

The Quest: Energy, Security, and the Remaking of the Modern World

Daniel Yergin

The Penguin Press, a division of Penguin Group Inc.
375 Hudson Street
New York, New York 10014 USA
2011. 816 pages. US\$ 37.95
ISBN 978-1-594-20283-4

Daniel Yergin continues the story of global energy as the engine of geopolitical and economic change in this book, a follow-up to his 1991 book *The Prize: The Epic Quest for Oil, Money, and Power*, for which he won a Pulitzer Prize. From China to the Caspian Sea, from the Mideast to Capitol Hill, Yergin explores the decisions and choices that are shaping our energy-dependent future. He also describes the history of nuclear energy, coal, electricity and natural gas and investigates biofuels and wind and solar energy, explaining why these are crucial to the world's energy future.

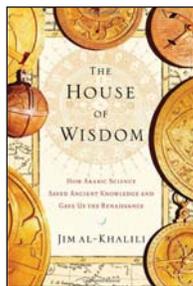
Contents:

- Introduction
- Part One—The New World of Oil: *Russia Returns, The Caspian Derby, Across the Caspian, "Supermajors," The Petro-State, Aggregate Disruption, War in Iraq, The Demand Shock, China's Rise, China in the Fast Lane*
- Part Two—Securing the Supply: *Is the World Running Out of Oil?, Unconventional, The Security of Energy, Shifting Sands in the Persian Gulf, Gas on Water, The Natural Gas Revolution*
- Part Three—The Electric Age: *Alternating Currents, The Nuclear Cycle, Breaking the Bargain, Fuel Choice*
- Part Four—Climate and Carbon: *Glacial Change, The Age of Discovery, The Road to Rio, Making a Market, On the Global Agenda, In Search of Consensus*
- Part Five—New Energies: *Rebirth of Renewables, Science Experiment, Alchemy of Shining Light, Mystery of Wind, The Fifth Fuel—Efficiency, Closing the Conservation Gap*

- Part Six—Road to the Future: *Carbohydrate Man, Internal Fire, The Great Electric Car Experiment*
- Conclusion: "A Great Revolution"
- Credits, Notes, Bibliography, Index

👍 *Mr. Yergin is back with a sequel to The Prize . . . and, if anything, it's an even better book. It is searching, impartial and alarmingly up to date. . . . The Quest will be necessary reading for C.E.O.'s, conservationists, lawmakers, generals, spies, tech geeks, thriller writers . . . and many others. But it won't be easy reading. This is a very large and not overly elegant book. . . . The Quest is encyclopedic in its ambitions; it resists easy synopsis. What sucks you onward are its strong set pieces, some of the best of which are about what Mr. Yergin calls 'the new world of oil.'*

Garner D: "Visions of an Age When Oil Isn't King." *The New York Times*, (September 20, 2011), <http://www.nytimes.com/2011/09/21/books/the-quest-by-daniel-yergin-review.html> (accessed September 28, 2011).



The House of Wisdom: How Arabic Science Saved Ancient Knowledge and Gave Us the Renaissance

Jim al-Khalili

The Penguin Press, a division of Penguin Group Inc.
375 Hudson Street
New York, New York 10014 USA
2011. 336 pages. US\$ 29.95
ISBN: 978-1-594-20279-7

The author describes the scientific innovations—in medicine, mathematics, optics, astronomy and chemistry—of the Islamic world from the ninth through the fourteenth centuries and reveals how they underpinned and enabled the European Renaissance. These discoveries, principles and evidence-based approaches were, the author posits, obscured by later Western versions of the same principles. The author also explores why and how the Arab world entered its own dark ages after centuries of enlightenment.

Contents:

- A Dream of Aristotle
- The Rise of Islam
- Translation
- The Lonely Alchemist
- The House of Wisdom
- Big Science
- Numbers
- Algebra
- The Philosopher
- The Medic
- The Physicist
- The Prince and the Pauper
- Andalusia
- The Marāgha Revolution
- Decline and Renaissance
- Science and Islam Today
- Notes, Glossary of Scientists, Index

👍 *British-Iraqi physicist Al-Khalili . . . retraces this vital contribution of Islamic scientific thought. His enthusiasm, interjection of personal anecdotes, and conversational style will make the story accessible for nonspecialists.*

👎 *. . . . The book is marred by the author's repeated admonitions to acknowledge the value and worth of the Islamic tradition, by comparisons of the 'greatness' of this or that Islamic figure with one from the Latin West, and, ironically, by assessments of the work of Islamic figures based, not in their historical and intellectual context, but in their closeness to or presaging of modern ideas.*

Bantz D: *Choice* 49, no. 2 (October 2011): 326.

