

SCIENCE ANCILLARY READINGS

RECOMMENDATIONS

COMPILED BY JAMES D. NICKEL

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INTRODUCTORY COMMENTS:

On several occasions, I have been asked by friends, teachers, and parents to provide a list of readings in science. Over the past 40 years, I have read much in science because my research in mathematics requires it. This list is only a selected list; a list made with high school students (and high school teachers) in mind. It is a general pot-pourri of titles written by authors from wide spectrums of viewpoints, i.e., the embrace of a Weltanschauung (a comprehensive world view, philosophy of life, or personal ideology). This list is not categorized but it covers all the basic subjects of high school science (with an emphasis on physics and its mathematical revelations). For me personally, I consider it a shame for a student of science to receive his or her instruction only from a textbook. Ancillary readings in science are a must if one wants to experience the enrichment that science and its history brings to the table. Therefore, you will find in this list interesting histories (of salt, of the pendulum, of the screw, of the compass, of the Raytheon Corporation, of the Difference Engine, etc.). The authors wrote these histories to both inform and entertain, similar to a good mystery story. As students, you have the gift of time to explore these readings, to be enriched by them, and to become leaders in your world by the knowledge obtained. Remember, read to be informed so that you can lead. In the battle of ideas (2 Corinthians 10:5), we are commanded to take every thought captive unto the obedience of Christ. I pray that these readings be a springboard to such God-honoring imprisonment.

Every high school library should have these books on its shelves.

THEMATIC

- Benjamin D. Wiker, *The Mystery of the Periodic Table?* (Ignatius Press, 2003): Junior high and above.
- P. W. Atkins, *Periodic Kingdom: A Journey into the Land of the Chemical Elements* (Basic Books, 1995): High school level and above.
- Isaac Asimov, *Building Blocks of the Universe* (Abelard-Schuman: 1974): Junior high and above.
- Isaac Asimov, *Understanding Physics* (Dorset Press, 1966): High school and above.
- Isaac Asimov, *Asimov's New Guide to Science* (Basic Books, 1984): High school and above.
- Fred Schaaf, *40 Nights to Knowing the Sky* (Henry Holt, 1998): High school and above.
- Martin Martha Evans and Donald Howard Menzel, *The Friendly Stars: How to Locate and Identify Them* (Dover, 1966): Junior high and above.
- Robert P. Crease, *The Prism and the Pendulum: The Ten Most Beautiful Experiments in Science* (Random House, 2003): High school and above.
- James Jespersen & Jane Fitz-Randolph, *From Sundials to Atomic Clocks* (Dover, 1982): Junior high and above.
- Dava Sobel, *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time* (Walker and Company, 1995): High school and above.
- Elizabeth A. Wood, *Science from Your Airplane Window* (Dover, 1975): Junior high and above.
- M. Minnaert, *The Nature of Light & Color in the Open Air* (Dover, 1954): Junior high and above.

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- Simon Garfield, *Mauve: How One Man Invented a Color that Changed the World* (W. W. Norton, 2001): High school and above.
- Gerald R. Rising, *Inside Your Calculator: From Simple Programs to Significant Insights* (John Wiley 2007): High school and above.
- Doron Swade, *The Difference Engine: Charles Babbage and the Quest to Build the First Computer* (Viking, 2000): High school and above.
- Witold Rybczynski, *One Good Turn: A Natural History of the Screwdriver and the Screw* (Scribner, 2000): High school and above.
- Amir D. Aczel, *The Riddle of the Compass: The Invention that Changed the World* (Harcourt, 2001): High school and above.
- Mark Kurlansky, *Salt: A World History* (Penguin, 2002): High school and above.
- Otto Scott, *The Creative Ordeal: The Story of Raytheon* (Atheneum, 1974): High school and above.
- Jim Sinclair, *How Radio Signals Work* (McGraw-Hill, 1997): High school and above.
- David L. Goodstein and Judith R. Goodstein, *Feynman's Lost Lecture: The Motion of Planets Around the Sun* (W. W. Norton, 1996): Upper high school and above.
- Harvey E. White and Donald H. White, *Physics and Music: The Science of Musical Sound* (Dover, 1980): High school and above.

