

BIBLIOGRAPHY FOR  
SCIENCE TEACHERS

A thesis written in partial fulfilment  
of the requirements for the  
degree of Master of Arts.

Rory K. Y. Chau,  
St. Mary's University,  
School of Education,  
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Yusufi University of St. Mary's

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## PREFACE

In this study I propose to give an annotated bibliography of the books available in the Physical Sciences and in the Science of Mathematics in the Halifax Area. It is not intended to produce an annotated bibliography of the books dealing with all branches of the Physical Sciences and the Science of Mathematics; but rather of those books that would be of interest and importance to teachers in the Secondary School level.

The bibliography will include the five great divisions of Physical Science, such as: Astronomy, Physics, Chemistry, Geology and Biology; and the Science of Mathematics.

The primary aim of this bibliography is devoted to the historical development, aims, principles, philosophical aspects, methodological aspects, materials for instruction and the aids in teaching on the subject matter of the Physical Science and Science of Mathematics. It also includes the biography of some of the most prominent scientists, consequently the bibliography excludes

those books which are tertual in context.

The significant purpose of this study is to direct the secondary teachers to a better understanding of the books available to them for their professional use.

This compilation is arranged in alphabetical order according to the names of the authors. Only the books in Saint Mary's University Library are catalogued in this study.

I wish to thank Rev. Daniel Fogarty, S. J. for his advice, aid and incessant encouragement. I also wish to express sincere thanks to the librarians and their assistants of the various libraries in the Halifax Area, who have given ample help to this work, without their kind cooperation this study would not have been possible.

A Scientific American Book. The Physics and Chemistry of Life. New York: Simon and Schuster, Inc., 1955. 270 p.  
574.19  
S416

This book is about life as a physical process. The questions raised here are the kind that can be answered wholly within the disciplines that explain the behavior of non-living atoms and molecules.

A Scientific American Book. The Planet Earth. New York: Simon and Schuster, Inc., 1957.  
551  
S416  
168 p.

This is a book about the planet that we know best - the core, crust, oceans and atmosphere. It presents a comprehensive picture of what we know now, and it will be able to answer a great many fundamental and practical questions about the earth's interior and crust, and about its waters, its atmosphere and its nearly cosmic environment.

Abetti, Giorgio. The History of Astronomy. New York: Henry Schuman, Inc., Publishers, 1952. 338 p.  
520.9  
A147

A history from primeval times to the present, containing anecdotes about many famous astronomers.

Achelis, Elisabeth. Of Time and the Calendar. New York: Hermitage House, Inc., 1955. 132 p.  
529.3  
A177

An argument for the proposed World Calendar. There is a history of lunar and solar calendars, from Egypt, Rome and through the ages the influence of the ancient Egyptian and Jewish calendars: the Mohammedan, Russian and Indian calendars. Then follows a survey of the efforts to equalize and balance the calendars, the agitation for a thirteen-month year and the growing support of a solar calendar of twelve.

Adler, Irving. The Tools of Science. New York: The John Day Company, 1958. 128 p.

The author discusses scientific apparatus and instruments ranging from small simple devices as the pendulum to complex machines such as syclotron explaining the basic principles of each.

Bakst, Aaron. Mathematical Puzzles and Pastimes. New York: D. Van Nostrand Company, Inc., 1954. 206 p.

The aim of this book is to dispel the idea that mathematics cannot be relaxing. This volume presents a systematic discussion of various mathematical recreations with the aim of developing and systematizing the methods for the solution and treatment of recreational material.

Bank, J. Houston. Learning and Teaching Arithmetic. Boston: Allyn and Bacon, Inc., 1959. 405 p.

Chapters 2, 4, 6, 8, and 10 are devoted to the development of greater insights into elementary arithmetic. Following each of these chapters, there is a chapter devoted to the teaching of the same aspect of arithmetic to elementary school children.

Barber, Harry C. Teaching Junior High School Mathematics. New York: Houghton Mufflin Company, 1924. 136 p.

This volume attempts to tell simply and clearly just what is meant by 'New Mathematics', what it is, why it is desirable, and how it may be successfully taught.

Barnett, Lincoln Kinnear. The Universe and Dr. Einstein. New York: William Sloane, Associates Inc., 1948. 127 p.  
530.1  
B261

Brief biography of Dr. Einstein and the main ideas of theory of relativity.

Battista, O. A. God's World and You. Milwaukee: The Bruce Publishing Company, 1957. 229 p.  
500  
B336

This book is written for reading pleasure, but also to help people retain a moral and christian perspective regarding the role and significance of knowledge.

Beet, Ernest A. Teaching Astronomy in the Schools. London: Cambridge University Press, 1956. 71 p.  
520.7  
B415

A concise guide to syllabi, equipment, classroom work, outdoor practical work, and teaching aids of astronomy.

Bell, Eric Temple. Mathematics, Queen and Servant of Science. New York: McGraw-Hill Book Company, Inc., 1951. 437 p.  
510.9  
B433

The author has succeeded in relating mathematics to other sciences. Moreover, he has explained such abstruse mathematical concepts as matrices so they can be grasped by non-mathematical minds.

Berrill, N. J. Sex and the Nature of Things. New York: Dodd, Mead & Company, 1953. 256 p.

An account of the relationship between sex and reproduction, and the part played by sex in the evolution and development of the living world. In this investigation of a complex subject, the author is concerned primarily with the lesser forms of life rather than with human beings.

