

**McGRAW-HILL
CONCISE
ENCYCLOPEDIA
OF SCIENCE &
TECHNOLOGY**

Second Edition

GE

N61

11=2

McGRAW-HILL CONCISE ENCYCLOPEDIA OF SCIENCE & TECHNOLOGY

Second Edition

Sybil P. Parker

Editor in Chief

RBN36/01

McGRAW-HILL PUBLISHING COMPANY

New York St. Louis San Francisco

Auckland	Madrid	San Juan
Bogotá	Mexico	São Paulo
Caracas	Milan	Singapore
Hamburg	Montreal	Sydney
Lisbon	New Delhi	Tokyo
London	Oklahoma City	Toronto
	Paris	

014485

On the cover: The Great Nebula in Orion is a gas cloud excited to incandescence by hot stars in its center. The photograph was made with a 150-in. (3.8-m) telescope. (Copyright by Anglo-Australian Telescope Board, 1981)

Most of this material was extracted from the *McGraw-Hill Encyclopedia of Science & Technology*, Sixth Edition, copyright © 1987, and Fifth Edition, copyright © 1982 by McGraw-Hill, Inc. All rights reserved. Some material was also extracted from the following:

McGraw-Hill Encyclopedia of Electronics and Computers, copyright © 1984 by McGraw-Hill, Inc. All rights reserved.

McGraw-Hill Dictionary of Scientific and Technical Terms, Third Edition, copyright © 1984 by McGraw-Hill, Inc. All rights reserved.

McGraw-Hill Encyclopedia of Astronomy, copyright © 1983 by McGraw-Hill, Inc. All rights reserved.

Synopsis and Classification of Living Organisms, copyright © 1982 by McGraw-Hill, Inc. All rights reserved.

McGraw-Hill Encyclopedia of the Geological Sciences, copyright © 1978 by McGraw-Hill, Inc. All rights reserved.

McGRAW-HILL CONCISE ENCYCLOPEDIA OF SCIENCE & TECHNOLOGY, Second Edition, copyright © 1989, 1984 by McGraw-Hill, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

1234567890 DOW/DOW 8965432109

Library of Congress Cataloging in Publication Data

McGraw-Hill concise encyclopedia of science & technology / Sybil P. Parker, editor in chief. — 2nd ed.

p. cm.

Bibliography: p.

Includes index.

ISBN 0-07-045512-0

1. Science—Dictionaries. 2. Technology—Dictionaries.

I. Parker, Sybil P. II. Title: Concise encyclopedia of science & technology. III. Title: Concise encyclopedia of science and technology.

Q121.M29 1989

88-33275

503'.21—dc19

ISBN 0-07-045512-0

For more information about other McGraw-Hill materials, call 1-800-2-MCGRAW in the United States. In other countries, call your nearest McGraw-Hill office.

EDITORIAL STAFF

Sybil P. Parker, Editor in Chief

Arthur Biderman, Senior Editor

Jonathan Well, Editor

Betty Richman, Editor

Diane Kender Dittick, Editor

Patricia W. Albers, Editorial Administrator

Edward J. Fox, Art Director

Joe Faulk, Editing Manager

Frank Kotowski, Jr., Editing Supervisor

Thomas G. Kowalczyk, Production Manager

CONSULTING EDITORS

for the McGraw-Hill Encyclopedia of Science & Technology

Prof. George O. Abell. Deceased; formerly, Department of Astronomy, University of California, Los Angeles. ASTRONOMY.

Vincent M. Altamuro. President, Robotics Research, Division of VMA, Inc., Toms River, New Jersey. INDUSTRIAL ENGINEERING.

Dr. Paul M. Anderson. President, Power Math Associates, Inc., Del Mar, California. ELECTRICAL POWER ENGINEERING.

Eugene A. Avallone. Consulting Engineer; Professor Emeritus of Mechanical Engineering, The City College of the City University of New York. MECHANICAL ENGINEERING.

A. E. Bailey. Formerly, Superintendent of Electrical Science, National Physical Laboratory, London, England. ELECTRICITY AND ELECTROMAGNETISM.

Prof. T. M. Barkley. Division of Biology, Kansas State University. PLANT TAXONOMY.

Prof. B. Austin Barry. Civil Engineering Department, Manhattan College. CIVIL ENGINEERING.

Dr. Alexander Baumgarten. Director, Clinical Immunology Laboratory, Yale-New Haven Hospital. IMMUNOLOGY; VIROLOGY.

Dr. Walter Bock. Professor of Evolutionary Biology, Department of Biological Sciences, Columbia University. ANIMAL ANATOMY; ANIMAL SYSTEMATICS; VERTEBRATE ZOOLOGY.

Robert D. Biskman. Vice President—Engineering, Geostar Corporation, Washington, D.C. TELECOMMUNICATIONS.

Prof. D. Allan Bromley. Henry Ford II Professor and Director, A. W. Wright Nuclear Structure Laboratory, Yale University. ATOMIC, MOLECULAR, AND NUCLEAR PHYSICS.

W. S. Bromley. Consulting Forester and Association Consultant, New Rochelle, New York. FORESTRY.

Michael H. Bruno. Graphic Arts Consultant, Nashua, New Hampshire. GRAPHIC ARTS.

Prof. James N. Cameron. Port Aransas Marine Laboratory, Marine Science Institute, University of Texas, Austin. COMPARATIVE PHYSIOLOGY.

Dr. L. Leon Campbell. Provost and Vice President for Academic Affairs, University of Delaware. BACTERIOLOGY.

Dr. John F. Clark. Director, Space Application and Technology, RCA Laboratories, Princeton, New Jersey. SPACE TECHNOLOGY.

Dr. Richard B. Couch. Consulting Naval Architect, Ann Arbor, Michigan. NAVAL ARCHITECTURE AND MARINE ENGINEERING.

Prof. David L. Cowan. Department of Physics and Astronomy, University of Missouri. CLASSICAL MECHANICS AND HEAT.

Dr. Floyd L. Culler. President, Electric Power Research Institute, Palo Alto, California. NUCLEAR ENGINEERING.

Dr. C. Chapin Cutler. Ginzton Laboratory, Stanford University. RADIO COMMUNICATIONS.

Dr. P. Dayanandan. Division of Biological Sciences, University of Michigan. PLANT PHYSIOLOGY.

Dr. James Deese. Department of Psychology, University of Virginia. PHYSIOLOGICAL AND EXPERIMENTAL PSYCHOLOGY.

Sen H. Dodington. Avionics Division, ITT Corporation, Nutley, New Jersey. NAVIGATION.

Dr. Todd M. Doscher. Department of Petroleum Engineering, University of Southern California. PETROLEUM ENGINEERING.

Dr. H. Fernandez-Morales. N. Pritzker Divisional Professor of Biophysics, Division of Biological Sciences and the Pritzker School of Medicine, University of Chicago. BIOPHYSICS.

Prof. William F. Furter. Dean of Graduate Studies and Research, Royal Military College of Canada, Kingston, Ontario. CHEMICAL ENGINEERING.

Dr. John K. Galt. Senior Adviser, Aerospace Corporation, Los Angeles, California. PHYSICAL ELECTRONICS.

Prof. M. Charles Gilbert. Department of Geology, Texas A & M University. GEOLOGY (MINERALOGY AND PETROLOGY).

Prof. Roland H. Good, Jr. Department of Physics, Pennsylvania State University. THEORETICAL PHYSICS.

Dr. Alexander von Graevenitz. Department of Medical Microbiology, University of Zurich. MEDICAL BACTERIOLOGY.

Prof. David L. Grunes. Soil Scientist, U.S. Plant, Soil and Nutrition Laboratory, U.S. Department of Agriculture, Ithaca, New York. SOILS.

Dr. Carl Hammer. Research Consulting Services, Washington, D.C. COMPUTERS.

Melvin Hartmann. Director, Science and Technology, Lewis Research Center, National Aeronautics and Space Administration. AERONAUTICAL ENGINEERING, PROPULSION.

Dr. Dennis R. Heldman. Vice President, Process Research and Development, Campbell Institute for Research and Technology, Camden, New Jersey. FOOD ENGINEERING.

Dr. Ralph E. Hoffman. Associate Professor, Yale Psychiatric Institute, Yale University School of Medicine. PSYCHIATRY.

- Richard W. Hoppe.** Consulting Mining Engineer, Great Barrington, Massachusetts. MINING ENGINEERING.
- Dr. R. P. Hudson.** Bureau International des Poids et Mesures, Sevres, France. LOW-TEMPERATURE PHYSICS.
- Prof. Stephen F. Jacobs.** Professor of Optical Sciences, University of Arizona. ELECTROMAGNETIC RADIATION AND OPTICS.
- Prof. Richard C. Jarnagin.** Department of Chemistry, University of North Carolina, Chapel Hill. PHYSICAL CHEMISTRY.
- Dr. Donald L. Johnson.** Associate Professor, Department of Geography, University of Illinois, Urbana-Champaign. PHYSICAL GEOGRAPHY.
- Dr. Gary Judd.** Vice Provost, Academic Programs and Budget, and Dean of the Graduate School, Rensselaer Polytechnic Institute. METALLURGICAL ENGINEERING.
- Dr. Peter B. Kaufman.** Division of Biological Sciences, University of Michigan. PLANT PHYSIOLOGY.
- Prof. Edwin Kessler.** Retired; formerly, Director, National Severe Storms Laboratory, Norman, Oklahoma. METEOROLOGY AND CLIMATOLOGY.
- Prof. Robert C. King.** Department of Ecology and Evolutionary Biology, Northwestern University. GENETICS AND EVOLUTION.
- Dr. George deVries Klein.** Professor of Sedimentology, University of Illinois, Urbana-Champaign. GEOLOGY (PHYSICAL, HISTORICAL, AND SEDIMENTARY); PHYSICAL GEOGRAPHY.
- Prof. Richard G. Klein.** Department of Anthropology, University of Chicago. ANTHROPOLOGY AND ARCHEOLOGY.
- Prof. Irving M. Klotz.** Morrison Professor, Department of Chemistry, Northwestern University. BIOCHEMISTRY.
- Prof. R. B. Lindsay.** Deceased; formerly, Emeritus Professor of Physics, Physics Department, Brown University. ACOUSTICS.
- Dr. Carl N. McDaniel.** Associate Professor, Department of Biology, Rensselaer Polytechnic Institute. DEVELOPMENTAL BIOLOGY.
- Dr. Howard E. Moore.** Professor of Chemistry, Department of Physical Sciences, Florida International University. GEOCHEMISTRY.
- Dr. N. Karle Mottet.** Professor of Pathology, University of Washington School of Medicine. MEDICINE AND PATHOLOGY.
- Dr. Royce W. Murray.** Kenan Professor, Department of Chemistry, University of North Carolina, Chapel Hill. ANALYTICAL CHEMISTRY.
- Dr. William A. Nierenberg.** Director, Scripps Institute of Oceanography, University of California. San Diego. OCEANOGRAPHY.
- Prof. Jay M. Pasachoff.** Director, Hopkins Observatory, Williams College, Williamstown, Massachusetts. ASTRONOMY.
- Dr. William C. Peters.** Professor Emeritus Mining and Geological Engineering, University of Arizona. MINING ENGINEERING.
- Prof. David M. Prescott.** Department of Molecular, Cellular and Developmental Biology, University of Colorado. CYTOLOGY.
- Prof. William E. Ranz.** Department of Chemical Engineering and Materials Science, University of Minnesota. FLUID MECHANICS.
- Prof. D. A. Roberts.** Plant Pathology Department, Institute of Food and Agricultural Sciences, University of Florida. PLANT PATHOLOGY.
- Prof. W. D. Russell-Hunter.** Professor of Zoology, Department of Biology, Syracuse University. INVERTEBRATE ZOOLOGY.
- Brig. Gen. Peter C. Sandretto.** Deceased; formerly, Director, Engineering Management, International Telephone and Telegraph Corporation. NAVIGATION.
- Dr. Bradley T. Scheer.** Professor Emeritus, Biology, University of Oregon. GENERAL PHYSIOLOGY.
- Prof. Thomas J. M. Schopf.** Deceased; formerly, Department of the Geophysical Sciences, University of Chicago. PALEOBOTANY AND PALEONTOLOGY.
- Prof. William A. Steele.** Department of Chemistry, Pennsylvania State University. THERMODYNAMICS.
- Dr. M. Nafi Toksoz.** Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology. GEOPHYSICS.
- Dr. Anthony M. Trozzolo.** Charles L. Huisman Professor of Chemistry, University of Notre Dame. ORGANIC CHEMISTRY.
- Dr. David Turnbull.** Gordon McKay Professor of Applied Physics, Division of Applied Sciences, Harvard University. SOLID-STATE PHYSICS.
- Prof. Garret N. Vanderplaats.** Department of Mechanical and Environmental Engineering, University of California, Santa Barbara. DESIGN ENGINEERING.
- Prof. Richard G. Wiegart.** Department of Zoology, University of Georgia. ECOLOGY AND CONSERVATION.
- Dr. W. A. Williams.** Department of Agronomy and Range Science, University of California, Davis. AGRICULTURE.

