

Bibliography

This descriptive bibliography contains a number of works allied in interest to the contents of this book. It is not (nor is it intended to be) full, authoritative, or exhaustive. It is merely an expression of personal tastes which may be helpful to the reader whose curiosity has been stimulated.

ABBOTT, EDWIN A. *Flatland—A Romance of Many Dimensions*. 1929. Dover edition, 0-486-27263-X.

The celebrated little book about a world of two dimensions.

AHRENS, W. *Mathematische Unterhaltungen und Spiele*. Leipzig: B. G. Teubner, Vol. I, 1910; Vol. II, 1918.

For those who can read German, this work will be a rare treat. Although parts of it are quite technical, it is an exhaustive, definitive study of puzzles with a wealth of related stories, anecdotes, and historical sketches.

BALL, W. W. ROUSE. *Mathematical Recreations and Essays*. 11th Edition. 1939. Revised Dover edition with Coexter, 0-486-25357-0.

This is a standard work, packed with information, but arranged more as a handbook than for continuous reading. It is indispensable for anyone who likes puzzles.

BELL, E. T. *Men of Mathematics*. New York: Simon and Schuster, 1937.

The various portions of this book devoted to non-Euclidean geometry make stimulating and engaging reading. On this as well as other subjects of mathematics, Bell is clear, his style racy and entertaining. There are biographical sketches of the leading mathematicians from Zeno to Poincaré, sometimes distinguished, often delightful, always readable. The exposition of difficult phases of mathematics is particularly good.

— . *The Queen of the Sciences*. New York: G. E. Stechert, 1938.

This is a reprint of a charming little volume, published originally for the World's Fair at Chicago, 1933. Simple, worth reading.

BLACK, MAX. *The Nature of Mathematics*. New York: Harcourt Brace, 1935.

An account of the mathematical philosophies of the three principal contemporary schools, concise and clear, but by no means easy reading.

BLISS, G. A. "Mathematical Interpretations of Geometrical and Physical Phenomena," *American Mathematical Monthly*, Vol. 40 (October, 1933).

A readable account of the application of mathematics to physical phenomena.

BRIDGMAN, PERCY W. *The Logic of Modern Physics*. New York: Macmillan, 1927.

Not a mathematics book, but a crystal-clear exposition of modern physical theories, the laws of cause and effect, and probability, by a distinguished physicist.

BALL, W. W. ROUSE. *History of Mathematics*. New York: Macmillan, 1925.

CAJORI, FLORIAN. *History of Mathematics*. New York: Macmillan, 1919.

Both of these are standard histories of mathematics. The work by Cajori is quite detailed, though nothing in comparison to Moritz Cantor's monumental German history of mathematics in four large volumes. Ball's work, while in some respects out of date and discursive, is sufficiently authoritative, and being less detailed, can be read more pleasantly with far less of a mathematical background.

CAJORI, FLORIAN. "History of Zeno's Arguments on Motion," *American Mathematical Monthly*, Vol. XXII. (1915) Pp. 1-6, 292-297.

— . *A History of Elementary Mathematics*. New York: Macmillan, 1917.

A standard work, interesting, not too technical, informative.

CANTOR, GEORG. *Contributions to the Founding of the Theory of Transfinite Numbers*. Edited by P. B. Jordain. 1915. Dover edition, *Contributions to Transfinite Numbers*, 0-486-60045-9.

A translation of Cantor's work on the infinite, particularly valuable for the historical introduction.

CARSLAW, HORATIO S. *The Elements of Non-Euclidean Plane Geometry and Trigonometry*. London: Longmans Green & Co., 1916.

A good elementary text on non-Euclidean geometry. Technical.

COHEN AND NAGEL. *Introduction to Logic and Scientific Method*. New York: Harcourt Brace, 1934.

An admirable book in every way. A textbook in a class by itself. Refreshing and lucid chapters on the entire problem of scientific method and a special chapter on probable inference, well reasoned, well written.

COOLEY, GANS, KLINE, and WAHLERT. *Introduction to Mathematics*. New York: Houghton Mifflin Co., 1937.