Bethe, Hans Albrecht. Elementary Nuclear Theory. New York: John Wiley & Sons, Inc., 1947.

539.7  
B562

147 p.

The emphasis in the book is placed on the problem of nuclear forces, and the author treats this problem entirely from the empirical point of view.

Bischof, George P. Atoms at Work. New York: Harcourt, Brace and Company, 1951. 130 p.

The author explains the basic principles of atomic activity and tells how they have been discovered and developed.

Bolton, Sarah K. Famous Men of Science. New York: Thomas Y. Crowell Company, 1946. 308 p.

This is a collection of biographies of some of the world's outstanding scientists since Copernicus. What they gave to the world is described in non-scientific terms. Their personal lives are related in an anecdotal style. What kind of men they were, how they lived, how they worked and what they accomplished.

Bonola, Roberto. Non-Euclidean Geometry. New York: Dover Publications, Inc., 1955. 268 p.

513.8  
B719

This book is devoted to a fuller treatment of the history of parallels, and to the historical development of the geometries of Lobachevshy-Bolyai and Riemann.

Boyer, Lee Emerson. An Introduction to Mathematics for Teachers. New York: Henry Holt and Company. 1945. 478 p.

The purpose of this book is to provide prospective elementary and secondary school teachers with some means of learning about the nature, significance and use of mathematics from early times to the present.

Bragg, Sir William Henry. Concerning the Nature of Things. New York: Harper & Brothers, Publishers, 1925. 249 p.

548  
B813

The author gives a thorough understanding of the atom itself, and the increasingly complex molecular forms exhibited by liquids, gases and crystals.

Brandwein, Paul F. Teaching High School Science. New York: Harcourt, Brace and Company, 1958. 568 p.

This is a book of methods of teaching high school science. The book is presented in the hope that it may help to point the way toward better instruction in science.

Breslich, Ernest R. The Teaching of Mathematics in Secondary Schools. Chicago, Illinois: The University of Chicago Press, 1930. 239 p.

The volume is the first part of a series of books on the teaching of mathematics in the secondary schools. Volume 1 has been prepared to serve the following purposes: (1) To help the reader deal intelligently with problems relating to the technique of teaching mathematics. (2) To outline effective procedures and devices to be used in teaching mathematics. (3) To discuss the problem of class management. (4) To suggest how pupils may be taught to study. (5) To discuss the general and specific objectives of secondary mathematics and the general objectives of secondary education.

Breslich, Ernest R. Problems in Teaching Secondary-School Mathematics. Chicago, Illinois: The University of Chicago Press, 1940. 348 p.

The aim of this volume is to discuss specific problems which arise in the teaching of instructional materials and in the development of the mathematical concepts, principles, processes, and skills.

Brown, G. I. A Simple Guide to Modern Valency Theory. London: Longmans, Green and Co., 1957. 174 p.

The aim of this book has been to give a general account of modern valency theory which will help towards the understanding of chemistry as a whole.

Burch, Cecil. Short Cuts and By-ways in Arithmetic. London: Blackie and Son Limited, (n.d.) 107 p.

The author aims not only to point out sundry short cuts and by-ways of arithmetic, but also to show how these short cuts have been made possible.

Burnett, R. Will. Teaching Science in the Secondary School. New York: Rinehart & Company, Inc., 1957. 382 p.

The aim of this book is to present the theory and practice of science teaching on the secondary school level in an integrated fashion in order to help to develop both the theoretical insight and the practical knowledge and skill for high achievement in science teaching.

Batler, Charles Henry, and Wren, F. L. The Teaching of Secondary Mathematics. New York: McGraw-Hill Book Company, Inc., 1951. 550 p.

This book consists of three main parts: (1) The place and function of mathematics in secondary education. (2) The improvement and evaluation of instruction in secondary mathematics. (3) The teaching of the special matter of secondary mathematics.

Cajori, Florian. A History of Elementary Mathematics. New York: The Macmillan Company, 1953. 516 p.

510.9  
C139

A history of mathematics from Babylonian times to the present.

Campbell, Norman Robert. Foundations of Science. New York: Dover Publications, Inc., 1957. 565 p.

'Foundations of Science' is divided into two parts. The first part analyzes the presuppositions upon which scientific thought is based. It treats the subject matter of Science, theories, chance and probability. Science and philosophy are also discussed and the physical nature of the world is studied in relation to problems suggested by mechanics, thermodynamics, gas theory, and electrical phenomena. In the second part the author covers the nature of experiment and the application of mathematics. Measurement, magnitude, fractional and negative, units and dimensions and error of measurement are all discussed and considered.

Campbell, Norman Robert. What is Science? New York: Dover Publications, Inc., 1952. 186 p.

This book is an introduction to the nature and method of scientific thought. It explains clearly the role of experiment and measurement, the role of mathematics, and sets forth various kinds of scientific laws and points out the difference between law and theory.

Carson, Rachel Louise. The Sea Around Us. Toronto: Oxford University Press, 1951. 230 p.

551.46  
C321

Based on geological evidence, this book is a study of the processes that formed the earth, the moon, and the oceans. The part played by the wind, sun and the rotation of the earth in making of the tides and their importance in regulating climate is also described.

Child, Ernest. The Tools of the Chemist. New York: Reinhold Publishing Corporation, 1940. 220 p.

The author's effort primarily concerns the events and those whose work played a significant part in the creation and development of chemical laboratories and apparatus in America.