PREFACE

For almost 30 years, in six editions, the *McGraw-Hill Encyclopedia of Science & Technology* (20 volumes) has been recognized as the leading international scientific encyclopedia. Authoritative, comprehensive, up to date, and eminently readable, that encyclopedia has served the continuing reference needs of professionals, students, librarians, technical writers and editors, and the general public. However, that reference provides so much detailed information on every aspect of science and engineering that it is too comprehensive for many readers' needs.

With this in mind, the editors conceived a shorter version of the multivolume work which would retain the authoritativeness, accuracy, clarity, recency, quality, and coverage in a convenient, concise format. The result is the *McGraw-Hill Concise Encyclopedia of Science & Technology*—much more than a dictionary yet less than the 20-volume set.

In preparing the *Concise Encyclopedia of Science & Technology*, the editors extracted the essential text from each article in the parent work while retaining the same proportionality between subjects. The length of each article suits the importance and complexity of the subject. The material has been condensed so that it is appropriate to the likely requirements of a one-volume reader. The editorial philosophy emphasized pertinence and succinctness, and avoidance of detail suitable only for a multivolume format. All articles retain the identity of the original authors, all internationally recognized experts, whose affiliations are included in a complete alphabetical listing.

There are 7700 alphabetically arranged text entries. Virtually every entry includes cross-references to other articles to guide the reader to related subjects. Many of the articles are illustrated with photographs, maps, graphs, diagrams, and drawings. A second color is used for most drawings in the volume to enhance comprehension. Dual measurement units (U.S. Customary and International System) are used throughout the text to meet all users' needs.

The special features of this reference are three separate sections at the back of the volume. First, for the convenience of users seeking material for further study, is the "Bibliographies and Data Bases" section. The Bibliographies list hundreds of books and journals alphabetically by subject area. The other subsection is an alphabetical listing of 81 data bases available worldwide and representing "today's" research tool. Second is the 49-page Appendix which gathers together information on units of measurement, mathematical notation, chemical elements, electronic circuits, elementary particles, as well as animal and plant taxonomy. Finally, the 30,000-entry Index provides the reader with instant access to the specific information in the text.

This reference was created to meet the need for current, accurate information on classical and "newsworthy" concepts in science and engineering in a practical, economical format. It is a starting point for anyone with a serious interest in the sciences, and even for scientists and other professionals looking for information on subjects outside their speciality. As such, the *McGraw-Hill Concise Encyclopedia of Science & Technology* will be an invaluable addition to the reference shelf of any library.

Sybil P. Parker
Editor in Chief

ORGANIZATION OF THE ENCYCLOPEDIA

Alphabetization. The 7700 article titles are sequenced on a word-by-word basis, not letter by letter. Hyphenated words are treated as separate words. In occasional inverted article titles, the comma provides a full stop. The Index is alphabetized on the same principles. Readers can turn directly into the pages for much of their research. An example of sequencing is:

Air	Air pressure
Air brake	Air-traffic control
Air-cushion vehicle	Airborne radar
Air pollution	Aircraft
Air-pollution control	Aistopoda

Cross-References. Virtually every article has one or more cross-references set in CAPITALS AND SMALL CAPITALS. These references offer the user the option of turning to other articles in the volume for related information.

Measurement units. Since some readers prefer the U.S. Customary system while others require the International System of Units (SI), most measurements in the Encyclopedia are given in dual units. Insight into the measurement systems is provided by the discussion in the Appendix, which also has handy conversion tables.

Contributors. The authorship of each article is specified at its conclusion, in the form of the contributor's initials for brevity. The contributor's full name and affiliation may be found in the "Contributors" section at the front of the volume.

Bibliographies and Data Bases. Users wishing to go beyond the scope of this Encyclopedia will find recommended books and journals listed at the back of the volume. The titles are grouped by subject area. For readers with advanced research facilities, the Data Bases listing provides the name of the data base, a description of its contents, and the names of the producer and distributor.

Appendix. Every user should explore the variety of succinct information supplied by the Appendix, which includes measurement tables, mathematical notation, electronic symbols, a detailed periodic table, abbreviations, taxonomic classification, and a biographical listing of scientists.

Index. The 30,000-entry Index offers the reader the time-saving convenience of being able to turn quickly to the highly particular in the pages, rather than approaching the Encyclopedia via article titles only. This elaborate breakdown of the volume's contents assures both the general reader and the professional of efficient use of the *McGraw-Hill Concise Encyclopedia of Science & Technology*.

CONTRIBUTORS

Each article in the Encyclopedia is signed with the contributor's initials; coauthors' initials are separated by semicolons; initials of an original author are separated by a solidus from the initials of a validator who may have modified the text in a later printing. The section below, Contributors' Initials, gives all such initials, alphabetized according to the capital letters in each initials combination (lowercase letters have been added to differentiate contributors with like initials). The contributor's name is provided. The contributor's affiliation can then be found by turning to the following section, List of Contributors.

CONTRIBUTORS' INITIALS

A

A.A.B.	A. A. Bergh	A.E.C.	A. E. Cameron	A.H.So.	Alfred H. Sommer
A.A.B.P.	A. Alan B. Pritsker	A.E.DeM.	Augustus E. de Maggio	A.H.St.	Alfred H. Sturtevant
A.A.G.	Albert A. Gunkler	A.E.F.	A. E. Fiore	A.H.Su.	Arthur H. Sully
A.A.McK.	Alexander A. McKenzie	A.E.Fr.	A. E. Freeman	A.H.T.	Alan H. Tuttle
A.A.W.	Arthur A. Welch	A.E.G.	Arnold E. Greenberg	A.H.W.	Alfred H. Wolferz
A.B.	Alexander Batmgarten	A.E.J.	Amos E. Joel, Jr.	A.I.	Alexander Illis
A.Ba.	Arthur Bank	A.E.J.E.	A. E. J. Engel	A.J.C.	Alan J. Charig
A.Bi.	Arthur Bienenstock	A.E.M.	A. E. Martell	A.J.Co.	Almon J. Corson
A.Br.	A. Brynjolfsson	A.E.Mo.	Alice E. Moore	A.J.D.	Adrianus J. Dekker
A.Bre.	Alan Breier	A.E.S.	A. E. Siegman	A.J.F.	A. John Ferguson
A.Bu.	Allison Butts	A.E.T.	Anthony E. Tancreto	A.J.G.	A. J. Grobecker
A.B.C.	Ali B. Cambel	A.E.Ta.	Angus E. Taylor	A.J.H.	Armin J. Hill
A.B.G.	Alfred B. Garrett	A.E.V.D.	Albert E. Von Doenhoff	A.J.He.	Alan J. Heeger
A.B.Gu.	Ashley B. Gurney	A.E.W.	Albert E. Vackerman	A.J.Ho.	Alan J. Hoffman
A.B.M.	Alton B. Moody	A.E.Wo.	Albert E. Wood	A.J.Hu.	A. J. Hundhausen
A.B.McG.	Ann B. McGuire	A.F.	A. Fiscarelli	A.J.R.	A. J. Rowell
A.C.	Alice Chénault	A.Fl.	Abraham Fleminger	A.J.T.	Aaron J. Teller
A.Ci.	Alex Ciegler	A.F.B.	A. F. Banfield	A.K.	Arthur Kelman
A.Co.	Aaron Cohen	A.F.H.	A. F. Hagner	A.K.M.	Alfred K. Mann
A.Cou.	Arnold Court	A.F.M.	Albert F. Martin	A.L.	Anton Lang
A.Cr.	Arthur Cronquist	A.F.N.	Arthur F. Niemoeller	A.La.	Alan Lawley
A.C.B.	A. Clarke Beller	A.F.P.	Albert F. Puchstein	A.Lo.	Alan Longacre
A.C.C.	Andrew C. Campbell	A.F.R.	Austen F. Riggs	A.L.A.	Albert Louis Alfred
A.C.Ca.	A. Charles Catania	A.G.	Anne Geller	A.L.B.	Aaron L. Brody
A.C.Cl.	Anthony C. Clement	A.Gh.	Albert Ghiorso	A.L.deW.	A. L. de Weck
A.C.D.	A. C. Dickleson	A.G.C.	Albert G. Conrad	A.L.G.	Arnold L. Gordon
A.C.G.	Arch C. Gerlach	A.G.H.	Arthur G. Hansen	A.L.H.	Allen L. Hanson
A.C.Gi.	Arthur C. Giese	A.G.He.	Angus G. Hepburn	A.L.K.	Arthur L. Kohl
A.C.N.	A. Conrad Neumann	A.G.Ho.	Albert G. Holzman	A.L.M.	A. L. Myers
A.D.	Albert Damon	A.G.Hu.	Arthur G. Humes	A.L.O.	Ada L. Olins
A.Do.	Ali Dogramaci	A.G.L.	Allan G. Lochhead	A.L.P.	A. L. Ponikvar
A.D.A.	Aaron D. Alexander	A.G.McN.	Alvin G. McNish	A.L.S.	Arthur L. Schawlow
A.D.C.	Arthur D. Code	A.G.S.	Arthur G. Steinberg	A.L.Sh.	Alex L. Shigo
A.D.H.	Arthur D. Hasler	A.G.W.C.	A. G. W. Cameron	A.M.	Alfred Makulec
A.D.M.	Andrew D. Miall	A.H.	Arthur Haut	A.Mo.	Albert Moscovitz
A.D.P.	Allan D. Pierce	A.He.	Alexander Hellemans	A.M.C.	Arthur M. Chickering
A.E.	Arne Engstrom	A.H.B.	Alan H. Brush	A.M.D.A.	Amelio M. D'Arcangelo
A.Er.	A. Erdélyi	A.H.G.	Arthur H. Graves	A.M.G.	Alan M. Gaines
A.Erd.	Arthur Erdman	A.H.J.	Aldon H. Jensen	A.M.H.	A. M. Hartley
A.E.B.	Alex E. Brodhay, Jr.	A.H.K.	Alan H. Karp	A.M.I.	Aly M. Ibrahim
A.E.Ba.	A. Earle Bailey	A.H.M.	Anne H. Morgan	A.Mcl.	Andrew McIntyre
A.E.Br.	Arthur E. Bryson, Jr.	A.H.R.	Arastin H. Riesen	A.M.M.	Alexander M. Mood
		A.H.Ro.	Arthur H. Robinson	A.M.Ma.	Abe M. Macher
		A.H.S.	Amelie H. Scheltema	A.M.P.	Arthur M. Perrin
		A.H.Sn.	Arthur H. Snell	A.M.Pl.	Allison M. Platt