A clear, unpretentious introduction to many advanced branches of mathematics, including infinite classes. It is also suitable for several other topics discussed in this book. A text.

COURANT, RICHARD. *Differential and Integral Calculus*. Vol. I. London: Blackie & Son, 1934.

An excellent text with unusually good examples of the applications of the calculus.

DANTZIG, TOBIAS. *Number, the Language of Science*. New York: Macmillan, 1933.

An interesting nontechnical account of the development of the number concept up to and including the transfinites.

DE MORGAN, AUGUSTUS. *Budget of Paradoxes*. Chicago: Open Court, 1940.

A collection of letters, stories, anecdotes, paradoxes, and puzzles, all relating to mathematics.

DRESDEN, ARNOLD. *An Invitation to Mathematics*. New York: Henry Holt & Co., 1936.

Unusually praiseworthy text on higher mathematics, covering analytic geometry, number theory, the calculus, projective geometry, the mathematics of the infinite. A text with a well-executed idea of making mathematics attractive; it presupposes a knowledge of only elementary algebra and geometry.

EDDINGTON, SIR ARTHUR S. *Space, Time, and Gravitation*. Cambridge University Press, 1920.

Brilliant discussion of the problems of relativity including chapters on "kinds of space" and "What is geometry?" Nontechnical, but by no means simple.

—. *New Pathways of Science*. New York: Macmillan, 1935.

Contains interesting discussions on probability by a famous astronomer and equally famous writer on popular science. Beyond that, the rest is also worth reading, as is anything by Eddington.

ENRIQUES, FEDERIGO. *Historic Development of Logic*. New York: Henry Holt, 1929.

The best work of its kind. The "principles and structure of science in the conception of mathematical thinkers." Largely nontechnical but occasionally difficult.

GALILEO. *Two New Sciences*. 1914. Dover edition, *Dialogues Concerning Two New Sciences*, 0-486-60099-8.

Not only one of the greatest books of all times, but a perfectly fascinating one. It contains, among much else, Galileo's views on infinity. For anyone interested in the history of science or mathematics, or, for that matter, for anyone who enjoys reading.

GRANVILLE, WILLIAM A., SMITH, P. F., and LONGLEY, W. R. *Elements of the Differential and Integral Calculus*. Boston: Ginn & Co., 1934.

A good elementary textbook. Well printed, clear.

HARDY, G. H. *A Course of Pure Mathematics*. 6th Edition. Cambridge: Cambridge University Press, 1933.

A standard work, this elementary introduction to higher mathematics is a tough morsel but will repay whatever you invest in it in terms of effort.

HOGBEN, LANCELOT T. *Mathematics of the Million*. New York: W. W. Norton, 1937.

The "Gone With The Wind" of mathematics. Well-written, interesting, this is by no means an easy book. The Marxian interpretation of the history of science and mathematics in Hogben's pungent style pervades the whole.

JEANS, SIR JAMES H. *The Mysterious Universe*. New York: Macmillan, 1930.

Lucid exposition of modern science. Sir James has an inimitable gift for making hard things easy, for making gigantic numbers easier to remember than telephone numbers, for making tenuous scientific theories more transparent than invisible glass.

KEYNES, JOHN MAYNARD. *A Treatise on Probability*. London: Macmillan, 1921.

It would be hard to find a more intelligent and comprehensive work on the philosophy and mathematics of probability, although many portions are only for the trained mathematician. Parts of it, nevertheless, are easily understandable, and the style, like Bertrand Russell's, is sparkling.

KEYSER, CASSIUS, J. *Mathematical Philosophy*. New York: Dutton, 1922.

Well-written, not too technical, and clear. In addition, Professor Keyser has written many other brilliant essays on mathematics and the humanizing of mathematics. He would deserve the title of the Grand Old Man of Mathematics—were it not for the fact that it would never occur to anyone that Keyser at 78 is anything but youthful.

KLEIN, FELIX. *Elementary Mathematics from a Higher Standpoint*. New York: Macmillan, 1932.

A mathematical classic, although not easy to follow for the non-mathematician. Contains a wealth of material, including a discussion of transfinite mathematics.

LEVY, HYMAN. *Modern Science*. Knopf, 1939.