PERSPECTIVES

- Malcolm A. Jeeves, *The Scientific Enterprise & Christian Faith* (Inter-Varsity, 1969): High school and above.
- Michael Polyani, *The Tacit Dimension* (The University of Chicago Press, 1966): high school and above, teachers included.
- Stanley L. Jaki, *The Relevance of Physics* (Scottish Academic Press, 1992): High school and above, including teachers.
- Stanley L. Jaki, *Cosmos and Creator* (Scottish Academic Press, 1981): High school and above, including teachers.
- Richard Feynman, *The Character of Physical Law* (The MIT Press, 1965): Upper high school and above.
- Thomas F. Torrance, ed. *Belief in Science and in Christian Life* (Wipf & Stock, 1998): High school and above, including teachers.
- Thomas F. Torrance, *Divine and Contingent Order* (Wipf & Stock, 2005): High school and above, including teachers.
- Thomas F. Torrance, *The Christian Frame of Mind: Reason, Order, and Openness in Theology and Natural Science* (Helmets & Howard, 1989): High school and above, including teachers.
- Thomas F. Torrance, *Christian Theology and Scientific Culture* (Oxford University Press, 1981): High school and above, including teachers.

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- Thomas F. Torrance, *Transformation & Convergence in the Frame of Knowledge: Explorations in the Interrelations of Scientific and Theological Enterprise* (Eerdmans, 1984): High school and above, including teachers.
- John Polkinghorne, *Science and the Trinity: The Christian Encounter with Reality* (Yale University Press, 2004): High school and above, including teachers.
- James Nickel, *Mathematics: Exploring Beauty—Trinitarian Perspectives* (Sound Mind Press, 2024): High school and above.
- Tapio Luoma, *Incarnation and Physics: Natural Science in the Theology of Thomas F. Torrance* (Oxford University Press, 2002): High school and above, including teachers.
- Kitty Ferguson, *Fire in the Equations: Science, Religion & the Search for God* (Eerdmans, 1994): High school and above.
- Kitty Ferguson, *Measuring the Universe: Our Historic Quest to Chart the Horizons of Space and Time* (Walker, 1999): High school and above.
- John Byl, *God and Cosmos: A Christian View of Time, Space, and the Universe* (The Banner of Truth Trust, 2001): High school and above.
- John Byl, *The Divine Challenge: On Matter, Mind, Math & Meaning* (The Banner of Truth Trust, 2004): High school and above, including teachers.
- Albert M. Wolters, *Creation Regained: Biblical Basis for a Reformational Worldview* (Eerdmans, 1985): Upper high school and teachers of science.
- Tim Morris and Don Petcher. *Science & Grace: God's Reign in the Natural Sciences* (Crossway, 2007): Upper high school and all teachers of science.
- Chet Raymo, *The Path: A One-Mile Walk Through the Universe* (Walker and Company, 2003): a fascinating analysis of how a scientist observes and thinks; High school and above.
- Guru Madhavan, *Applied Minds: How Engineers Think* (W. W. Norton, 2015): High school and above.
- Frank Wilczek, *A Beautiful Question: Finding Nature's Deep Design* (Penguin, 2015): Upper high school and above.
- Frank Wilczek, *Fundamentals: Ten Keys to Reality* (Penguin, 2021): Upper high school and above.
- Fritz Rohrlich, *From Paradox to Reality: Our Basic Concepts of the Physical World* (Cambridge University Press, 1987): Upper high school and above.
- Jonathan Wells, *Icons of Evolution: Science or Myth?* (Regnery, 2000): High school and above.
- Stephen C. Meyer, *Signature in the Cell: DNA and the Evidence for Intelligent Design* (Harper One, 2009): High school and above.
- Stephen C. Meyer, *Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design* (Harper One, 2013): High school and above.
- Stephen C. Meyer, *Return of the God Hypothesis: Three Scientific Discoveries that Reveal the Mind Behind the Universe* (Harper One, 2021): High school and above.
- Iain Paul, *Science, Theology and Einstein* (Scottish Academic Press, 1982): High school and above.

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- Iain Paul, *Science and Theology in Einstein's Perspective* (Scottish Academic Press, 1986): High school and above.
- Victor H. Fiddes, *Science and the Gospel* (Scottish Academic Press, 1987): High school and above.