👍 *. . . . modern historians of science agree that more attention should be given to the Arab contribution to the preservation and expansion of knowledge at this critical period, and the author has done so in considerable detail and with rising passion. . . . By recounting Arabic science's luminous past, al-Khalili says he hopes to instill a sense of pride that will 'propel the importance of scientific enquiry back to where it belongs: at the very heart of what defines a civilized and enlightened society.'*

Wilford JN: "The Muslim Art of Science." *The New York Times*, (May 20, 2011), http://www.nytimes.com/2011/05/22/books/review/book-review-the-house-of-wisdom-by-jim-al-khalili.html?_r=1&pagewanted=all (accessed October 17, 2011).

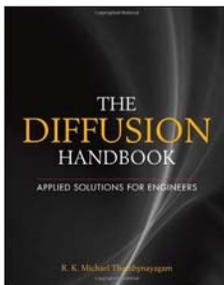
Going to Extremes. High-pressure, high-temperature (HPHT) wells present challenges for conventional sampling and pressure equipment. Whereas engineers can repackaging sensors or protect sensitive downhole electronics for short durations with flasks, some tools used for evaluating wells must be completely reengineered if they are to survive the rigors of HPHT conditions. This article describes three reengineered tools used for evaluating wells and a mud system that can withstand extreme operating temperatures.

Seismic Methods for Mapping Fractures.

Over the last decade, oil and gas companies have had increased success placing wells within productive zones—sweet spots—of fractured reservoirs. Advances in seismic techniques have been especially useful in helping geoscientists identify and characterize these zones. This article describes detailed case studies of successes using seismic methods to help operating companies make decisions about well placement in fractured reservoirs.

Drilling Automation. For the past 10 to 20 years, many newly built rigs have included automated drill floor hardware such as iron roughnecks and pipe-handling equipment to increase safety and operational consistency. Drilling automation seeks to optimize the drilling process as a whole. This article looks at how the industry is linking the rig to automated downhole systems in efforts to lower reservoir access costs and outperform manual operations.

Microbes. Microbes and humans have existed as both enemy and ally for millions of years. That dual nature also exists in the oil field. Microbes can plug formations and cause corrosion and reservoir souring, but they can also enhance oil recovery. New, analytical methods are giving scientists insights into this unseen world. As a result, new applications are emerging that will help producers more effectively control and harness microbial behavior.



**The Diffusion Handbook:
Applied Solutions for Engineers**
R. K. Michael Thambayagam
McGraw-Hill Companies, Inc.
1221 Avenue of the Americas,
45th Floor
New York, New York 10020 USA
2011. 2,048 pages. US\$ 199.00
ISBN: 978-0-07-175184-1

In this book, Thambayagam, a Schlumberger Technical Director and Senior Advisor, provides solutions to boundary-value problems associated with Dirichlet, Neumann and Robin boundary conditions as well as solutions to variations on these problems. *The Diffusion Handbook* is the recipient of the 2011 R. R. Hawkins Award, the top prize from the American Association of Publishers for Professional and Scholarly Excellence, as well as the PROSE Award for Excellence in Physical Sciences & Mathematics and the PROSE Award for Excellence in the Engineering & Technology category.

Contents:

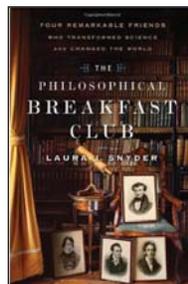
- Preliminaries
- Integral Transforms and Their Inversion Formulae
- Infinite and Semi-Infinite Continua. $p(x, t)$ Is a Function of x and t Only.
- Bounded Continuum. $p(x, t)$ Is a Function of x and t Only.
- Infinite and Semi-Infinite (Quadrant) Continua. $p(x, y, t)$ Is a Function of x, y and t Only.
- Infinite and Semi-Infinite Lamella. $p(x, y, t)$ Is a Function of x, y and t Only.
- Rectangle. $p(x, y, t)$ Is a Function of x, y and t Only.
- Infinite and Semi-Infinite (Octant) Continua. $p(x, y, z, t)$ Is a Function of x, y, z and t Only.
- Quadrant Layer: Infinite and Semi-Infinite Continua. $p(x, y, z, t)$ Is a Function of x, y, z and t Only.
- Octant Layer: Infinite and Semi-Infinite Continua. $p(x, y, z, t)$ Is a Function of x, y, z and t Only.
- Cuboid. $p(x, y, z, t)$ Is a Function of x, y, z and t Only.
- Infinite and Semi-Infinite Cylindrical Continua. $p(r, t)$ Is a Function of r and t Only.