A.M.W. Andre M. Weitzenhoffer
 A.N. Allen Newell
 A.No. Aaron Novick
 A.N.C. Archie N. Carter
 A.N.Co. Arthur N. Cox
 A.N.L. Arnold N. Lowan
 A.N.S. Albert N. Sayre
 A.O.N. Alfred O. Nier
 A.P. Allen Pearson
 A.Pe. Astor Perry
 A.R. Arthur Robertis
 A.R. Alexander Rich
 A.R. Arthur Rich
 A.R.A. Arthur R. Ayers
 A.R.B. Anna Ruth Brummett
 A.R.C. Anthony R. Cooper
 A.R.E. Arthur R. Eckels
 A.R.J. Arthur R. Jensen
 A.R.M. Armand R. Maggenti
 A.R.F. Allison R. Palmer
 A.H.R. Augustus R. Rogowski
 A.S. Abdus Salam
 A.Sa. Allan Sandage
 A.Sc. Anton Schindler
 A.Sch. Arnold Schecter
 A.Se. Alvin Seiff
 A.St. Alfred Steinschneider
 A.S.C. Alden S. Crafts
 A.S.Co. Alan S. Cohen
 A.S.G. Alfred S. Goldhaber
 A.S.L. A. Starker Leopold
 A.S.L.H. A. S. L. Hu
 A.S.N. Alberto S. Nieto
 A.SP. Albert S. Palmerlee
 A.S.R. Alfred S. Homer
 A.S.Ru. Allen S. Russell
 A.S.W. Arthur S. Wightman
 A.T. Albert Tyler
 A.T.A. Alfred T. Anderson, Jr.
 A.T.W. Andrew T. Weil
 A.T.Z. Andrew T. Zander
 A.V.C. A. V. Corlett
 A.W. Abraham White
 A.W.A. Arthur W. Adamson
 A.W.B. Alan W. Bernheimer
 A.W.C. Arthur W. Cooper
 A.W.C.V.G. Alexander W. C. von Graevenitz
 A.W.F. Arthur W. Francis
 A.W.J. A. Walter Jacobson
 A.W.K. Anthony W. Knapp
 A.W.O. Albert W. Overhauser
 A.W.W. Andrew W. Wayne

B

B.A.B. B. Austin Barry
 B.A.C. Bernard A. Galler
 B.B. Benjamin Bederson
 B.B.B. Blake B. Brantley, Jr.
 B.B. Fraxton B. Carr
 B.B.C. Burton B. Crocker
 B.B.Cu. Barrie B. Cunningham
 B.B.H. Bennett B. Murdock, Jr.
 B.C. Benjamin Chu

B.C.C. Bryan C. Chakoumakos
 B.C.H. Bernard C. Hainline
 B.C.He. Bruce C. Heezen
 B.D. Bruce Dan
 B.DeF. Brian DeFacio
 B.E.B. Breck E. Byers
 B.E.P. Bernar^d E. Proctor
 B.E.R. Bryant E. Rees
 B.E.S.G. Brian E. S. Gunning
 B.E.W. Bertram E. Warren
 B.F. Bernard Frank
 B.Fr. Benjamin Fruchter
 B.F.H. Benjamin F. Howell, Jr.
 B.F.J. B. Frank Jones, Jr.
 B.F.T. Benjamin F. Trump
 B.F.W. B. F. Wilson
 B.G. Bernard Goodman
 B.G.B. Brian G. Bagley
 B.G.D. B. Gale Dick
 B.G.M. Bruce G. Malloy
 B.H. Bernard Haber
 B.He. Bernd Heinrich
 B.Hoc. Brian Hocking
 B.Hog. Brigid Hogan
 B.Hop. Bruce Hopper
 B.H.B. Benjamin H. Beard
 B.H.Bi. Bruce H. Billings
 B.H.K. Bostwick H. Ketchum
 B.H.McC. Bayard H. McConnaughey
 B.H.W. Byron H. Waksman
 B.I.S. Bernard I. Spinrad
 B.J.B. Bart J. Bok
 B.J.D.M. Bastiaan J. D. Meense
 B.J.F. Barry J. Feldman
 B.J.K. Brian J. Kilbey
 B.J.M. Basil J. Mason
 B.J.Mu. Brent J. Muus
 B.J.W. Ben J. Wattenberg
 B.J.Wo. B. J. Wood
 B.J.Wu. Bernhardt J. Wuensch
 B.J.Z. Bruno J. Zwolinski
 B.K. Blair Kinsman
 B.Ku. Bernhard Kummel
 B.L. Bernard Lewis
 B.L.A. Benjamin L. Averbach
 B.L.B. Blaine L. Blad
 B.L.D. Barry L. Doolan
 B.L.Kl. Benny L. Klock
 B.L.R. Burtis L. Robertson
 B.L.S. Bernard L. Segal
 B.M. Bruce Margon
 B.Mi. Barry Miller
 B.M.C. Brian M. Chapman
 B.M.G. Beverly M. Guirard
 B.M.L. Bernard M. Leadon
 B.M.McC. Barry M. McCoy
 B.M.S. Bruce M. Sankey
 B.N.B. Bertram N. Brockhouse
 B.N.H. Bruce N. Haugh
 B.N.T. Barry N. Taylor
 B.O.B. Berthold O. Bergh
 B.P. Burton Paul
 B.Pi. Benjamin Pinkel
 B.Po. Bogdan Povh
 B.R. U.S. Bureau of Reclamation
 B.Ri. Betty Richman
 B.Ro. Barry Rosen
 B.Ru. Bruce Runnegar

B.R.W. Bennie R. Ware
 B.S. Bobb Schaeffer
 B.Si. Barry Simon
 B.St. Brian Stevens
 B.S.D. Bernard S. Dudock
 B.S.G. Bernard S. Greensfelder
 B.S.M. Bernard S. Meyer
 B.S.-N. Bodil Schmidt-Nielsen
 B.S.O. Bruce S. Old
 B.T.H. Brent T. Hailpern
 B.T.S. Bradley T. Scheer
 B.V. Bernard Vonnegut
 B.V.B. Burton V. Barnes
 B.V.Bu. Bohdan V. Burachinsky
 B.W. Bonnie Webber
 B.W.A. Barry W. Ache
 B.W.G. Bruce W. Gonser
 B.W.N. Benjamin W. Niebel
 B.-Y.T. Bor-Yeu Tsaur

C

C.A. Chris Adams
 C.A.A. Chester A. Arnold
 C.A.C. Carleton A. Chapman
 C.A.Co. Charles A. Cohen
 C.A.E. C. A. Evans, Jr.
 C.A.K. C. Arthur Knight
 C.A.M. C. Ajmone Marsan
 C.A.Mo. Charles A. Moore
 C.A.R. Charles A. Ross
 C.A.Re. Charles A. Reed
 C.A.S. Charles A. Scarlott
 C.A.Sch. Charles A. Schroeder
 C.A.T. Cornelius A. Tobias
 C.A.Z. Carl A. Zapffe
 C.B. Charles Baltay
 C.Ba. Catherine Badgley
 C.Be. Clyde Berg
 C.Bu. Charles Butler
 C.B.B. Charles B. Beck
 C.B.C. Charles B. Curtin
 C.B.D. C. B. Duke
 C.B.G. C. B. Gillies
 C.B.O. Charles B. Ogburn
 C.B.P. Cornelius B. Philip
 C.B.S. C. B. Skotland
 C.B.T. Charles B. Tompkins
 C.B.V.N. Cornelia B. Van Niel
 C.B.W. Curtis B. Wilson
 C.C. Charles Collinson
 C.C.B. Clanton C. Black, Jr.
 C.C.C. C. C. Cutler
 C.C.D. Charles C. Davis
 C.C.Du. Charles C. Duncan
 C.C.H. Christos C. Halkias
 C.C.Ho. C. Clayton Hoff
 C.C.K. Clifford C. Klick
 C.C.L. Ching Chun Li
 C.C.W. Carl C. Wamser
 C.D. Carl Dover
 C.D.B. Carl D. Broadbent
 C.DeB. Carl de Boor
 C.D.C. C. Denise Caldwell
 C.DeD. Christian de Duve

C.D.G. C. D. Gelatt, Jr.
 C.D.H. Charles D. Hurd
 C.D.M. C. D. Moak
 C.D.O. Charles D. Oviatt
 C.D.T. C. Donnell Turner
 C.E. U.S. Army Corps of Engineers
 C.E.A. Charles E. Applegate
 C.E.B. Clark E. Bricker
 C.E.C. Chester E. Cross
 C.E.H. Carl E. Howe
 C.E.L. Cecil E. Land
 C.E.La. Charles E. Lapple
 C.E.M. Charles E. Moyer, Jr.
 C.E.P. Charles E. Packard
 C.E.S. Charles E. Stonecker
 C.E.Sm. Carl E. Smith
 C.E.T. Clair E. Terrill
 C.E.V. Cecil E. Vanderzee
 C.E.W. Clyde E. Wiegand
 C.F. Cyrus Feldman
 C.Fr. Clifford Frondel
 C.F.A. C. F. Andrus
 C.F.C. Charles F. Curtiss
 C.F.F. Carl F. Floe
 C.F.G. Clarence F. Goodheart
 C.F.K. Carl F. Kayan
 C.F.N. Charles F. Niven, Jr.
 C.F.Q. C. F. Quate
 C.F.S. Charles F. Squire
 C.F.S.S. C. F. Stewart Sharpe
 C.F.T. C. F. Tsang
 C.G.G. Chauncey G. Goodchild
 C.G.S. C. George Segeler
 C.G.St. Christos G. Stergis
 C.H. Cadet Hand
 C.Ho. Cecil Hongie
 C.H.B. Catherine H. Bailey
 C.H.C. Clarence H. Cleminshaw
 C.H.Ch. Charles H. Chestnut III
 C.H.Co. Carl H. Cotterill
 C.H.D. Charles H. Drake
 C.H.H. Charence H. Hanson
 C.H.He. Charles H. Henry
 C.H.L. Choh Hao Li
 C.H.M. Carl H. Meyer
 C.H.S. Christopher H. Scholz
 C.H.Sp. Charles H. Sprankle
 C.H.St. Calvin H. Stevens
 C.H.T. Charles H. Townes
 C.I.K. Clarence I. Kado
 C.J.A. Constantine J. Alexopoulos
 C.J.B. Charles J. Baer
 C.J.G. Charles J. Goebel
 C.J.Go. Clarence J. Goodnight
 C.J.H. C. Jack Hearn
 C.J.He. Carl J. Helmers
 C.J.Her. C. J. Herman
 C.J.K. Charles J. Kensler
 C.J.P. Charles J. Papuchis
 C.J.R. Chalmer J. Roy
 C.K. Cornelis Klein
 C.K.B. Charles K. Bradsher
 C.K.J. C. K. Jen
 C.K.N.P. C. K. N. Patal
 C.K.T. Charles K. Taft
 C.K.W. Charles K. Weichert
 C.L. Carl Lamanna