Clapp, Leallyn Burr. Chemistry of the Covalent Bond. San Francisco: W. H. Freeman & Company, Publishers, 1957. 684 p.

541  
C589

The emphasis is on the structure and valence. A wide range of reactions, both inorganic and organic, is covered and each one is diagramed. No mathematics is employed in the exposition.

Cohen, I. Bernard. Franklin and Newton. Philadelphia:  
The America Philosophical Society, 1956.  
530.903 657 p.  
C678

An inquiry into speculative  
Newtonian experimental science and  
Franklin's work in electricity.

Cohen, I. Bernard. Science, Servant of Man. Boston:  
Little, Brown and Company, 1948. 362 p.

This book attempts to study the  
practical consequence of scientific  
research by means of selected case  
histories.

Colton, Bael P. Zoology. Boston: D. S. Heath &  
Co., Publishers, 1903. 204 p.

590  
C725

The aim of this book is to present  
a fairly complete picture of the life of  
each of the large groups of animals in its  
place of living; its manner of securing  
food; its enemies and its means of  
protection; its mode of locomotion; the  
processes of digestion, circulation and  
respiration; its sense organs, its  
development; its relations to the plant  
world, to other animals and to man.

Comstock, Anna Botsford. Handbook of Nature-Study.  
Ithaca, New York: Comstock Publishing  
Associates, 1959. 937 p.

The chief aim of this volume is  
to encourage investigation rather than  
just to give information. The book is  
divided into four parts: Part I - The  
Teaching of Nature-Study; Part II - The  
Animals; Part III - Plants; Part IV -  
Earth and Sky.

Conant, James Bryant. Science and Common Sense.  
 New Haven: Yale University Press, 1951.  
 371 p.  
 507.2  
 C743

Here in a volume dealing with the techniques and approach of experimental science, Dr. Conant puts his proposal into effect. Through the case history method, that is the examination of outstanding advances in the early history of science, he endeavors to provide the intelligent citizen with an appreciation of what science can accomplish and of the point of views of the laboratory scientist.

Courant, Richard and Robbins, Herbert. What is Mathematics. London: Oxford University Press, 1948. 514 p.  
 570  
 C858

High School Teachers may find helpful material for the clubs or selected groups of students in the chapters on geometrical constructions and on maxima and minima.

Curie, Eve. Madame Curie. Garden City, New York: Garden City Publishing Co., Inc., 1943. 395 p.

This is the biography of Madame Marie Curie, discoverer of radium, twice winner of the Nobel Prize, the greatest of all women scientists, whose work changed the course of the world thinking.

Dadonrain, H. M. How to Study - How to Solve. Cambridge, Mass.: Addison-Wesley Press, Inc., 1949. 41 p.  
 510.7  
 D121

It is the aim of this pamphlet to help the reader of mathematical science to remove the extraneous sources of difficulty. It is divided into two parts. In Part I, the conditions for effective study are discussed and a number of helpful suggestions are made. In Part II, general directions are given on how to solve problems as to increase the chances of success.

Dantzig, Tobias. Number, The Language of Science.  
Garden City, New York: Doubleday &  
Company, Inc., 1954. 345 p.  
510.1  
D638

Part I deals largely with concepts and ideas while Part II is on the implementation of these concepts and ideas but is mainly an integrated story of the development of method and argument in the field of number.

Darrow, Floyd L. Masters of Science and Invention.  
New York: Harcourt, Brace and Company,  
1923. 352 p.

A book about 50 leading scientists from Galileo to Einstein, in which each name is placed against the background of the ideas of his name. It shows the actual working out of the discovery with which his name is associated.

Darwin, Francis. The Autobiography of Charles Darwin. New York: Dover Publications, Inc., 1958. 365 p.

This book provides an analysis of the theory of evolution. It traces the development of this momentous idea in the autobiography, letters, and notebook excerpts of the man who gave it to the world.

Dietz, David. The Story of Science. New York: Sears Publishing Company, Inc., 1931. 353 p.

509  
D565

A unified and accurate exposition of the four great divisions of science: It begins with Astronomy - The Story of the Universe - telling what the astronomers have discovered about the heaven. It proceeds next to Physics and Chemistry - The Story of the Atom - a discussion of the molecule, the atom, and electron, the building blocks from which the entire universe is fashioned. The third part of the book is Geology - The Story of Earth. The fourth part is Biology - The Story of Life - from microscopic forms to man.

Downing, Elliot Rowland. Teaching Science in the Schools. Chicago, Illinois: The University of Chicago Press, 1925. 185 p.

The book is presented for teachers and deals with the history, aims, principles of organization, and methods of instruction in the several sciences.

Dryer, John Louis Emil. A History of Astronomy from Thales to Kepler. New York: Dover Publications, Inc., 1953. 438 p.

520.9  
D778

In this book an attempt has been made to trace the history of man's conception of the universe from the earliest historical ages to the completion of the Copernican system by Kepler in the seventeenth century.

Drimmer, Frederick. The Animal Kingdom. New York: Greystone Corporation Publishers, 1954.

B590  
D779

'Animal Kingdom' tells us clearly within the scope of comprehensive natural history, the things we want to know about the strange and wonderful ways of all - the mammals, birds, amphibians, reptiles, fishes, insects and other invertebrates of the entire world.

