Tex. (Value Engineering (Value Analysis))
- EDWARD TOMESKI, Ph.D., Consultant and Professor of Management, Barry College, Miami, Fla. (Human Resources Requirements Planning; Management Information Systems)
- DR. DAVID VALINSKY, Professor of Statistics and Chairman, Department of Statistics and Computer Information Systems, Bernard M. Baruch College, City University of New York, New York, N.Y. (Statistics)
- PAUL WACHTEL, Professor of Economics, New York University Graduate School of Business Administration, New York, N.Y. and Visiting Professor, School of Business Administration, Hebrew University, Jerusalem, Israel (Inflation)
- WILLOUGHBY ANN WALSH, Executive Editor, *Word Processing & Information Systems*, New York, N.Y. (Word Processing)
- ROY W. WALTERS, President, Roy W. Walters and Associates, Inc., Mahwah, N.J. (Job Enrichment and Work Effectiveness)
- VERNON WEAVER, Administrator, Small Business Administration, Washington, D.C. (Small Business Administration)
- EDGAR WEINBERG, Consulting Economist, Bethesda, Md., formerly Assistant Director, National Center for Productivity and Quality of Working Life (Productivity: Concepts and Measures)
- ELI WERLIN, CPA, Professor and Chairman of Accounting, Russell Sage College, Troy, New York; Partner, Urbach, Kahn & Werlin, Certified Public Accountants, Albany, N.Y. (Taxation)
- HARRY R. WHITE, formerly Executive Director, Sales Executive Club of New York, New York, N.Y. (Sales Management; Sales Training)
- KENNETH W. WHITE, Vice President and General Manager, Health Insurance Institute, Washington, D.C. (Group Health Insurance)
- LAWRENCE S. WICK, Attorney, Leydig, Voit, Osann, Mayer & Holt, Ltd., Chicago, Ill; member representing franchising industry, State of Illinois Franchise Advisory Board (Copyright; Franchising; Legal Aspects; Trademarks; Trademarks: International Protection)
- C. WOODY WILLIAMS, Information Systems and Services Administration, Texas Instruments Incorporated, Dallas, Tex. (Management Information Systems: A Case Example)
- FRED E. WILLIAMS, Associate Professor and Chairman of Graduate Program, College of Management, Georgia Institute of Technology, Atlanta, Ga. (Decision Theory)
- MERRITT A. WILLIAMSON, Orrin Henry Ingram Distinguished Professor of Engineering Management, Vanderbilt University, Nashville, Tenn. (Engineering Management; New-Product Development)
- WESLEY E. WOODSON, President, Man Factors, Inc., San Diego, Calif. (Human Engineering (Human Factors Engineering))
- ED. YAGER, President, Consulting Associates, Inc., Novi, Mich. (Quality Control Circles)
- GORDON YATES, Vice President—Administration, McCormick & Co., Inc., Hunt Valley, Md. (Multiple Management)
- JACK YURKIEWICZ, Ph.D., The School of Business, Hofstra University, Hempstead, N.Y. (Dynamic Programming; Integer Programming; Nonlinear Programming)
- W. CLEMENTS ZINCK, dec., Industrial Engineer, formerly Vice President—Operations, Arbogast & Bastion, Inc., Allentown, Pa. (Work Simplification)

## HOW TO USE THE ENCYCLOPEDIA OF MANAGEMENT

The *ENCYCLOPEDIA OF MANAGEMENT* is more than an A to Z reference work, although it is that, of course. It is in addition presented as a *systematic reading course*—a “programmed” reading of entries in a planned sequence, in accordance with a prescribed subject listing. In essence, it is the “Great Books” idea in the field of management, between a single set of covers. It offers in one volume an authoritative treatment of the entire field.

The field is broad indeed, for management is the single discipline that has transformed the findings of all of the physical and social sciences into the towering achievements of our age. Without the genius and industry of the *manager*, the scientist and engineers would be mere dilettantes, engaging in intellectual pastimes with no necessary relation to the world of action.

### THE PROVINCE OF MANAGEMENT

Like the domain of the ancient philosophers, “all mankind” is management’s province. Management art and science must be brought to bear wherever effort must be organized on a significant scale—in government, the cultural arts, sports, the military, medicine, education, scientific research, and religion—as well as in the profit-making pursuits of manufacture and commerce.

Management takes appropriate advantage of technical developments in *all* of the fields it serves when it administers and controls any *one* of them. Small wonder, then, that if we have had “explosions” in the physical and social sciences, there must also have been an “explosion” in the discipline of management, which embraces all of them.

### THE DANGERS OF SPECIALIZATION

The result of any explosion is fragmentation. While this can be accepted as the price of advance in any discipline, resulting perforce in ever-increasing specialization in component parts, it presents a peculiar problem in a discipline whose very reason for being is the exact opposite—the resolution of the complexity and

diversity of many specialties into orderly patterns for planning and control. Here is the danger, then, that confronts management: the specialties with which it is concerned have proliferated to such an extent as to make it difficult for any single manager to know what management is all about. So rapid have the strides been in recent years in such subjects as mathematical techniques in decision-making, new insights of the behavioral sciences, integrated data processing and integrated information flow, and the like, to say nothing of proliferating legislative and governmental regulations, that heroic measures are required by the “older” executive (one who has been out of school all of fifteen years!) just to keep abreast. At the same time, continuing advances have been made in the traditional management subjects—accounting, production control, sales management, and the like—so that here, too, the alert executive needs a finger-tips reference source to update his or her concepts and skills.