C.L.A. Charles L. Alley
 C.L.B. Charles L. Bauer
 C.L.C. Charles L. Camp
 C.L.Ch. Charles L. Christ
 C.L.D. Clive L. Dym
 C.L.M. Charles L. Mantell
 C.L.Ma. Clement L. Markert
 C.L.N. Curtis L. Newcombe
 C.L.P. C. Ladd Prosser
 C.L.R. Charles L. Rulfs
 C.L.W. C. Langdon White
 C.M. Charles Mangion
 C.Ma. C. Martinson
 C.M.A. Charles M. Antoni
 C.M.H. Cyril M. Harris
 C.M.S. Cheng-Mei Shaw
 C.M.Si. Chester M. Sinnett
 C.M.Y. C. Maurice Yonge
 C.N. Claes Nylander
 C.N.G. Charles N. Gaylord
 C.N.Sh. Carl N. Shuster
 C.N.Y. C. N. Yang
 C.O. Cristian Orrego
 C.O.D. Carl O. Dunbar
 C.O.hE. Colm O hEocha
 C.P. Carl Pfaffman
 C.P.B. Charles P. Brewer
 C.P.L. Charles P. Lyman
 C.P.R. Clark P. Read
 C.P.S. Charles P. Slichter
 C.P.Sm. C. Price Smith
 C.P.So. Charles P. Sonett
 C.P.Sw. Carl P. Swanson
 C.Q. Chris Quigg
 C.Qu. Carol Quaike
 C.R. Claudio Rebbi
 C.Ru. Charles Rulfs
 C.R.C. Clark R. Chapman
 C.R.F. Charles R. Fournier
 C.R.L. Chester R. Longwell
 C.R.Lo. Christopher R. Lowe
 C.R.M. Charles R. Marsland
 C.R.Ma. C. R. Martinson
 C.R.S. Charles R. Stephens
 C.R.W. Charles R. Wilke
 C.R.Wi. Clifton R. Williamson
 C.R.Wo. Carl R. Woese
 C.S. Christen Skaar
 C.S.C. Charles S. Cox
 C.S.Cr. Calvin S. Cronan
 C.S.H. C. S. Hammen
 C.S.He. Carl S. Herz
 C.S.Hu. Cornelius S. Huribut, Jr.
 C.S.P. Carl S. Pederson
 C.S.V. Carl S. Vestling
 C.S.Y. Ching-Sung Yu
 C.T.C. C. T. Chen
 C.T.K. Charles T. Kowal
 C.T.S. Chester T. Sims
 C.T.T. Charles T. Tart
 C.V. Claude Veillon
 C.V.C. Charles V. Crittenden
 C.V.S. C. V. Shank
 C.W. Colin White
 C.Wi. Conrad Wickstrom
 C.W.B. Carl W. Boothroyd
 C.W.By. Charles W. Byers
 C.W.D. Clifton W. Draper
 C.W.E. C. Wayne Ellett

C.W.K. Chung W. Kim
 C.W.N. Chester W. Newton
 C.W.Ni. Charles W. Nixon
 C.W.S. C. W. Siegmund
 C.W.Si. C. W. Sisler
 C.W.Sw. Charles W. Swithinbank
 C.W.T. Charles W. Turner
 C.W.V. Charles W. Vokac

D.A. David Adler
 D.Al. David Altman
 D.Ar. Donald Armstrong
 D.Ay. D. Aylmer
 D.A.B. D. Allan Bromley
 D.A.K. David A. Keith
 D.A.L. Donovan A. Ljung
 D.A.M. Douglas A. Marsland
 D.A.Me. Duncan A. Meillichamp
 D.A.R. David A. Reid
 D.A.Ro. David A. Ross
 D.A.S. David A. Shirley
 D.A.W. Donald A. Wilbur, Sr.
 D.A.Y. David A. Young
 D.B. David Barr
 D.Be. David Beaglehole
 D.Br. Dirk Brouwer
 D.Bu. Donald Burdick
 D.Bur. Dave Bursky
 D.B.C. David B. Cohen
 D.B.D. Daniel B. Dallas
 D.B.H. David B. Harrison
 D.B.J. Deane B. Judd
 D.B.M. David B. Meyer
 D.B.P. David P. Pisoni
 D.B.S. Donald B. Sinclair
 D.B.W. Douglas B. Webster
 D.C. David Cohen
 D.Ca. David Casasent
 D.C.B. D. C. Beumariage
 D.C.C. David C. Coleman
 D.C.G. Detlef C. Gloge
 D.C.H. David C. Hazen
 D.C.J. Donald C. Jackson
 D.C.W. David C. Weber
 D.C.Wh. David C. White
 D.D.D. D. Dwight Davis
 D.D.Do. Donald D. Dodge
 D.D.F. Dudley D. Fuller
 D.D.J. Dennis D. Juranek
 D.D.MacC. Donnell D. MacCarthy
 D.D.McC. Dennis D. McCarthy
 D.D.P. David D. Perkins
 D.D.R. D. D. Robb
 D.D.Ra. David D. Rabb
 D.D.Ru. David D. Rubis
 D.D.S.T. Donovan Des S. Thomas
 D.E. Dorothy Eichorn
 D.E.A. David E. Alburger
 D.E.B. Donald E. Becker
 D.E.D.-B. Derek E. Denny-Brown
 D.E.E. David E. Ellis
 D.E.F. David E. Fogarty
 D.E.G. David E. Giannasi

D.E.H. Dennis E. Hayas
D.E.K. Dale E. Kester
D.E.Ki. David E. Kissel
D.E.O. Donald E. Oline
D.E.R. Duane E. Rejler
D.E.S. Donald E. Savage
D.E.T. Douglas E. Tuttle
D.E.W. Daniel E. Whitney
D.F. Denis Forster
D.F.O. Donald F. Othmer
D.F.Ow. Denis F. Owen
D.F.P. Donald F. Poulson
D.G. D. Gauss
D.G.F. Donald G. Fink
D.G.Fa. David G. Freiman
D.G.Fre. David G. Frey
D.G.K. Dennis G. Kovar
D.G.S. Demetrios G. Samaras
D.G.Sc. Donald G. Schuele
D.H. Dorothy Hill
D.H.A. David H. Abrahams
D.H.B. Daryle H. Busch
D.H.G. David H. Goodstein
D.H.K. David H. Klein
D.H.Ka. David H. Katz
D.H.L. Derrick H. Lehmer
D.H.S. Daniel H. Sheingold
D.H.T. D. H. Tarling
D.H.Th. David Hurst Thomas
D.H.W. Denys H. Wilkinson
D.J. David Joravsky
D.J.C. Donald J. Cohen
D.J.Ca. D. J. Carlsson
D.J.E. Don J. Easterbrook
D.J.F. Dennis J. Fratley
D.J.Fu. Douglas J. Futyma
D.J.H. Dennis J. Herrell
D.J.Ho. D. J. Horen
D.J.Hor. David J. Horn
D.J.J. Daniel J. Jones
D.J.L. D. J. Lewis
D.J.M. D. J. Morré
D.J.N. David J. Nesbitt
D.J.O. Donald J. O'Connor
D.J.P. Donald J. Patton
D.J.R. Dewey J. Raski
D.J.S. David J. Sellmeyer
D.J.S.B. Donald J. S. Barr
D.J.T. Douglas J. Theis
D.J.W. Daniel J. Weiler
D.J.Wa. Deborah Jean Warner
D.K. Daniel Kaizer
D.K.S. David K. Scott
D.L. David Lagunoff
D.La. David Layzer
D.Laz. David Lazarus
D.Le. D. Lewis
D.Led. Daniel Lednicher
D.Lo. Donald Louis
D.Low. David Lowenthal
D.L.A. Daniel L. Azarnoff
D.L.D. David L. Dalrymple
D.L.G. Dwight L. Glasscock
D.L.H. Donald L. Holt
D.L.L. Douglas L. Inman
D.L.J. Donald Lee Johnson
D.L.P. Donald L. Price
D.L.T. Donald L. Turrell

D.L.W. Donald L. Waldelich
D.L.We. Donald L. Weaver
D.M. Daniel Mazia
D.Mo. David Morrison
D.M.DeL. Dwight M. DeLong
D.M.F. David M. Farmer
D.M.Fr. David M. Fradkin
D.M.G. David M. Greenberg
D.M.Gr. Dieter M. Gruen
D.M.H. David M. Hodgkin
D.M.Hu. Donald M. Huntten
D.M.L. David M. Larsen
D.M.Lu. Donald M. Lunetta
D.M.P. Daniel M. Popper
D.M.S. David M. Smith
D.M.V. Daniel M. Viccione
D.M.W. D. M. Wiles
D.M.Y. Don M. Yost
D.N. David Nachmansohn
D.N.H. Douglas N. Halbe
D.N.K. David N. Keast
D.N.L. D. N. Langenberg
D.N.La. Daniel N. Lapedes
D.O.H. David O. Haynes
D.P. David Park
D.P.A. Donald P. Abbott
D.P.Ad. Douglas P. Adams
D.P.An. D. Phillip Ankeney
D.P.B. David P. Barash
D.P.G. Daniel P. Griffin
D.Q.L. D. Q. Lamb
D.R. Donald Raum
D.Ru. Dorothea Rudnick
D.R.C. Donald R. Calvert
D.R.Co. Dean R. Collins
D.R.D. Donald R. Dimmel
D.R.F.H. Donald R. F. Harleman
D.R.J. David R. Jones
D.R.N. David R. Nygren
D.R.P. Donald R. Peacor
D.R.S. Donald R. Stranks
D.R.V. David R. Veblen
D.S. Dave Scott
De.S. Dennis Stanford
D.Si. David Siminovitch
D.Sim. Daniel Simberloff
D.St. Donald Stansbarger
D.Ste. Dewey Stewart
D.Sw. Daniel Swern
D.S.B. Douglas S. Billington
D.S.Br. David S. Breslow
D.S.C. Dennis S. Charney
D.S.G. D. S. Grosch
D.S.Ge. Donald S. Gemmel
D.S.H. Donald S. Hayes
D.S.He. David S. Hepler
D.S.K. Douglas S. Kellogg
D.S.L. Daniel S. Lehrman
D.S.P. David S. Palermo
D.S.V.F. D. S. Van Fleet
D.T. David Turnbull
D.T.L. David T. Lykken
D.T.R. Donald T. Reay
D.V.M. Dal V. Maddalon
D.V.Mo. Donald V. Moore
D.V.W. David V. Widder
D.W. Daniel Wellner
D.Wi. Dudley Williams

D.Wis. Dennis Wisnosky
D.Wo. David Wollersheim
D.W.B. Donald W. Banner
D.W.C. David W. Curkendall
D.W.E.S. David W. E. Smith
D.W.F. Don W. Fawcett
D.W.K. Donald W. Kerst
D.W.Ki. Donald W. King
D.W.Ku. Donald W. Kupke
D.W.L. David W. Latham
D.W.M. David W. Mizell
D.W.S. David W. Steadman
D.X.F. Daniel X. Freedman