Eddington, Sir Arthur Stanley. The Philosophy of Physical Science. Cambridge: Cambridge University Press, 1938. 230 p.

530.1  
E21p

The intention of the book is to give, not merely an exposition, but a justification of the views to which the principles of relativity theory and quantum theory lead.

Fine, Henry B. The Number-System of Algebra. New York: G. E. Stechert & Co., 1937. 131 p.

The theoretical part of this book is an elementary exposition of the nature of the number concept, of the positive integer, and of the four artificial forms of number which, with the positive integer constitute the 'Number-System' of Algebra. The book also treats only a brief account of the origin and history of the artificial numbers.

Fitzpatrick, Frederick L., and Horton, Palph E. Biology. New York: Houghton Mifflin Company, 1940. 611 p.

The materials of the book have been arranged in seven units. Each unit deals with a specific fundamental principle of biology. The first unit serves as a general introduction. It includes a discussion of the changing environment. The second unit deals with the cell principle as exhibited by the structures of plants and animals. Physiology is the subject of the third unit. Adaptation of function and structure are discussed in the fourth unit. The fifth unit deals with reproduction in plants and animals. This is followed by a sixth unit on variation and heredity. The seventh unit has as its subject the consideration of other organisms in relationship to human welfare.

Frank, Joseph Otto. How to Teach General Science. Philadelphia: P. Blackiston's Son & Co., 1926. 240 p.

The chapters on content, methods and materials of instruction are filled with concrete and practical suggestions which are directly applicable to class room conditions.

Frank, Philipp G. Philosophy of Science. Englewood  
Cliff, N. J. Prentice-Hall Inc., 1957.

501  
F828p

This book attempts to start from the way in which science is understood by the scientist in his most creative and critical moods. It also attempts to establish a link with the historical types of philosophy like idealism and materialism that have actually served as support of moral, religious and political creeds.

Frank, Philipp G. Einstein - His Life and Times.  
New York: Alfred A. Knopf, Inc., 1947.  
298 p.

The author of this biography relates Einstein's work in physics to the world-wide development of the physical sciences. He has presented both the personal and the public aspects of Einstein's career.

French, Sidney J. The Drama of Chemistry. New York:  
The University Society Incorporated, 1937.  
170 p.

540.9  
F876

This book treats with 'How man deals with Atoms'.

Freuchan, Peter. The Arctic Year. London: G. P.  
Putnam's Sons, 1958. 428 p.

'The Arctic Year' tries to give an impression of how man, beasts and plants exist under arctic conditions, from January through spring, and on into the new long winter of cold and darkness.

Friend, John Albert. Numbers: Fun & Facts. New York: Charles Scribner's Sons, 1954. 208 p.

This book has one main object namely to show how interesting, indeed fascinating, is the study of numbers, their origin, and peculiarities, legends and superstitions that have, in the course of ages, collected around them.

Galilei, Galileo. Dialogues Concerning Two New Sciences. Evanston and Chicago: Northwestern University Press, 1939. 300 p.

This book contains practically all that Galileo has to say on the subject of Physics.

Garbedian, Haig Gordon. Thomas Alva Edison - Builder of Civilization. New York: Julian Messner; Inc. Publishers, 1947. 231 p.

A biography of Thomas Alva Edison. This book contains many anecdotes about the inventor's early life and the development of some of his many inventions.

Hall, Alfred Rupert. The Scientific Revolution. London: Longmans, Green, and Co., 1954. 390 p.

509  
H174

The emphasis of the book is on the new line of thought in the physical and biological sciences, and how these lines of thought originated in the minds of the outstanding figures of the period.

Harris, C. O. Slide Rule Simplified. Chicago: American Technical Society, 1946. 266 p.

The instructions are presented in a manner that recognizes the usual difficulties of the learner and overcomes them. The book gives the complete instruction on how to read the different slide rule scales accurately and precisely, and thus foretell serious errors.

Haynes, William. This Chemical Age. New York: Alfred A. Knopf, Inc., 1942. 381 p.

The book aims to present a good deal about what is probably the most significant and certainly the most fascinating development of our times: the production of man-made materials.

Heath, T. L. The Work of Archimedes. New York: Dover Publications, Inc., (n.d.) 326 p.

510.9  
A673

This book starts with a brief historical introduction, and goes on to a more general view of certain methods employed by Archimedes and of their mathematical significance.

Heiss, Elwood David, Obourn E. S., and Hoffman C. W. Modern Methods and Materials for Teaching Science. New York: The Macmillan Company, 1940. 351 p.

507  
H473

This book is divided into three sections. Section one is devoted to principles of science teaching. Section two is devoted to treatment of visual and other secondary aids useful to teaching science. Section three presents a compilation of sources of material useful in teaching science.

Hillcourt, William. Field Book of Nature Activities.  
New York: G. P. Putnam's Sons, 1950.  
320 p.

The book contains instructions for watching wild-life in the field and for bringing nature into home, camp, garden or classroom. It covers hundreds of specific suggestions for projects - things to do and things to make - in the field of nature.

Hoff, Arthur Gerhard. Secondary-School Science Teaching. Toronto: The Blakiston Company, 1947. 303p.

The intention of this book is to give guidance on the total area of teaching to the science teacher. It attempts to present in detail a plan for unit teaching and subsequently treats other plan more briefly.

Hood, Peter. How Time is Measured. London: Oxford University Press, 1955. 64 p.