The dilemma of management today is that in an age of specialists we face a growing dearth of generalists. The normal experience of a manager in business (at least in America) is to spend the formative years of his or her career in developing a great familiarity and proficiency in a relatively specialized field, such as a branch of engineering, or sales, production, procurement, personnel administration, or accounting. The manager thus develops only a peripheral knowledge of advances in other areas of management. Yet at the first promotion from a department-head or specialist type of position into one of truly administrative scope, the person with enlarged responsibilities suddenly finds that his or her horizon must extend beyond the four walls of a given specialty. It must now include more than only a superficial understanding of *all* aspects of managing—finance, purchasing, manufacturing, advertising and selling, industrial and public relations, research and development, and long-range planning. And the same is in a measure true in governmental and institutional administration as well as in private enterprise.

Moreover, as an executive attains succes-



sively higher rungs of management, he or she finds that many decisions of a far-flung enterprise must be made from the perspective of a broad liberal education which the demands of our technically oriented society may in many instances have precluded. Throughout the years spanned by the previous editions of this Encyclopedia, the cry has come from many quarters that top business leadership calls for more than the specialized training and narrow proficiencies of most of those who form the available pool of talent . . . that what is needed in addition is the grounding in history, literature, and philosophy that is the hallmark of the truly educated person.

#### A HELP TOWARD A SOLUTION

This Encyclopedia proposes to help solve at least the first half of the problem here stated. It does not presume to bridge the liberal-education gap. For information on philosophy, history, the arts, and letters, the reader must go elsewhere. But it *does* propose to bridge the other gap—to offer every executive, executive-aspirant, management consultant, and teacher and student of business administration, comprehensive and authoritative information on all arts, sciences, and techniques that impinge directly upon the executive job. It proposes to make the industrial research scientist aware of the thinking that goes on in top management, finance, and marketing; to make the salesman-manager understand the problems of production and finance; to make the financial executive knowledgeable about production and plant engineering; and to give the top manager or administrator who occupies the generalist position new insights into the work of the specialists whom he or she must manage or draw upon in the management of others.

In addition, the Encyclopedia proposes to make all such practitioners aware of the exploding advances in the newer management sciences—the tools of linear programming, game theory, applied probability theory—and in the behavioral sciences—motivation, group dynamics, human engineering, and the like. These disciplines touch upon all areas of specialization, because they concern the pervasive problems of decision-making and interpersonal relations.

#### REFERENCE, PLUS A PLANNED READING PROGRAM

The information herein is accessible in two forms: *First*, through the traditional A-Z com-

pilation for the quick answer to an immediate question or concise background information on any aspect of the whole broad field. *Second*, and of more lasting importance, as a planned reading program for pursuit in depth of any of twenty-eight “core subjects” in management—the reader’s own “Master’s program” in business administration. (This program is set forth in the “Guide to ‘Core Subject’ Reading” immediately following this foreword.)

The arrangement of the book as a whole on a strictly alphabetic basis, rather than by categories of subjects, makes for extremely rapid and convenient information retrieval. At the same time, cross-referencing makes it easy to pursue a major area of interest in whatever depth desired. Cross references to related entries are listed at the end of each article; in addition, a term or name appearing within the text that is also the title of a separate entry is set in capital and small-capital type. It is emphasized, however, that each subject is treated in essay form and “stands on its own feet,” so that the reader will obtain all essential information on a given subject without being continually shunted from one entry to another.

Every effort has been made to achieve comprehensiveness in choice and coverage of subject matter. The three-hundred-odd articles (i.e., exclusive of the biographical sketches) go far beyond mere definitions and referrals to other sources. They are in-depth treatments, giving background, subject branchings, “schools of thought,” current applications, and potentials. All major subjects are covered in the form of signed articles by recognized authorities.

While appropriate emphasis is given to advanced techniques and tools such as linear programming, game theory, electronic data processing, sensitivity training, management games, and automation, all traditional subjects with which modern executives must deal are included. On all of these the reader will be able to get a quick picture of the basics of the subject, what the important developments have been since, roughly World War II, and what directions future developments may be expected to take.

#### AUTHORITATIVENESS

Authoritativeness has been assured by the calibre of the individual contributors. In addition to the editor’s own contacts among those professionally engaged in the subjects treated,

which made possible original contributions by top-flight authorities, the work has benefited from the active cooperation of the leading professional societies active in the areas covered. For many subjects, these organizations either took on the responsibility of developing the entries, or secured authors from among their memberships. In the latter case, most of the entries were prepared not merely as signed, individual contributions, but as monographs carrying the imprimatur of the society. In many cases, the author of an entry is also the author of a recognized text on the subject, or editor of the leading trade magazine or professional journal in the field.

#### THE EDITORIAL FORMULA

The authors of all entries, especially those covering advanced techniques and new schools of thought, have to the extent feasible followed the editorial formula laid down, namely telling the executive not versed in the specialty just what the subject is all about . . . what kinds of management problems it helps solve . . . the kinds of specialists that are required to put it to use in a given organization . . . the degree of current acceptance . . . the possibilities for the future as the subject undergoes further development.

The editorial formula makes it possible to

assert that if the reader starts out completely innocent of any substantive knowledge of a subject, he or she will, after referring to this Encyclopedia, be in possession of the basics of the subject—objective, scope, mode of attack, potentials with respect to the reader's own business or government/institutional organization, sources of further information, and the like. Such a reader will then be in position to *ask the right kind of questions* of specialists and technicians in his or her own organization, to make sure that the firm or department (or government agency, or institution) is taking full advantage of the opportunity the subject presents.

#### FOR CONTINUING STUDY

A feature of the subject development, in addition to the core reading program, is the listing of Information References at the end of each entry. These give the names of the important professional associations and societies active in the subject under discussion, the journals specializing in the field, and the names of certain important texts and articles bearing on the subject. Thus the reader is given a start on continuing study should he or she so desire—the door is opened to further *live* information.

C.H.