- Bounded Cylindrical Continua. $p(r, t)$ Is a Function of r and t Only.
- Infinite and Semi-Infinite Cylindrical Continua. $p(r, \theta, t)$ Is a Function of r, θ and t Only.
- Bounded Cylindrical Continuum. $p(r, \theta, t)$ Is Cyclic Around the Cylinder with a Period of 2π . $p(r, \theta, t)$ Is a Function of r, θ and t .
- Wedge-Shaped Infinite and Semi-Infinite Continua. The Range of the θ Variable is a Portion of the Circle; That Is, $0 < \theta < \vartheta$, Where $\vartheta < 2\pi$ and the Initial and Boundary Conditions are Functions of r, θ and t .
- Wedge-Shaped Bounded Continuum. The Range of θ is a Portion of the Circle; That Is, $0 \leq \theta \leq \vartheta$, Where $\vartheta < 2\pi$. $p(r, \theta, t)$ Is a Function of r, θ and t .
- Infinite and Semi-Infinite Cylindrical Continua. The Continuum Is Also Either Infinite or Semi-Infinite in z . $p(r, z, t)$ Is a Function of r, z and t .
- Infinite and Semi-Infinite Cylindrical Continua Bounded by the Planes $z = 0$ and $z = d$. $p(r, z, t)$ Is a Function of r, z and t .
- Bounded Cylindrical Continuum. The Independent Variable z Is Either Infinite or Semi-Infinite. $p(r, z, t)$ Is a Function of r, z and t .
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- Appendices, Author Comments.

📖 *This reference book is a compendium of analytical solutions of the diffusion equation in three dimensions for a variety of geometries and boundary conditions. . . . The table of contents is . . . unique in that each solution is listed by showing a sketch of each geometry being solved and the associated boundary conditions. . . .*

This massive book is mainly filled with mathematical solutions. . . . Engineers or scientists who work with solutions to the diffusion equation and would like an extensive reference book for analytical solutions rather than relying on numerical techniques would find this book to be an incredible resource with nothing else comparable.

Shea JJ: "Book Reviews," *IEEE Electrical Insulation Magazine* 28, no. 2 (March/April 2012): 63.



The Philosophical Breakfast Club: Four Remarkable Friends Who Transformed Science and Changed the World
Laura J. Snyder
Broadway Books, an imprint of Crown Publishing, a division of Random House
1745 Broadway
New York, New York 10019 USA
2011. 448 pages. US\$ 27.00
ISBN: 978-0-7679-3048-2

A four-in-one biography of William Whewell, Charles Babbage, John Herschel and Richard Jones, this book looks at how the lives of these 19th-century scientists intertwined. Author Laura Snyder describes their personal lives, accomplishments and influences on science and economics.

Contents:

- Prologue: Inventing the Scientist
- Waterworks
- Philosophical Breakfasts
- Experimental Lives
- Mechanical Toys
- Dismal Science
- The Great Battle
- Mapping the World
- A Divine Programmer
- Sciences of Shadow and Light
- Angels and Fairies
- New Worlds
- Nature Decoded
- Endings
- Epilogue: A New Horizon
- Notes, Bibliography, Illustration Credits, Index

📖 *Philosopher and science historian Snyder . . . has written an impressive biography of four Victorian polymaths. . . . The collaborations of these remarkable men in economics, science, mathematics, and social policy, particularly their development of institutional reform . . . virtually created the 'profession' of science with its institutions, curricula, norms, and methods. . . . The men's entangled lives and work make engaging and informative reading. Highly recommended.*

Skiff PD: *Choice* 49, no. 1 (September 2011): 136–137.

📖 *Laura J. Snyder's The Philosophical Breakfast Club describes how . . . Babbage, Herschel, Whewell and Jones set out to modernize the way science in England was taught, organized and conducted—to elevate science from an avocation into a specialized profession. Ms. Snyder, a scholar of Victorian science and culture at St. John's University in New York, shows a full command of the scientific, social and cultural dimensions of the age.*

Hirshfeld A: "An Engine of Perpetual Revolution," *The Wall Street Journal*, (February 26, 2011), <http://online.wsj.com/article/SB10001424052748704546704576150763073274594.html> (accessed September 16, 2011).