'How Time is Measured' is an account of various ways of time keeping from early times up to the most up-to-date electronic time keepers. Clocks, their history and mechanism are fully described and illustrated.

Hooper, Alfred. Makers of Mathematics. New York: Modern Library, Inc., 1958. 402 p.

510.9  
H785

The story of those who laid the foundations of modern mathematics and which, at the same time, explains as simply as possible the outstanding landmarks and details of the various mathematical concepts and processes developed by them; concepts and processes which are, in the main, based on surprisingly familiar everyday life.

Hull, Lewis William H. History and Philosophy of Science. London: Longmans, Green and Co., 1959. 340 p.

509  
H913

This book tries to bridge the gap between science and the humanities by considering scientific ideas in a context of history and philosophy.

Infeld, Leopold. Albert Einstein. London: Charles Scribner's Sons, Ltd., 1950. 127 p.

A condensed explanation of Einstein's quantum theory and theory of relativity and his contributions to Physics.

Jennings, Herbert Spencer. The Biological Basis of Human Nature. New York: W. W. Norton & Company, Inc., publishers, 1930. 384 p.

This volume is an attempt to present those aspects of modern experimental biology that are of most interest in considering the problem of human personality and society. It deals with the origin, development and nature of the traits which distinguish individuals and which in man make up character; and with some of the relations of those matters to social questions.

Johnson, Frank Harris. The Kinetic Basis of Molecular Biology. New York: John Wiley & Sons, Inc., 1954. 874 p.

This book demands on the part of the reader enough mathematical maturity to grasp the main ideas of quantum mechanics and statistical mechanics.

Jones, Burton Wadsworth. The Theory of Number. New York: Rinehart & Company, Inc., 1955. 143 p.

The first three chapters are rich in material useful for the secondary and elementary school teacher.

Jones, Samuel I. Mathematical Wrinkles. Nashville, Tenn.: Samuel I. Jones, Publisher, 1929. 361 p.

This book contains many mathematical problems, puzzles, and amusements of past and present times. It is intended to be a helpful companion to teachers, and to impart to students a knowledge of the application of mathematical principles, which, one cannot obtain from text books.

Kemeny, John George. A Philosopher Looks at Science. Princeton, New Jersey: D. Van Nostrand Company, Inc., 1959. 273 p.

501  
K31

In this book the author gives essay treatment to such broad areas as; language, mathematics, assumptions and probability, the scientific method, concepts of science and scientific explanations, determinism, the nature of life and the mind, and the status of values and value statements.

Kendall, James. Michael Faraday, Man of Simplicity. Farber and Faber, Ltd., 1955. 196 p.

A short biography of a blacksmith's son, who, from a bookbinder's apprentice, came to be one of the leading scientists of Victorian England.

Kinney, Lucien Blair, and Purdy, C. R. Teaching Mathematics in the Secondary School. New York: Rinehart & Company, Inc., 1952. 381 p.

This book would be a valuable reference and inspiration for both prospective and practicing teachers of mathematics. The book repeatedly shows that application of the principles of educational psychology can make the learning situation enjoyable as well as fruitful.

Klein, Felix. Elementary Mathematics. New York: Dover Publications, Inc., 1924. 274 p.

510  
K64

This book is concerned with development in the subject matter of instruction.

Kline, Morris. Mathematics in Western Culture. New York: Oxford University Press, 1953. 484 p.

The ideas of this book are presented in historical order beginning with ancient Egyptian and Babylonian concepts and bringing the story down to the modern theory of relativity.

Lane, Ferdinand Cole. Earth's Grandest Rivers. New York: Doubleday & Company, Inc., 1949. 305 p.

551.48  
L265

A brief but concise description of the world's grandest rivers. Supplementary chapters deal with rivers in general, and their influence on human life and history.

Laver, Frederick John M. Electric Power. London: Oxford University Press, 1957. 80 p.

The object of this book is to present a straight forward introduction to the electrical and magnetic effects that are important in studying technical electricity.

Laver, Frederick John M. Electrons at Work. London: Oxford University Press, 1957. 78 p.

This book is about the use of electricity for 'tele-communications and electronics'.

Leach, Herbert W., and Beakley George. The Slide Rule. New York: The Macmillan Company, 1953. 44 p.  
510.78  
L434

The instructions given are applicable to most form of rules, and special topics are included to describe the use of Mannheim and Log-log type rules.

Leicester, Henry M. The Historical Background of Chemistry. New York: John Wiley & Sons, Inc., 1956. 260 p.

The author attempts to follow the development of chemistry through the thoughts and ideas of chemists rather than through the details of their lives. The author places the main emphasis on the development and interrelation of chemical concepts.

Ligda, Paul. The Teaching of Elementary Algebra. New York: Houghton Mifflin Company, 1925. 256 p.

The author proposes to discuss the following fundamental topics: (1) Lack of proper motivation. (2) The induction method. (3) Relationships. (4) The use of function concept in unifying the subject. (5) Fundamentals and (6) The characteristic formula.

Littlewood, Dudley E. The Skeleton Key of Mathematics. London: Hutchinsons' University Library, 1957. 138 p.

The book deals with the kind of algebra used by modern physics. It is a concise account of mathematical analysis and the theory of numbers, equations, Tensors, matrices, groups and group characters.

Love, Lawrence Francis C. Problems in Engineering Science. London: Edward Arnold (Publishers) Ltd., 1958. 173 p.  
510  
L879

This book contains a minimum of basic theory of engineering science and a great numbers of worked examples in each section.