HISTORY

- B. L. van der Waerden, *Science Awakening I: Egyptian, Babylonian and Greek Mathematics* (Kluwer Academic, 1954): High school and above.
- Otto Neugebauer, *The Exact Sciences in Antiquity* (Barnes & Noble, 1993): High school and above.
- Kitty Ferguson, *Pythagoras: His Lives and the Legacy of a Rational Universe* (Walker, 2008): High school and above.
- Stanley L. Jaki, *Science and Creation: From Eternal Cycles to an Oscillating Universe* (Scottish Academic Press, 1986): High school and above, including teachers.
- Peter J. Floriani, *A Scholium to S. L. Jaki's Science and Creation* (2017): High school and above, including teachers.
- Stanley L. Jaki, *The Road of Science and the Ways to God* (Scottish Academic Press, 1986): High school and above, including teachers.
- Stanley L. Jaki, *The Origin of Science and the Science of its Origin* (Scottish Academic Press, 1979): High school and above, including teachers.
- Stanley L. Jaki, *The Savior of Science* (Eerdmans, 2000): High school and above, including teachers.
- Herbert Butterfield, *The Origins of Modern Science* (G. Bell & Sons, 1957): High school and above.
- E. A. Burt, *The Metaphysical Foundations of Modern Science: The Scientific Thinking of Copernicus, Galileo, Newton and their Contemporaries* (Humanities Press, 1952): High school and above.
- A. C. Crombie, *The History of Science from Augustine to Galileo* (Dover, 1995): High school and above.
- James Hannam, *The Genesis of Science: How the Christian Middle Ages Launched the Scientific Revolution* (Regnery, 2011): High school and above.
- Charles E. Hummel, *The Galileo Connection: Resolving Conflicts between Science & the Bible* (InterVarsity, 1986): High school and above.
- Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600* (Cambridge University Press, 1997): High school and above.
- Tony Rothman, *Instant Physics: From Aristotle to Einstein, and Beyond* (Byron Preiss, 1995): High school and above.
- Etienne Gilson, *The Unity of the Philosophical Experience: The Medieval Experiment, The Cartesian Experiment, the Modern Experiment* (Ignatius Press, 1964): Upper high school and teachers of science.
- J. D. Bernal, *A History of Classical Physics: From Antiquity to the Quantum* (Barnes and Noble, 1972): High school and above.
- Frances and Joseph Gies, *Cathedral, Forge, and Waterwheel: Technology and Invention in the Middle Ages* (Harper Collins, 1994): High school and above

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- Jean Gimpel, *The Medieval Machine: The Industrial Revolution of the Middle Ages* (Penguin, 1976): High school and above.
- Lynn White, Jr., *Medieval Technology & Social Change* (Oxford University Press, 1962): High school and above.
- Lynn White, Jr., *Medieval Religion and Technology* (University of California Press, 1978): High school and above.
- Max Caspar, *Kepler* (Dover, 1993): High school and above.
- Alfred North Whitehead, *Science and the Modern World* (Free Association Books, 1985): High school and above.
- Morris Kline, *Mathematics in Western Culture* (Oxford University Press, 1953): High school and above.
- Morris Kline, *Mathematics and the Physical World* (Dover, 1981): High school and above.
- James Nickel, *Mathematics: Is God Silent?* (Ross House, 2001): High school and above.
- Basil Mahon, *The Man Who Changed Everything: The Life of James Clerk Maxwell* (John Wiley, 2004): High school and above.
- Nancy Forbes and Basil Mahon, *Faraday, Maxwell, and the Electromagnetic Field* (Prometheus, 2014): Upper high school and above.
- Bruce Ritchie, *James Clerk Maxwell: Faith, Church and Physics* (2024): High school and above.
- Banesh Hoffmann, *Relativity and its Roots* (Dover, 1983): Upper high school and above.
- Denis Brian, *Einstein: A Life* (John Wiley, 1996): High school and above.
- Abraham Pais, *The Science and the Life of Albert Einstein* (Oxford University Press, 1982): Upper high school and above.