E

E.A. Ellhu Abrahams
E.Ad. Elijah Adams
E.An. Everett Anderson
E.At. Ellsha Atkins
E.A.A. Edward A. Ackerman
E.A.Ad. Edward A. Adelberg
E.A.B. Edward A. Boyden
E.A.C. Edsel A. Caine
E.A.F. E. A. Freundt
E.A.G. Earl A. Gulbransen
E.A.H. Eugene A. Hollowell
E.A.K. Elbert A. King
E.A.L. Edmund A. Laport
E.A.S. Edward A. Smuckler
E.B. E. Bauer
E.B.C. Edward B. Curdts
E.B.Cu. Edward B. Cutler
E.B.F. E. B. Ford
E.B.R. Evans B. Reid
E.B.W. E. Bright Wilson, Jr.
E.C. Ellen Clarke
E.Co. Ernest Coleai
E.C.A. Ellsworth C. Alvord, Jr.
E.C.J. Earl C. Joseph
E.C.Jo. Edwin C. Jones, Jr.
E.C.L. Edward C. Luckenbach
E.C.M. Earl C. Mansfield
E.C.O. Everett C. Olson
E.C.P. E. C. Pielou
E.C.Po. Edward C. Polhamus
E.C.Pol. Ernest C. Pollard
E.C.R.-R. Edward C. Roosen-Runge
E.C.S. Eugene C. Starr
E.C.St. Edward C. Stevenson
E.C.Stu. Erwin Charles Stumm
E.C.T.C. Edward C. T. Chao
E.D. Eric Delson
E.Do. Erling Dorf
E.D.A. E. Dwight Adams
E.D.B. Eugene D. Becken
E.D.C. Eugene D. Commins
E.D.G. Edward D. Goldberg
E.E.C. Ernest E. Charlton
E.E.Co. Earl E. Coulter
E.E.F. Eberhard E. Fetz
E.E.S. Esmond E. Snell
E.E.U. Erwin E. Underwood

E.E.W. **E. Eugene Weaver**
 E.F. **Emerson Foulke**
 E.Fi. **Eric Firing**
 E.F.A. **Earl F. Arbuckle, III**
 E.F.H. **Edward F. Hammel**
 E.F.Ha. **Edward F. Harford**
 E.F.L. **Edward F. Leonard**
 E.F.McB. **Earle F. McBride**
 E.F.N. **Ernest F. Nipples**
 E.F.S. **Emil F. Steinert**
 E.F.T. **Edward F. Tedesco**
 E.F.W. **Elliott F. Wright**
 E.G. **Edward Gerjuoy**
 E.Gr. **Emil Grosswald**
 E.Gru. **Emanuel Grunberg**
 E.G.B. **Elmer G. Butler**
 E.G.C. **Elizabeth G. Cutter**
 E.G.H. **E. G. Heyne**
 E.G.N. **Elton G. Nelson**
 E.G.P. **Edward G. Partridge**
 E.G.Pr. **Ernest G. Pringsheim**
 E.G.R. **Edward G. Ramberg**
 E.G.Ro. **Eugene C. Rochow**
 E.G.S. **Emilio G. Segré**
 E.G.St. **Edward G. Stuart**
 E.G.W. **Ernest G. Weber**
 E.H.A. **Elbert H. Ahlstrom**
 E.H.Ap. **Evan H. Appelman**
 E.H.B. **Earl H. Beistline**
 E.H.Br. **Edgar H. Bristol**
 E.H.C. **Edward H. Cole**
 E.H.H. **Elbert H. Hadley**
 E.H.Ha. **Edwin H. Hammond**
 E.H.Q. **Edith H. Quimby**
 E.H.R. **Ernest H. Runyon**
 E.H.S. **Edgar H. Sibley**
 E.H.St. **Elmer H. Stotz**
 E.H.W. **Earl H. Wood**
 E.I. **Earl Ingerson**
 E.J. **Erik Jarvik**
 E.Jo. **Edward Johnson**
 E.Ju. **Evan Just**
 E.J.A. **E. James Archer**
 E.J.B. **Edward J. Beckhorn**
 E.J.Bo. **Edgar J. Boell**
 E.J.F.W. **Edward J. F. Wood**
 E.J.G. **Edward J. Groth**
 E.J.L. **Eugene J. Lempel**
 E.J.M. **Earl J. Merwin**
 E.J.Q. **Edward J. Quirin**
 E.J.T. **Edward J. Triebe**
 E.K. **Ernest Kent**
 E.Ke. **Edwin Kessler**
 E.Ki. **Eileen Kintsch**
 E.Kr. **Ernst Kramer**
 E.K.H. **Earl K. Hyde**
 E.K.K. **Edward K. Kaprelian**
 E.L. **E. Lazarides**
 E.Le. **Edward Leete**
 E.L.B. **Ernst L. Biberstein**
 E.L.C. **Earl L. Core**
 E.L.E. **Ernest L. Eliel**
 E.L.G. **Edward L. Ginzton**
 E.L.Ga. **Emil L. Gavlick**
 E.L.H. **Edwin L. Hamilton**
 E.L.Hi. **Edward L. Hill**
 E.L.L. **Elbert L. Little, Jr.**
 E.L.P. **E. Lowe Pierce**

E.L.Po. **Ernest L. Pollitzer**
 E.L.S. **Everett L. Saul**
 E.L.T. **Edwin L. Turner**
 E.L.V.C. **Ernest L. Van Campenhout**
 E.L.W. **Erwin L. Weber**
 E.L.Wr. **Edward L. Wright**
 E.L.Y. **Ellis L. Yochelson**
 E.M. **Ernesto Marcus**
 Ev.M. **Eveline Marcus**
 E.Me. **Edward Meyers**
 E.M.B. **Elliott M. Blass**
 E.M.Br. **Edward M. Breinan**
 E.M.C. **Edward M. Cohart**
 E.M.Co. **Esther M. Conwell**
 E.M.E. **Eugene M. Ettenberg**
 E.M.Ey. **Edward M. Eyring**
 E.M.H. **Elaine M. Hendry**
 E.M.L. **Edwin M. Larsen**
 E.M.M. **Emil M. Mrak**
 E.M.R. **Eugene M. Rasmussen**
 E.M.S. **Edith M. Sheppard**
 E.M.W. **Everard M. Williams**
 E.M.Wi. **Eva M. Winzler**
 E.M.Wis. **Edmund M. Wise**
 E.M.Y. **Edward M. Young**
 E.N. **Ernest Naylor**
 E.Ne. **Erwin Neter**
 E.No. **Eskel Nordell**
 E.N.G. **Edgar N. Gilbert**
 E.N.H. **E. Newton Harvey**
 E.N.Ha. **Eastman N. Hatch**
 E.N.S. **E. N. Skinner**
 E.O.D. **Edward O. Dodson**
 E.P. **Elliot Postow**
 E.P.E. **Elbridge P. Eaton**
 E.P.O. **Eugene P. Odum**
 E.P.P. **Edwin P. Plueddemann**
 E.P.S. **Ellis P. Steinberg**
 E.R. **Ernest Rabinowicz**
 E.Ra. **Erwin Raisz**
 E.Ro. **Elliott Robbins**
 E.R.B. **Elery R. Becker**
 E.R.C. **Earle R. Caley**
 E.R.Ca. **E. R. Carson**
 E.R.D. **Ellen R. Dirksen**
 E.R.G. **Edwin R. Gilliland**
 E.R.H. **Egbert R. Hardesty**
 E.R.J. **E. Ruffin Jones**
 E.S. **Ernest Schweizer**
 E.Se. **Emilio Segré**
 E.S.B. **Elso S. Barghoorn**
 E.S.Ba. **Edward S. Barnitz**
 E.S.F. **Edward S. Fry**
 E.S.G. **Emery St. George, Jr.**
 E.S.R. **Edward S. Ross**
 E.S.Y. **Edward S. Yang**
 E.T. **Erik Trinkaus**
 E.T.C. **Emil T. Chanlett**
 E.U.G. **E. U. Condon**
 E.W. **Ernest Wenkert**
 E.W.A. **Edward W. Allen, Jr.**
 E.W.B. **Edward W. Baker**
 E.W.C. **Edward W. Comings**
 E.W.G. **Edward W. Gore, Jr.**
 E.W.Ge. **Erwin W. Gelfand**
 E.W.H. **E. William Heinrich**
 E.W.He. **E. Wendell Hewson**

E.W.K. **Edward W. Kimbark**
 E.W.M. **Erwin W. Müller**
 E.W.Me. **E. W. Merrill**
 E.W.T. **Elmer W. Travis**
 E.Y. **Eiju Yatsu**

F

F.A.B. **Frank A. Brown, Jr.**
 F.A.C. **Frank A. Carone**
 F.A.Ch. **Fenner A. Chace, Jr.**
 F.A.G. **Frank A. Geidard**
 F.A.J. **Francis A. Jenkins**
 F.A.L. **Franklin A. Long**
 F.A.L.C. **F. A. L. Clowes**
 F.A.M. **Frederick A. Murphy**
 F.A.R. **Francis A. Richards**
 F.B. **Fred Barker**
 F.Ba. **Fred Basolo**
 F.B.B. **France B. Berger**
 F.B.G. **F. B. Golden**
 F.B.Go. **Frank B. Golley**
 F.B.P. **Frederick B. Pogust**
 F.B.S. **Frank B. Salisbury**
 F.B.Sh. **Frederick B. Shuman**
 F.B.T. **Franz B. Tuteur**
 F.B.V.H. **Franklyn B. Van Houten**
 F.B.W. **Frank B. Wood**
 F.C. **Francis Clark**
 F.Cr. **Friedrich Cramer**
 F.C.B. **Frank C. Banner**
 F.C.Br. **Fredrick C. Brown**
 F.C.H. **F. Clark Howell**
 F.C.M. **Frank C. Mock**
 F.C.R. **Fredrick C. Redlich**
 F.C.S. **Ferris C. Standiford**
 F.C.St. **Frank C. Sturges**
 F.D. **Farrington Daniels**
 F.Du. **Floyd Dunn**
 F.D.B. **Frank D. Brooks**
 F.D.C. **Franklin D. Cooper**
 F.D.DeV. **Fred D. DeVaney**
 F.D.K. **Fred D. Kochendorfer**
 F.D.L. **Frank D. Lewis**
 F.D.P. **Frank D. Popp**
 F.E.E. **Frank E. Egler**
 F.E.F. **Floyd E. Ford**
 F.E.Fo. **F. E. Foss**
 F.E.G. **Frank E. Gardner**
 F.E.J.F. **Fredrick E. J. Fry**
 F.E.N. **Fred E. Nicodemus**
 F.E.S. **Frank E. Snodgrass**
 F.F. **Ferdinand Freudenstein**
 F.F.E. **Fredric F. Ehrlich**
 F.F.R. **Frank F. Richards**
 F.F.W. **Felix F. Wu**
 F.G.B. **Frederick G. Bailly**
 F.G.C. **Forrest G. Chumley**
 F.G.D. **Frank G. Dollear**
 F.G.E. **F. G. Ely**
 F.G.Et. **Frank G. Ethridge**
 F.G.Ev. **F. Gaynor Evans**
 F.G.H. **Frank G. Hawksworth**
 F.G.S. **F. G. Shinskey**