This volume devotes considerable portions to the applications of mathematics to science. Professor Levy possesses unusual gifts of simplification. Highly recommended.

LIEBER, LILLIAN R. and HUGH G. *Non-Euclidean Geometry*. New York: Academy Press, 1931.

A delightful little book with charming illustrations, making the elements of non-Euclidean geometry readily understandable.

MANNING, H. P. *Non-Euclidean Geometry*. Boston: Ginn & Co., 1901.

A brief, rather simple text.

—. *The Fourth Dimension Simply Explained*. New York: Munn & Co., 1910.

A collection of essays on the fourth dimension, submitted in a prize contest run by *The Scientific American*. Many of the essays are

amusing, much ingenuity being displayed in finding analogues of four-dimensional figures in a three-dimensional world.

MARK, THIRRING, NÖBELING, HAHN, and MENGER. *Krise und Neuaufbau in den exakten Wissenschaften*. Vienna: Franz Deuticke, 1937.

A collection of German essays by well-known physicists and mathematicians on the revolutionary aspects of modern science. All the contributors to this splendid work were members of the celebrated "Vienna Circle." The lecture by Hans Hahn is an interesting presentation of some of the more startling paradoxes of modern mathematics.

MERZ, J. T. *History of European Thought in the 19th Century*. Edinburgh: Blackwood & Sons, 4th Edition, 1923.

In this monumental and always eminently readable work, there is a very full treatment of the development of mathematics in the nineteenth century—particularly statistics and the theory of probability.

PEIRCE, CHARLES S. *Chance, Love, and Logic*. New York: Harcourt, Brace, Inc., 1923.

A collection of philosophical essays, particularly on the subject of probability, by one of America's most distinguished philosophers—the founder of pragmatism.

POINCARÉ, HENRI. *The Foundations of Science*. Garrison, New York: The Science Press, 1913.

Anything Poincaré wrote is worth reading. The pellucid quality of his style makes all of his nontechnical writings readily comprehensible to the layman.

RUSSELL, BERTRAND. *Introduction to Mathematical Philosophy*. 1919. Dover edition, 0-486-27724-0.

A standard work, but sometimes tough sledding. No discussion of this subject is easy, but Russell is always readable.

—. *Mysticism and Logic*. New York: Longmans Green, 1919.

The essay, "Mathematics and Metaphysicians" in this collection is in Russell's best style: brilliant, impudent, and jaunty. The problems of infinite classes and Zeno's paradoxes are particularly well treated. The essay "A Free Man's Worship" is one of the finest and noblest expressions of faith in science and reason in the English language.

SMITH, DAVID E. *History of Mathematics*, Vols. I and II. Vol. I, 1923; Vol. II, 1925. Dover edition, Vol. I, 0-486-20429-4; Vol. II, 0-486-20430-8.

A good history, profusely illustrated and well-suited for the non-professional.

STEINHAUS, H. *Mathematical Snapshots*. 1938. Dover edition, 0-486-40914-7.

Intended to reveal some of the more unusual aspects of mathematics, including mathematical paradoxes. Requires no mathematical training whatsoever.

SULLIVAN, J. W. N. *Aspects of Science*, 2nd Series. London: W. Collins Sons, 1926.

Stimulating essays for the layman on a variety of subjects, including mathematics. Recommended, by the same author, *Limitations of Science*, Chatto and Windus, London, 1933.

SWANN, W. F. G. *The Architecture of the Universe*. New York: The Macmillan Co., 1934.

A physicist tells how probability is used in studying the laws of gases. Well written, nontechnical.

WHITEHEAD, ALFRED N. *An Introduction to Mathematics*. New York: Henry Holt, 1911.

This might well serve as a model for all popular books on mathematics. Nothing quite as good appeared before or since its publication. Designed for the layman, it is simple but not condescending, witty but free from "epigramitis," perfectly clear, informative, full of verve, good humor and understanding. A first-rate job in every respect.

YOUNG, J. W. *Fundamental Concepts of Algebra and Geometry*. New York: Macmillan, 1911.

A most enjoyable collection of lectures. Suitable for the neophyte.