Manufacturing Chemists' Association. Chemical Laboratories - Safety Measures. New York: D. Van Nostrand Company, Inc., 1954. 234 p.  
542.1  
M294

A guide for safety in a chemical laboratory.

Maxwell, Edwin Arthur. Fallacies in Mathematics. Cambridge: Cambridge University Press, 1959. 95 p.

The aim of this book is to present references to the sources of the fallacies and also to instruct through entertainment.

May, Kenneth Ownsworth. Elements of Modern Mathematics. Reading, Mass.: Addison-Wesley Company, Inc., 1959. 607 p.  
510  
M466

Some significant points of this book are: (1) The symbolism of logic and set theory is presented and used throughout the book. (2) A simple notation indicating substitution for variables in formulas is adopted. (3) Applications are to a very wide field in the humanities, arts, biology, and social sciences, as well as to the physical sciences and engineering.

Meserve, Bruce Elwyn. Fundamental Concepts of Algebra. Cambridge, Mass.: Addison-Wesley Publishing Company, Inc., 1953. 294 p.

512  
M578

This book adopts a modern viewpoint of algebra and analysis with relation to elementary mathematics.

Minneart, Marcellus. The Nature of Light and Colour in the Open Air. New York: Dover Publications, Inc., 1954. 362 p.

535  
M665

Why is falling snow sometimes black? What causes mirages, the fata morgana, multiple suns and moons in the sky? How are shadows formed? Professor Minneart answers these and similar questions in optics, light and colour for non-specialists.

Moore, Forris J., and Hall, William T. A History of Chemistry. New York: McGraw-Hill Book Company, Inc., 1931. 324 p.

540.9  
M821

This book deals in a direct way with the fundamental ideas of the science; their origin, their philosophical basis, the critical periods of their development, and the personalities of the great men whose efforts have contributed to that development.

Moore, Patrick Alfred. Guide to the Planets. London: Eyre & Spottiswoode (Publishers) Ltd., 1955. 222 p.

523.2  
M823

The author adds to the origins, movements and composition of the planets, as science outlines them, some interesting speculation as to what kind of life might be possible on each and what problems man might encounter in visiting them.

Mordell, Louis J. Reflections of a Mathematician.  
 Montreal: Mathematical Congress, McGill  
 University, 1959. 50 p.

510-  
 M834

This booklet contains the author's ideas, views and opinions about mathematics and mathematicians.

More Louis Trenchard. Isaac Newton. New York:  
 Charles Scribner's Sons, Ltd., 1934.  
 678 p.

A biography of Isaac Newton.

Moulton, Forrest Ray, and Schifferes J. J. eds.  
The Autobiography of Science: New York:  
 Doubleday, Doran and Company, Inc., 1945.  
 666 p.

'The Autobiography of Science' is fundamentally an anthology of the key passages from the master works of all sciences. The selections are in general arranged in chronological sequence. This book will introduce the history of science, it will give first-handed, original account of the substance of great scientific thinking. It will suggest the sweep, scope and international brilliance of scientific development, and it will provide an account of accurate, intimate, living knowledge of the great men and women of science.

Newman, James R. What is Science? New York: Simon  
 and Schuster, Inc., 1955. 493 p.

504  
 N553

This is a symposium on science and the scientific outlook. Its emphasis is on the nature of scientific knowledge, scientific method, and science as an intellectual pursuit.

Newman, James R. The World of Mathematics. New York: Simon and Schuster, Inc., 1956. Volumes i, ii, iii, and iv.

A small library of the literature of mathematics from A'h-mou the scribe to Albert Einstein. The anthology covers the history of mathematics, pure mathematics, a variety of applications and many articles of incidental mathematical interest.

Nunn, Gordon. Handbook for Science Teachers in Secondary Schools. London: John Murray (Publishers) Ltd., 1951. 267 p.

This book is intended as a guide to the science teachers in a secondary modern school. It deals with materials such as: syllabus, method, laboratory facilities, and visual aids in science teaching.

O'Brien, Katharine E. Successful Devices in Teaching Algebra. Portland, Me.: J. Weston Walsh, Publisher, 1955. 150 p.  
512.07  
013

This book presents a compilation of sources of successful device and procedure useful in teaching algebra.

O'Brien, Katharine E. Successful Devices in Teaching Geometry. Portland, Me.: J. Weston Walsh, Publisher, 1955. 166 p.  
513.07  
013

This book presents a compilation of sources of successful device and procedure useful in teaching geometry.

Oparin, Aleksandr Ivanovich. The Origin of Life.

New York: Dover Publications, Inc.,  
1953. 270 p.

576  
061

A historical introduction which covers the theories on the origin of life from the Greek, through the middle ages and Renaissance, to modern times. Their basic theories are examined in light of modern knowledge. This is the first modern statement of the theory of gradual evolution of life from nitrocarbon compound.

O'Teale, George Barry. The Case against Evolution.

New York: The Macmillan Company, 1925.  
408 p.

575  
088

This book endeavors to show that evolution has long since degenerated into a dogma, which is believed in spite of the facts, and not on account of them. The first three chapters deal with the theory in general, discussing in turn its genetical, morphological, and geological aspects. The last three chapters are devoted to the problem of origins, and treat of genesis of life, of the human soul, and of the human body respectively.

Owen, C. Brewster. Method for Science Masters.