SCIENCE OVERVIEWS: PRIMARY FOCUS ON PHYSICS

- William C. Vergara, *Science, the Never-Ending Quest* (Harper & Row, 1965): Junior high and above. This book is out of print but worth trying to locate because it is an excellent historical survey.
- Lewis Carrol Epstein, *Thinking Physics: Understanding Practical Reality* (Insight Press, 2005): High school and above (consists of short, one-page summaries of basic physical principles).
- Anne Rooney, *How the World Works: Physics* (Arcturus, 2019): High school and above.
- Anne Rooney, *How the World Works: Mathematics* (Arcturus, 2019): High school and above.
- Lloyd W. Taylor, *Physics, The Pioneer Science: Mechanics, Heat, Sound*, Volume 1 (Dover, 1941): High school and above.
- Lloyd W. Taylor, *Physics, The Pioneer Science: Mechanics, Light, Electricity*, Volume 2 (Dover, 1941): High school and above.
- David W. Snoke, *Natural Philosophy: A Survey of Physics and Western Thought* (Access Research Network, 2003): Originally given as a set of lectures to high school homeschoolers and it encourages philosophical analysis along with mastery of mathematical skills; High school and above (including teachers);

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- W. Thomas Griffith, *The Physics of Everyday Phenomena: A Conceptual Introduction to Physics* (McGraw Hill, 2001): Focus on concepts, not mathematics; High school and above.
- Paul G. Hewitt, *Conceptual Physics* (Pearson: 2018): Focus on concepts, not mathematics; High school.
- Robert H. March, *Physics for Poets* (2003): High school and above.
- Richard Wolfson and Jay M. Pasachoff, *Physics for Scientists and Engineers* (Addison-Wesley, 1999): If you want to understand physics from both concepts and mathematics, including calculus, then this text will ably meet these requirements; Upper high school and above.
- Arnold D. Pickar, *Preparing for General Physics: Calculus Version* (Addison-Wesley, 1993): Upper high school and above.
- Jim Holt, *When Einstein Walked with Gödel: Excursions to the Edge of Thought* (Farrar, Straus and Giroux, 2019): Upper high school and above.
- Gerald Holton, *Introduction to Concepts and Theories in Physical Science* (Princeton University Press, 1985): Upper high school to university.
- Malcolm Longair, *Theoretical Concepts in Physics: An Alternative View of Theoretical Reasoning in Physics* (Cambridge University Press, 2020: Upper high school to university.
- Ernest H. Hutten, *The Ideas of Physics* (Oliver & Boyd, 1967): Upper high school and above.
- William Berkson, *Fields of Force: The Development of a World View from Faraday to Einstein* (John Wiley, 1967): Upper high school and above.
- Colin Bruce, *The Einstein Paradox and Other Science Mysteries Solved* (Perseus, 1997): High school and above.
- Richard DeWitt, *Worldviews: An Introduction to the History and Philosophy of Science* (John Wiley, 2010): High school and above.

ORIGINAL WORKS

- Nicolaus Copernicus, *On the Revolutions of Heavenly Spheres* (Prometheus, 1995).
- Galileo Galilei, *Discoveries and Opinions of Galileo* (Doubleday, 1957).
- Galileo Galilei, *Dialogues Concerning Two New Sciences* (Dover, 1954).
- Galileo Galilei, *Dialogue Concerning the Two Chief World Systems* (The Modern Library, 2001).
- Johannes Kepler, *Epitome of Copernican Astronomy & Harmonies of the World* (Prometheus, 1995).
- Isaac Newton, *The Principia* (Prometheus, 1995).
- Isaac Newton, *Opticks* (Dover, 1979).
- Charles Darwin. *The Origin of the Species* (many versions).
- James Clerk Maxwell, *A Dynamical Theory of the Electromagnetic Field*, Thomas F. Torrance, ed. (Wipf & Stock, 1996)
- Albert Einstein, *Out of My Later Years* (Gramercy, 1993)
- Albert Einstein, *Ideas and Opinions* (Crown, 1995)
- Albert Einstein, *The World as I See It* (Citadel, 1979)
- Albert Einstein, *Sidelights on Relativity* (Citadel, 1979)

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- Albert Einstein and Leopold Infeld, *The Evolution of Physics: From Early Concepts to Relativity and Quanta* (Simon and Schuster, 2008)