F.H.B. Frank H. Bower
 F.H.F. Frederick H. Fisher
 F.H.L. Fritz H. Laves
 F.H.Lu. Frank H. Ludlam
 F.H.M. F. H. May
 F.H.R. Frank H. Rockett
 F.H.-Ro. Frederick Hayes-Roth
 F.H.S. Frank H. Shelton
 F.H.Sp. Frank H. Spedding
 F.H.T. Frank H. Taylor
 F.I. Franco Iachello
 F.J.A. Frederick J. Almgren, Jr.
 F.J.An. Francis J. Anscombe
 F.J.B. Frank J. Blatt
 F.J.D. Frank J. DiSalvo
 F.J.E. F. J. Edeskuty
 F.J.G. Fred J. Gruenberger
 F.J.J. Francis J. Johnston
 F.J.L. Frank J. Lockhart
 F.J.R. Fred J. Rosenbaum
 F.J.S. F. J. Simpson
 F.K. Fritz Kalhammer
 F.Ke. Frederic Keffer
 F.K.H. Forest K. Harris
 F.K.L. Frank K. Lawler
 F.L. Fritz Laves
 F.Li. Folke Linder
 F.L.H. F. L. Hermach
 F.L.S. Frederic L. Schwab
 F.L.W. Frank L. Warner
 F.M. Freydoon Mansouri
 F.M.B. Frances M. Brodsky
 F.M.C. Frank M. Carpenter
 F.M.F. Frederick M. Fowkes
 F.McL.M. Frank McL. Mallett
 F.M.P. Francis M. Pipkin
 F.M.R. Francis M. Rogallo
 F.M.W. Floyd M. Wahl
 F.M.We. Frances M. Weesner
 F.P.S. Francis P. Shepard
 F.R. Floyd Ratliff
 F.Ro. F. Rohrllich
 F.Ru. Fritz Ruch
 F.R.B. F. R. Boyd
 F.R.E.C. F. R. E. Crossley
 F.R.F. F. R. Fosberg
 F.R.H. Frederick R. Hanson
 F.R.K. Fazlur R. Khan
 F.R.Ko. F. Ralph Kotter
 F.R.M. Frederick R. Miller
 F.R.McF. Forest R. McFarland
 F.R.V. Frank R. Voorhees
 F.R.Vo. Fred R. Volkmar
 F.S. Frederick Sanders
 F.St. Fred Sterzer
 F.S.G. Fred S. Goulding
 F.S.J. Francis S. Johnson
 F.S.M. Frederick S. Merritt
 F.S.S. Frederick S. Szalay
 F.T.A. Fredrick T. Addicott
 F.T.L. F. Thomas Ledig
 F.T.T. Fredrick T. Thwaites
 F.V. Felix Viro
 F.V.G. Fred V. Grau
 F.V.K. Frank V. Kosikowski
 F.V.L. F. V. Lenel
 F.W. Frank Wagner
 F.We. Fritz Weigel
 F.Wh. Frank Whiting

F.Wi. Fred Wilt
 F.Wu. Fred Wudl
 F.W.B. Fred W. Billmeyer, Jr.
 F.W.H. Friedrich W. Hoffmann
 F.W.K. F. W. Karasek
 F.W.Ko. Frederick W. Koerker
 F.W.K.F. Frank W. K. Firk
 F.W.M. Franklin W. Martin
 F.W.S. Fred W. Smith
 F.W.Sw. F. W. Sweat
 F.W.T. Fred W. Tanner, Jr.
 F.W.Z. Frank W. Zink

G

G. Govindjee
 G.A. Gordon Atkinson
 G.A.A. Gregory A. Ahern
 G.A.D. Gregory A. Davis
 G.A.E. George A. Economou
 G.A.H. George A. Hawkins
 G.A.Ho. G. A. Horton
 G.A.L. George A. Ledingham
 G.A.M. Gordon A. Macdonald
 G.A.Mo. Gary A. Moll
 G.A.R. G. Alan Robison
 G.A.S. G. Alan Solem
 G.A.W. Gary A. Williams
 G.B. Gunnar Backstrom
 G.Bi. Garrett Birkhoff
 G.B.H. George B. Hess
 G.B.P. Gayle B. Priestler
 G.C.G. Gerard C. Gamba
 G.C.K. George C. Kennedy
 G.C.Ke. George C. Kent, Jr.
 G.D. Gerhard Derge
 G.De. Guy Deutscher
 G.D.B. Glenn D. Breuer
 G.D.F. George D. Fulford
 G.D.G. George D. Garland
 G.D.Go. Gary D. Gordon
 G.D.S. Guy D. Smith
 G.DeV. Gerard De Vauconleure
 G.E.A. G. E. Archie
 G.E.E. George E. Ewing
 G.E.L. George E. Liedholm
 G.E.Li. Gene G. Likens
 G.E.Liv. Gideon E. Livingston
 G.E.P. George E. Pake
 G.E.Pe. Gertrude E. Perlmann
 G.E.S. Garland E. Scott
 G.E.St. George E. Stapleton
 G.E.Str. Gary E. Striker
 G.F. Gioacchino Failla
 G.Fa. Gerhard Fankhauser
 G.Fau. Gunter Faure
 G.Fi. Giuseppe Fidecaro
 G.F.B. George F. Bobart
 G.F.Be. George F. Bertsch
 G.F.F. Gordon F. Ferris
 G.F.L. George F. Ludvik
 G.F.O. Gilbert F. Otto
 G.F.P. George F. Pinder
 G.F.R. George F. Reddish
 G.F.W. George F. Wislicenus

G.G. Gerson Goldhaber
 G.Gr. Gene Grey
 G.Gu. G. Guzikski
 G.G.A. George G. Adkins
 G.G.B. Gabriel G. Barna
 G.G.L. Gordon G. Lill
 G.G.N. Graham G. Nicholson
 G.G.T. Gerald G. Thorne
 G.H. George Harvey
 G.Ho. Gerald Holton
 G.Hot. Grosvenor Hotchkiss
 G.H.B. Glenn H. Brown
 G.H.Ba. Grant H. Barlow
 G.H.C. Gilbert H. Cady
 G.H.D. George H. Davis
 G.H.Di. G. H. Dieke
 G.H.F. George H. Fried
 G.H.M. Glenn H. Miller
 G.H.Mo. George H. Morrison
 G.H.My. George H. Myer
 G.H.R. Gilbert H. Reiling
 G.J.G. Gerald J. Gastony
 G.J.H. George J. Haltiner
 G.J.W. George J. Wilder
 G.J.Z. George J. Zissis
 G.K. Georges Knaysi
 G.Kr. George Krauss
 G.K.C. George K. Celler
 G.L.B. Gordon L. Brownell
 G.L.C. Guy L. Childberg
 G.L.Cl. George L. Clark
 G.L.E. Gunther L. Eichhorn
 G.L.G. George L. Gaines
 G.L.Gi. Gerald L. Gilardi
 G.L.S. Gordon L. Shaw
 G.L.St. G. Ledyard Stebbins
 G.L.T. Gerald L. Thompson
 G.L.V. Gilbert L. Voss
 G.M. George Mandler
 G.Mi. Gardner Middlebrook
 G.Mo. Giuliana Moreno
 G.Mu. Glenn Murphy
 G.M.B. George M. Bouton
 G.M.C. Gerald M. Clemence
 G.M.G. Glenn M. Glasford
 G.M.Gu. Gay M. Guzikski
 G.M.K. Glen M. Kohls
 G.M.R. Gardner M. Reynolds
 G.M.S. George M. Savage
 G.M.Se. Gerhard M. Sessler
 G.N. Gerhard Neumann
 G.N.R. G. N. Richards
 G.O. Gerald Oster
 G.Ow. Guillermo Owen
 G.O.A. George O. Abell
 G.O.B. Glenn O. Bressler
 G.O.D. Gunter O. Dietrich
 G.O.R. Glibert O. Raasch
 G.P. George Papageorgiou
 G.Po. Guido Pontecovo
 G.P.K. Gerard P. Kuiper
 G.P.M. George P. Moore
 G.P.S. George P. Sutton
 G.R. George Rapp, Jr.
 G.R.C. Georgeanne R. Caughlan
 G.R.G. G. Ronald Gray
 G.R.H. George R. Harrison
 G.R.P. G. R. Peirce
 G.R.S. G. R. Schoonmaker

G.R.St. **George R. Sturtevant**
 G.R.St.P. **George R. St. Pierre**
 G.S. **George Sistare, Jr.**
 G.Sl. **George Slomp**
 G.Sm. **Gaylord Smith**
 G.Sp. **Garrison Sposito**
 G.C. **Gus Stavis**
 G.Sw. **George Switzer**
 G.S.C. **George S. Carter**
 G.S.G. **Gary S. Grest**
 G.S.H. **G. S. Hurst**
 G.S.M. **George S. Mill**
 G.S.T. **Gordon S. Taylor**
 G.T. **Geza Teleki**
 G.T.G. **Gerald T. Garvey**
 G.T.J. **Gideon T. James**
 G.T.S. **Glenn T. Seaborg**
 G.V.D. **George Van Dyne**
 G.V.M. **Gerard V. Middleton**
 G.W. **Gerald Weiss**
 G.W.B. **George W. Barlow**
 G.W.Br. **George W. Brindley**
 G.W.DeV. **George W. DeVore**
 G.W.G. **Gordon W. Groves**
 G.W.H. **Gertrude W. Hinsch**
 G.W.K. **George W. Kessler**
 G.W.M. **George W. Mackey**
 G.W.O'D. **George W. O'Dom**
 G.W.P. **Gerald W. Prescott**
 G.W.R. **G. Wilse Robinson**
 G.W.S. **George W. Stroke**
 G.Y.C. **Gilbert Y. Chin**

H.C.Wi. **Hurd C. Willett**
 H.C.Y. **Harry C. Yeatman**
 H.D. **H. Date**
 H.De. **Hans Dehmelt**
 H.Di. **Hugh Dingle**
 H.D.D. **H. D. Dooley**
 H.D.H. **Harold D. Hauf**
 H.D.He. **Hollis D. Hedberg**
 H.D.Ho. **Heinrich D. Holland**
 H.D.O. **Harold D. Orville**
 H.D.P. **Harry D. Patton**
 H.D.T. **Horace D. Taft**
 H.E. **Henry Eyring**
 H.E.C. **Harold E. Campbell**
 H.E.Ca. **Herbert E. Carter**
 H.E.D. **Henry E. Duckworth**
 H.E.E. **Harold E. Edgerton**
 H.E.McG. **Harold E. McGannon**
 H.E.N. **Homer E. Newell**
 H.E.R. **Harold E. Rosenberger**
 H.E.S. **Hans E. Suess**
 H.E.T. **Helmet E. Thiess**
 H.E.V.G. **Henning E. Von Gierke**
 H.E.W. **Hervey E. Wegner**
 H.F. **Herman Feshbach**
 H.Fi. **Harold Fischer**
 H.Fo. **Herbert Fox**
 H.Fr. **Hans Frebold**
 H.Fre. **Herbert Frey**
 H.F.G. **Harvey F. George**
 H.F.K. **Harold F. Klock**
 H.F.Kr. **Henry F. Krous**
 H.F.O. **Harry F. Olson**
 H.F.R. **Harry F. Remde**
 H.F.S. **Henry F. Schaefer, III**
 H.F.Sh. **Hugh F. Shannon**
 H.F.V. **Herbert F. Volk**
 H.F.W. **Harold F. Walton**
 H.G. **Harold Goodglass**
 H.Gr. **H. Gränicher**
 H.G.B. **Harriet G. Barclay**
 H.G.Ba. **Herbert G. Baker**
 H.G.Bo. **Holbrook G. Botset**
 H.G.C. **Harold G. Corwin, Jr.**
 H.G.M. **H. G. Marshall**
 H.G.S. **Heinz G. Sell**
 H.G.Sh. **Harley G. Sheffield**
 H.G.St. **H. G. Stubbings**
 H.H. **Henry Hellmers**
 H.H.B. **Harrison H. Barrett**
 H.H.F. **H. Hugh Fudenberg**
 H.H.H. **Henry H. Hausner**
 H.H.He. **Hans H. Hecht**
 H.H.Hec. **Harry H. Heckman**
 H.H.Ho. **Herman H. Hobbs**
 H.H.J.N. **Herbert H. J. Nesbitt**
 H.H.K. **Herbert H. Kellogg**
 H.H.L. **Heinz H. Lettau**
 H.H.M. **Hilton H. Mollenhauer**
 H.H.Mu. **Haydn H. Murray**
 H.H.R. **Herbert H. Ross**
 H.H.S. **Harry H. Sisler**
 H.H.Sk. **Hugh H. Skilling**
 H.H.Sm. **Harold H. Smith**
 H.H.St. **Henry H. Storch**
 H.H.Su. **Hans H. Suter**
 H.J. **Hans Jakobi**
 H.J.A. **Henry J. Albert**
 H.J.C. **H. John Carew**