London: Macmillan & Co., Ltd., 1956.  
165 p.

The first aim of this book is to answer the question 'What is Science'? The second aim is to help young masters to plan their laboratories, to order their apparatus, and to work well.

Pearl, Richard M. How to Know the Minerals and Rocks. New York: McGraw-Hill Book Company, Inc., 1955. 192 p.

This book is a practical field guide to more than 125 of the most important minerals and rocks, including gems, ores, native metals, meteorites and other interesting members of the mineral kingdom.

Polya, G. How to Solve It. Princeton, New Jersey: Princeton University Press, 1957. 253 p.

Written simply and concisely, this study of methods of solving problems gives special attention to the requirements of students and teachers of mathematics. It deals with the procedures of the mind in searching for solutions of problems.

Poulton, Ethel M. The Teaching of Biology. London: Methuen & Co. Ltd., 1937. 244 p.

This book is designed for the teacher of elementary biology. It is divided into two sections. Part I deals with the general principles which should underlie the teaching of biology, and the general methods of teaching the subject. Part II is devoted to suggestions as to the mode of dealing with suitable topics.

Read, John. Through Alchemy to Chemistry. London: G. Bell and Sons, Ltd., 1957. 206 p.

540.1  
R283

This book describes how science developed, and what it is doing. Its object is to help people to understand the general implication of the new knowledge and the possibilities and powers that it brings.

Rice, Francis O, and Teller, Edward. The Structure of Matter. New York: John Wiley & Sons, Inc., 1949. 361 p.  
541.2  
R495

The purpose of this book is to acquaint the reader with the scope of the phenomena that can be explained with the help of quantum mechanics.

Richardson, John S. Science Teaching in Secondary Schools. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1958. 385 p.

The book is presented for teachers and deals with the history, aims, principles of organization, and methods of instruction in the several sciences.

Riedman, Sarah R. Men and Women behind the Atom. London and New York: Abelard-Schuman Limited, 1958. 228 p.

The author has presented to us a book about a number of the men and women who played a part in this world-shaking discovery. This book tells us their childhood, their family environment, and their development. The author also discusses the discoveries and research of all of them, carefully explaining all her scientific terms.

Roantree, William F. An Arithmetic for Teachers. New York: The Macmillan Company, 1952. 523 p.

There are two sections in this volume: (1) a book of information on various items to be taught in arithmetic - the teacher's knowledge of the subject. (2) A discussion of methods of presenting this knowledge to the students - the methodology of teaching arithmetic.

Romer, Alfred Sherwood. The Vertebrate Body. Philadelphia: W. B. Saunders Company, 1951. 643 p.

This book is designed to give, in brief form, a history of the vertebrate body. Basic will be a comparative study of vertebrate structures, the domain of comparative anatomy.

Routh, Joseph I. 20th Century Chemistry. Philadelphia: W. B. Saunders Company, 1950. 613 p.

540  
R869

Three major sections in the book present the fundamentals of inorganic, organic and biological chemistry.

Rowland, John. Mysteries of Science. London: T. Werner Laurie, Ltd., 1955. 214 p.

501  
R883

This is a study of the limitation of the scientific method. The author presents his concept of the position of modern science in present-day philosophy and indicates some of the problems which the scientist has not solved.

Rusk, Roger D. How to Teach Physics. Philadelphia: J. B. Lippincott Company, 1923. 186 p.

This book aims to give the teacher a working knowledge of the teaching of physics, by defining the aims and methods of the subject, by practical suggestions as to the subject matter, and particular reference to the developmental method of presenting the materials.

Sawyer, W. W. Mathematician's Delight. London: Penguin Books, Ltd., 1952. 238 p.

510  
S271

This book is designed to convince the general reader that mathematics is not a forbidding science but an attractive mental exercise. Mathematical methods are used to solve simple everyday problems.

Schaaf, William L. Basic Concepts of Elementary Mathematics. New York: John Wiley & Sons, Inc., Publishers, 1960. 386 p.

This book gives the reader a genuine insight into the true nature of mathematics as an intellectual discipline. Rather than show how to perform mathematical operations, the author has chosen to show why these operations work, why multiplication, for instance, produces the answers it does - and why these answers are correct.

Scheinfield, Amram. The New You and Heredity. New York: J. B. Lippincott Company, 1950. 616 p.

This book offers complete information on the topic of heredity. It tells us what our children can or cannot inherit and covers other pertinent relationships between this topic and society.

Schonell, Fred J., and Schonell, F. E. Diagnosis and Remedial Teaching in Arithmetic. London: Oliver and Boyd, Ltd., 1957. 198 p.

The primary purpose of this book is to assist teachers in the prevention, diagnosis, and remedying of pupil's difficulties in arithmetic.

Schroeder, W. Practical Astronomy. London: T. Werner Laurie, Ltd., 1956. 206 p.

520  
8381

The author tells the evolution of stars, their spectral types, the structures of the universe, and the surface details of the planets; and the more obvious happenings in the sky, such as movements of planets, the phases and the path of the moon, and all those phenomena associated with earth's daily rotation.

Schultze, Arthur. The Teaching of Mathematics in the Secondary Schools. New York: The Macmillan Company, 1919. 370 p.  
510.72  
S387

The chief object of this book is to contribute towards making mathematical teaching less informational and more disciplinary; and show how to train students in attacking mathematical problems instead of merely making them learn mathematical facts.