H.J.Cl. **Harry J. Clausen**
 H.J.E. **H. John Evans**
 H.J.G. **Harold J. Gibson**
 H.J.H. **Harvey J. Hoge**
 H.J.L. **Harri J. Lipner**
 H.J.McL. **Hugh J. McLellan**
 H.J.P. **Herman J. Phaff**
 H.J.R. **Herbert J. Reich**
 H.J.S. **Harlan J. Smith**
 H.J.W. **Herbert J. Welshimer**
 H.J.Wi. **Herold J. Wiens**
 H.J.Wir. **Henry J. Wirry**
 H.K. **Herwig Kogelnik**
 H.K.W. **Helmut K. Weickmann**
 H.L. **Helge Larsen**
 H.La. **Harry Lass**
 H.Le. **Henry Leland**
 H.Li. **Helmut Lieth**
 H.Lip. **Harry Lipner**
 H.L.B. **H. L. Beggs**
 H.L.Bo. **Harry L. Bowman**
 H.L.C. **Helen L. Cannon**
 H.L.D. **Herbert L. Dupont**
 H.L.F. **Harold L. Friedman**
 H.L.G. **Henry L. Gabelnick**
 H.L.G.S. **Henry L. G. Stroyan**
 H.L.H. **Howard L. Hamilton**
 H.L.Ee. **Harry L. Helms**
 H.L.Ho. **Harold L. Hoffman**
 H.L.J. **Hans L. Jensen**
 H.L.K. **Henry L. Kinnier**
 H.L.S. **H. L. Shands**
 H.L.Sh. **Harry L. Shipman**
 H.L.St. **Herbert L. Stahnke**
 H.M. **Herbert Maisel**
 Ma. **Henry Margenau**
 Mar. **Harvey Marshak**
 H.Mo. **Hugh Morrow, III**
 H.M.B. **Harris M. Barte**
 H.M.G. **Hyatt M. Gibbs**
 H.M.H. **Howard M. Hickman**
 H.M.J. **H. Mark Johnston**
 H.M.M. **H. M. Munger**
 H.M.S. **Herman M. Schwartz**
 H.M.T. **Howard M. Temin**
 H.M.Ts. **Henry M. Tsuchiya**
 H.N.P. **Henry N. Pollack**
 H.N.W. **Henry N. Wagner, Jr.**
 H.O.H. **Harlyn O. Halvorsen**
 H.P.B. **Harlan P. Banks**
 H.P.H. **Harry P. Hale**
 H.P.T. **Henry P. Treffers**
 H.R. **Hans Rademacher**
 H.Ra. **Hans Ramberg**
 H.Ras. **Howard Rasmussen**
 H.Ri. **Herbert Riehl**
 H.R.B. **Howard R. Batchelder**
 H.R.C. **Hollis R. Cooley**
 H.R.H. **H. Rex Hartson**
 H.R.J. **Howard R. Jory**
 H.R.L. **Hans R. Lindner**
 H.S. **Hymin Shapiro**
 H.Sa. **Helmut Sauer**
 H.Si. **Hersche Sidransky**
 H.Sm. **Harry Smith**
 H.So. **Harry Sohon**
 H.S.A. **H. S. Aldwinkle**
 H.S.B. **Howard S. Bean**
 H.S.Bl. **Harold S. Black**



H.A.B. **Horace A. Barker**
 H.A.Be. **Hans A. Bethe**
 H.A.F. **Henry A. Fairbank**
 H.A.L. **Herbert A. Laitinen**
 H.A.R. **Herman A. Rediess**
 H.A.S. **Harvey A. Sternback**
 H.A.W. **Harley Z. Wilhelm**
 H.B. **Hans Brintzinger**
 H.Br. **Harold Brown**
 H.B.A. **H. Burnham Allport**
 H.B.F. **Howard B. Fell**
 H.B.G. **H. Bentley Glass**
 H.B.H. **H. B. Huntington**
 H.B.J. **Howard B. Jensen**
 H.B.M. **Harold B. Maynard**
 H.B.Mi. **Harlow B. Mills**
 H.B.S. **Howard B. Sprague**
 H.B.T. **Harold B. Tukey**
 H.B.W. **Harry B. Whittington**
 H.B.Wi. **Homer B. Willis**
 H.C. **Henry Charnock**
 H.Cl. **Hartwig Cleve**
 H.Cr. **Howard Crum**
 H.Cu. **Harold Cummins**
 H.C.B. **Herbert C. Brown**
 H.C.C. **H. C. Casey, Jr.**
 H.C.Co. **Herbert C. Corben**
 H.C.R. **Harold C. Ries**
 H.C.Ri. **Harold C. Riggs**
 H.C.S. **H. C. Schutt**
 H.C.W. **Harold C. Weber**

H.S.Br. **Harry S. Brigham**
H.S.H. **Helen S. Hogg**
H.S.I. **Herbert S. Isbin**
H.S.K. **Hugh S. Knowles**
H.S.L. **Harry S. Ladd**
H.S.La. **Hugh S. Landes**
H.S.M.C. **H. S. M. Coxeter**
H.S.P. **Harvey S. Price**
H.S.S. **H. Subak-Sharpe**
H.T. **Helen Tappan**
H.Ta. **Henry Taube**
H.T.H. **Henry T. Harrison**
H.T.Ha. **Hudson T. Hartman**
H.T.N. **H. Thomas Norris**
H.V. **Howard Vollum**
H.V.B. **Henry V. Borst**
H.V.B.K. **Hibberd V. B. Kline, Jr.**
H.V.C. **Homer V. Craig**
H.W. **Herbert Wells**
H.Wh. **Harry Wheeler**
H.Wi. **Hugh Wilcox**
H.Win. **Herman Winick**
H.W.B. **Horace W. Babcock**
H.W.Be. **H. Wayne Beatty**
H.W.Bl. **H. Weston Blaser**
H.W.Br. **Henry W. Brandli**
H.W.Bro. **Harold W. Brown**
H.W.C. **Howard W. Campbell**
H.W.F. **Henry W. Fischer**
H.W.K. **Harold W. Keller**
H.W.Ki. **Harold W. Kirby**
H.W.M. **Hans W. Meissner**
H.W.Me. **Henry W. Menard, Jr.**
H.W.Mo. **Harland W. Mossman**
H.W.O. **H. W. Oliver**
H.W.P. **Hermann W. Pfefferkorn**
H.W.Pi. **Hal W. Pilgrim**
H.W.R. **H. W. Ritchey**
H.W.Ru. **Howard W. Russell**
H.W.S. **Horace W. Stunkard**
H.W.W. **Howard W. Wainwright**
H.W.Wi. **Hazel W. Wilkinson**
H.W.Y. **Herbert W. Yankee**
H.Y.F. **Hsu Y. Fan**
H.Y.M. **Herbert Y. Meltzer**
H.Z. **Hubert Ziegler**
H.Zi. **Harold Zirin**

I.A.B. **Irving A. Breger**
I.A.L. **I. A. Lesk**
I.A.S. **Ivan A. Sellin**
I.B. **Ivan Barnes**
I.Ba. **Itzhak Bars**
I.Bl. **Ira Block**
I.D.A.J. **Ivan D. A. Johnston**
I.E.L. **I. E. Levine**
I.E.Li. **Irvin E. Liener**
I.E.O. **I. Edgar Odom**
I.F. **Irving Fox**
I.F.A. **Isabel F. Ahlgren**
I.F.K. **Isaac F. Kinnard**
I.G. **Isidore Gersh**
I.Gi. **Ian Gibbons**
I.Go. **Ivan Goodbody**

I.Gor. **Isabella Gordon**
I.H.G. **Irvin H. Gatzke**
I.J.G. **Irving J. Good**
I.K.F. **Irene K. Fischer**
I.K.S. **Ivan K. Schuller**
I.L. **Irving Laskowitz**
I.Le. **Ilee Lehieste**
I.L.K. **Irving L. Kosow**
I.L.T. **Ivan L. Tyler**
I.M.B. **I. M. Bernstein**
I.M.L. **I. Michael Lerner**
I.M.T. **Ian M. Tattersall**
I.N.L. **Ira N. Levine**
I.P. **Igor Paul**
I.P.K. **Ivan P. Kaminow**
I.P.T. **Irwin P. Ting**
I.R. **Irvin Rock**
I.S. **Irving Sheft**
I.St. **Isles Strachan**
I.S.G. **Irving S. Goldstein**
I.Z. **Israel Zelitch**
I.Zi. **I. Zlotnik**

J.A. **Jaime Amorocho**
J.As. **James Aston**
J.A.B. **J. A. Bolt**
J.A.Br. **Joseph A. Brink, Jr.**
J.A.C. **Joseph A. Cestone**
J.A.Cl. **John A. Clements**
J.A.D. **James A. Donaldson**
J.A.H. **John A. Harvey**
J.A.Hr. **John A. Hrones**
J.A.Hy. **J. Allen Hynek**
J.A.L. **James A. Lane**
J.A.M. **John A. Mason**
J.A.McG. **John A. McGinley**
J.A.N. **James A. Noble**
J.A.O. **John A. Osterman**
J.A.P. **Joseph A. Pask**
J.A.Ph. **James A. Phillips**
J.A.S. **J. Allen Scott**
J.A.Sh. **John A. Shellenberger**
J.A.Si. **Jack A. Simon**
J.A.Sm. **John A. Smith**
J.A.Sw. **John A. Swets**
J.A.W. **John A. Wheeler**
J.A.Wr. **James A. Wright**
J.B. **Jack Bass**
J.Be. **Jesse Beams**
J.Bi. **Joseph Bicknell**
J.Bid. **Jesse Bidanset**
J.Big. **Jacob Bigeleisen**
J.B.B. **J. Bruce Beckwith**
J.B.C. **J. B. Cheatham, Jr.**
J.B.E. **James B. Evans**
J.B.F. **Jack B. Fisher**
J.B.Fr. **J. Bruce French**
J.B.H. **Jacques B. Hadler**
J.B.Ha. **Jeffrey B. Harborne**
J.B.He. **John B. Hersey**
J.B.J. **J. B. Jennings**
J.B.K. **J. B. Ketterson**
J.B.L. **James B. Lackey**
J.B.Lo. **Joseph B. Long**