Science Masters' Association. Secondary Modern Science Teaching. London: John Murray (Publishers) Ltd., 1953. Part I. 171 p.

Aims, methods, importance of individual experiment, right kind of discipline, and 'General Science' or separate subjects of science are dealt with in this book.

Science Masters' Association. Secondary Modern Science Teaching. London: John Murray (Publishers) Ltd., 1957. Part II. 168 p.

This book deals with such matters as laboratory organisation, improvisation of apparatus, visual and aural aids, the formation of science library, and science for girls.

Sedgwick, William T., and Tyler, H. W. A Short History of Science. New York: The Macmillan Company, 1952. 512 p.  
509  
S448

It traces briefly the history of the foundations upon which advances were based; to correlate the steps of progress with the spirit of the times; and to increase the emphasis on the evolution of scientific methods.

Shannon, James I. The Amazing Electron. Milwaukee: The Bruce Publishing Company, 1946. 248 p.

539  
S528

The principles which are made use by scientists in developing the atomic bomb are dealt with in various portions of the book.

Shaplay, Harlow. ed. A Treasury of Science. New York: Harper & Brothers Publishers, 1946. 772 p.

The plan of the book is evident from the titles of the major parts: 'Science and Scientist'; 'The Physical World'; 'The World Life'; and 'The World of Man'.

Sidgwick, John B. William Herschel. London: Farber and Farber Limited, 1953. 228 p.

92  
H571s

Life history of William Herschel - explorer of the heavens.

Singer, Charles Joseph. A Short History of Biology. Oxford: The Clarendon Press, 1931. 572 p.

This work attempts to give, in simple language, a critical survey of the historical development of biological problems.

Smith, David Eugene. History of Mathematics. New York: Ginn and Company, 1923. (Volume I) 1925. (Volume II)

In volume I, there is a general survey of the progress of elementary mathematics arranged by chronological period with reference to racial and geological conditions. In Volume II, the subject is treated by topics.

Spitzer, Herbert F. The Teaching of Arithmetic.  
New York: Houghton Mifflin Company, 1948.  
397 p.

This book presents some of the procedures which have made the teaching of arithmetic to adults and to children a pleasant experience. In these procedures much emphasis is given to understanding.

Stabler, Edward Russell. Mathematical Thought.  
Cambridge, Mass.: Addison-Wesley Publishing  
Company, Inc., 1952. 268 p.

The chief aim of this book is to provide a unified and substantial approach to logical structure of mathematics, and to develop a corresponding philosophical point of view toward mathematical knowledge.

Standen, Anatomy. Science Is a Sacred Cow. New  
York: E. P. Dutton and Company, Inc.,  
1950. 221 p.

501.8  
S785

This book shows that science has important limitation, and the idea that science is infallible and beyond criticism is a delusion, and even a dangerous one.

Sutton, Sir Oliver Graham. Mathematics in Action.  
G. Bell and Sons, Ltd., 1954. 226 p.

510.4  
S967

This book is an exposition of the application of advanced mathematics to the study of the universe. The author demonstrates how mathematics is applied in ballistics, theory of computing machines, waves and wavelike phenomena, theory of fluid flow; meteorological problems, statistics, flight and similar phenomena.

Tilden, Sir William A. Famous Chemists - The Men and Their Work. London: G. Routledge & Sons, Ltd., 1921. 296 p.

540.9  
T571

This book attempts to sketch the lives of some of the most prominent chemists of the past.

Tory, Henry Marshall, and Nicholls, R. V. V. eds. A History of Science in Canada. Toronto: 1939. 152 p.

509.71  
T712

A symposium dealing with the rise and development of science and scientific men of Canada - men who could speak with authority from both science and history.

Warrington, C. J. S. A History of Chemistry in Canada. Toronto: Sir Isaac Pitman and Sons (Canada) Limited, 1949. 502 p.

540.9  
W295

This book is a general history of the teaching and application of chemistry in Canada up to year of 1949. It includes the stories of the chemical manufacturing industries and also the work of the consulting chemical laboratories and university research in pure science.

Weeks, Mary Elvira. Discovery of the Elements. Easton, Pa.: Journal of Chemical Education, 1956. 910 p.

This is a story of the disclosure, one by one, of the chemical element, which has never been told as a connected narrative. The reports of these discoverers are recorded for the most part in old chemical journals, biographical dictionaries, old letters, and obsolete text-books.

Wightman, William P. D. The Growth of Scientific Ideas. London: Oliver & Boyd, Ltd., 1950. 495 p.

This book is a guide to the study of the development of scientific thought. An attempt is made to appreciate the problems as they appeared to the leading thinkers of each age, to describe in outline the nature of the solutions attempted, and to assess the proportion of essential truth to psychological imagery which is inevitably interwoven therewith in the enunciation of this truth.

Wilson, Grove. Great Men of Science. New York: The New Home Library, 1942. 397 p.

Here is a book of biographies, giving us the stories of their lives and their discoveries.

Woodbury, David O. 1001 Questions Answered about the New Science. New York: Dodd, Mead & Company, 1959. 358 p.

The author, by the question-and-answer method, discusses the dawning age of space, the era of fission and fusion, and the drastic changes in engineering technology.

Young, John Z. Doubt and Certainty in Science. New York: Oxford University Press, 1960. 168 p.

504  
Y73

This is a biologist's reflection on the brain, a part of the nervous system, and its' functions.