J.B.P. **Jon B. Pangborn**
J.B.Po. **James B. Pollack**
J.B.S. **John B. Scalzi**
J.B.T. **Joyce B. Turner**
J.B.V.S. **John B. Vander Sande**
J.B.W. **John B. Woodward**
J.C. **Joseph Callaway**
J.Ca. **John Catchpole**
J.Ch. **James Christensen**
J.Cha. **Julia Chase**
J.Cl. **John Clarke**
J.Co. **Jerome Cohen**
J.C.B. **John C. Brandt**
J.C.C. **John C. Couch**
J.C.D. **John C. Drake**
J.C.F. **John C. Ferm**
J.C.G. **Jeffery C. Gibeling**
J.C.L. **John C. Lane**
J.C.M. **Julian C. Miller**
J.C.Mo. **John C. Moore**
J.C.N. **John C. Niedermair**
J.C.O. **J. C. Overley**
J.C.P. **John C. Polking**
J.C.R. **John C. Reilly, Jr.**
J.C.Ri. **J. C. Ritchie**
J.C.S. **John C. Schelleng**
J.C.Sm. **Julian C. Smith**
J.C.Sp. **John C. Spindler**
J.C.W. **James C. Warf**
J.C.Wy. **James C. Wyant**
J.D. **Jack Davis**
J.D.A. **John D. Anderson**
J.D.B. **J. D. Bjorken**
J.D.Br. **John D. Briggs**
J.D.Bu. **James D. Burke**
J.D.C. **J. Donald Capra**
J.D.Co. **James D. Cobine**
J.D.G. **J. D. Gannon**
J.D.H. **J. Donald Harris**
J.D.He. **Julius D. Heldman**
J.D.J. **James D. Johnston**
J.DeL. **Jules de Launay**
J.D.M. **J. Derral Mulholland**
J.D.R. **James D. Reilly**
J.D.Ro. **J. David Robertson**
J.D.S. **James D. Schoeffler**
J.D.Si. **John D. Singleton**
J.E. **John Ehrlich**
J.Ei. **John Einset**
J.Ev. **John Everetts, Jr.**
J.Ew. **John Ewing**
J.E.A. **James E. Anders, Sr.**
J.E.B. **James E. Bayfield**
J.E.Bi. **John E. Biegel**
J.E.Bl. **John E. Blair**
J.E.Bla. **James E. Blankenship**
J.E.G. **John E. Gibson**
J.E.Gr. **Jonathan E. Grindlay**
J.E.Gu. **James E. Gunkel**
J.E.H. **John E. Haines**
J.E.Ho. **J. Edgar Hoover**
J.E.J. **J. Egil Juliusen**
J.E.L. **John E. Lamar**
J.E.Lo. **James E. Loughlin**
J.E.M. **Joseph E. Marian**
J.E.Ma. **James E. May**
J.E.McC. **John E. McCarty**
J.E.McD. **Joseph E. McDade**
J.E.O'L. **John E. O'Leary**
J.E.R. **Johannes E. Rijnsdorp**

J.E.S.	James E. Schindler	J.H.J.	J. Harlan Johnson	J.L.Re.	Joseph L. Reid
J.E.Sc.	John E. Scott, Jr.	J.H.L.	Jean H. Langenheim	J.L.S.	J. Lowen Shearer
J.E.St.	John E. Stevens	J.H.Lo.	John H. Lochhead	J.L.St.	Jacob L. Stokes
J.E.U.	John E. Ullmann	J.H.M.	John H. Miller	J.L.Str.	Jack L. Strominger
J.E.W.	John E. Ward	J.H.McL.	John H. McLeod, Jr.	J.L.T.	J. L. Turk
J.E.We.	J. E. Webb	J.H.N.	John H. Nair	J.L.T.W.	John L. T. Waugh
J.E.Wi.	Judith E. Winston	J.H.Ne.	James H. Nelson	J.L.W.	Joseph L. Walsh
J.E.Wo.	James E. Woodall	J.H.O.	John H. Ostrom	J.L.We.	James L. Weaver
J.F.	Jerry Feldman	J.H.S.	James H. Schulman	J.L.Wi.	James L. Wilson
J.F.B.	Joseph F. Bunnett	J.H.St.	John H. Silliker	J.L.Wr.	John L. Wray
J.F.C.	James F. Connors	J.H.T.	J. Herbert Taylor	J.M.	John Maisey
J.F.Cr.	James F. Crow	J.H.Ta.	Joseph H. Taylor, Jr.	J.Ma.	Jack Major
J.F.D.	John F. Dewey	J.H.W.	J. H. Walker	J.Mar.	John Markus
J.F.Di.	J. F. Dillon, Jr.	J.H.We.	James H. Webber	J.Mau.	John Mauchline
J.F.E.	John F. Endicott	J.H.Z.	John H. Zifcak	J.Me.	Jane Meiklejohn
J.F.F.	James F. Ferry	J.I.K.	Joseph I. Karash	J.Mei.	Jerome Meisel
J.F.H.	John F. Hahn	J.I.Y.	John I. Yellott	J.Mein.	J. Meinwald
J.F.J.	Julian F. Johnson	J.J.	Jules Janick	J.Meix.	Josef Meixner
J.F.Ja.	John F. Jarvis	J.J.B.	John J. Bleiweis	J.Men.	Joshua Menkes
J.F.L.	J. F. Loneragan	J.J.C.	Jeffrey J. Clarke	J.Mes.	John Meszar
J.F.M.	José F. Maldonado	J.J.Ca.	James J. Carberry	J.Mi.	Jacob Millman
J.F.Me.	John F. Meyer	J.J.Co.	Joseph J. Cornish, III	J.M.A.D.	J. M. A. Danby
J.F.Mo.	J. F. Moser, Jr.	J.J.F.	J. J. Fawcett	J.M.B.	John M. Bird
J.F.McM.	John F. McMahon	J.J.H.	Joseph J. Horzepa	J.M.Bo.	James M. Bobbitt
J.F.McP.	Joseph F. McPartland	J.J.Hr.	J. J. Hromadik	J.M.C.	John M. Carroll
J.F.R.	John F. Reintjes	J.J.J.	Julian J. Jaffe	J.M.Ch.	John M. Christie
J.F.S.	James F. Scott	J.J.K.	Joseph J. Katz	J.M.D.	James M. Daniels
J.F.Se.	Joseph F. Sebald	J.J.L.	J. J. Lagowski	J.M.Di.	James M. Dille
J.F.W.	John F. Wallace	J.J.M.	Joseph J. Moder	J.-M.F.	Jean-Marie Franc
J.F.We.	Jonathan F. Weil	J.J.Ma.	John J. Marcholonis	J.Mi.F.	J. Michael Fritsch
J.F.Wo.	J. F. Worley	J.J.McD.	John J. McDonald	J.M.H.	John M. Huns
J.G.	John Garcia	J.J.McK.	John J. McKetta	J.M.K.	John M. Kays
J.Ge.	John Gergely	J.J.R.	James J. Ryan	J.M.Ke.	Joseph M. Keller
J.Go.	Joseph Golden	J.J.S.	John J. Schule, Jr.	J.M.Ky.	John M. Kyle
J.Gr.	Jerry Grey	J.J.Sh.	J. J. Sheehan	J.McK.	James McKenzie
J.G.B.	James G. Blencoe	J.K.	Jan Klein	J.M.L.	Jack M. Linthicum
J.G.C.	J. G. Carter	J.K.B.	J. Kelly Beatty	J.M.M.	James M. Manning
J.G.E.	J. Gordon Elder	J.K.F.	Jacob K. Frenkel	J.M.Mi.	J. Murrar Mitchell, Jr.
J.G.F.	J. G. Futral	J.K.G.	John K. Galt	J.M.Mit.	J. M. Mitchison
J.G.G.	Joseph G. Gail	J.K.H.	Jack K. Holmes	J.M.McK.	James M. McKenzie
J.G.H.	James G. Horsfall	J.K.L.	James K. Lewis	J.M.O.	Jane M. Oppenheimer
J.G.J.	James G. Johnson	J.K.-M.	June Kan-Mitchell	J.M.P.	Jay M. Pasachoff
J.G.L.	John G. Liou	J.K.M.P.	John K. M. Pryke	J.M.S.	Jay M. Savage
J.G.M.	John G. Malm	J.K.R.	J. K. Roberts	J.M.T.	John M. Teal
J.G.Ma.	John G. Maisey	J.K.S.	James K. Skillling	J.M.To.	Julian M. Tobias
J.G.P.	June G. Pattullo	J.K.T.	J. Kerry Thomas	J.M.W.	J. Marvin Weller
J.G.R.	Jerome G. Rozen, Jr.	J.L.	Joseph Lach	J.M.Wi.	Jack M. Williams
J.G.S.	James G. Speight	J.Le.	Jonathan Leiby	J.M.Wo.	John M. Woods
J.G.T.	John G. Trump	J.Lei.	Joseph Lein	J.M.Wor.	John M. Woram
J.G.Tr.	John G. Truxal	J.Lu.	James Lucas	J.N.	Jerome Namias
J.G.W.	J. Guy Woodward	J.Ly.	John Lyman	J.N.B.	John N. Bahcall
J.H.	John Handin	J.L.B.	J. Laurens Barnard	J.N.C.	John N. Couch
J.Ha.	John Hansen	J.L.Bl.	J. Lewis Blackburn	J.N.L.	James N. Little
J.Har.	J. Harris	J.L.D.	Joseph L. Doob	J.N.Lu.	James N. Luthin
J.Hart.	Jack Hartstein	J.L.G.	John L. Gardiner	J.O.B.	J. Oscar Blew, Jr.
J.Hu.	Jack Huebler	J.L.Gr.	Jesse L. Greenstein	J.O.C.	John O. Corliss
J.H.B.	J. Harlan Bretz	J.L.Gro.	Jonathan L. Gross	J.O.Cu.	Joseph O. Culbertson
J.H.Bu.	John H. Busser	J.L.G.F.P.	James L. G. FitzPatrick	J.O.E.	John O. Edwards
J.H.C.	Joseph H. Camin	J.L.H.	J. L. Harley	J.O.H.	J. O. Hirschfelder
J.H.Ca.	James H. Calderwood	J.L.J.	Julian L. Jenkins	J.O.K.	John O. Kraehenbuehl
J.H.Cl.	J. Harold Clarke	J.L.K.	J. Laurence Kulp	J.O.S.	J. O. Scanlan
J.H.Cla.	John H. Clarke	J.L.Ka.	Jack L. Katz	J.P.	John Polking
J.H.Ca.	J. H. Collins	J.L.L.	Jack L. Lambert	J.Pe.	Jeff Perkins
J.H.C.	John H. Crowe	J.L.La.	J. L. Larimer	J.Po.	John Postgate
J.H.D.	John H. Davis	J.L.Lo.	John L. Loeb	J.P.D.H.	J. P. Den Hartog
J.H.F.	J. Homer Ferguson	J.L.M.	John L. Margrave	J.P.F.	J. Paul Fitzsimmons
J.H.Fi.	Joseph H. Field	J.L.Me.	Joseph L. Melnick	J.P.Fr.	Jeremiah P. Freeman
J.H.H.	Joseph H. Hamilton	J.L.McG.	James L. McGaugh	J.P.G.	Joseph P. Gerrity
J.H.Ha.	John H. Harley	J.L.McH.	J. L. McHugh	J.P.Go.	J. P. Gordon
J.H.Hi.	Joel H. Hildebrand	J.L.R.	James L. Rau	J.P.H.	John P. Hagen