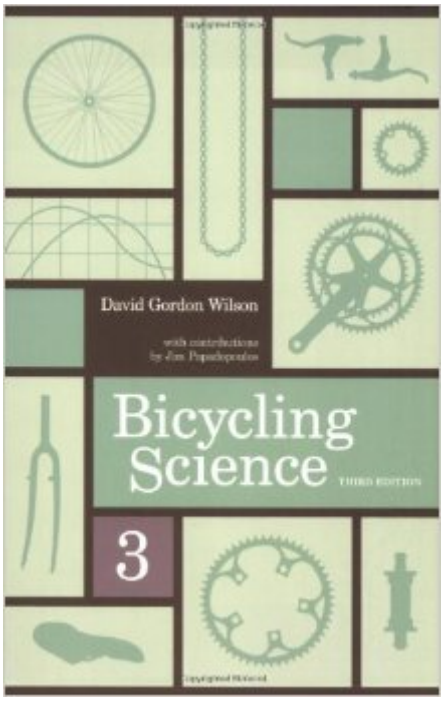
# Bicycling Science (MIT Press)



## Synopsis

The bicycle is almost unique among human-powered machines in that it uses human muscles in a near-optimum way. This new edition of the bible of bicycle builders and bicyclists provides just about everything you could want to know about the history of bicycles, how human beings propel them, what makes them go faster, and what keeps them from going even faster. The scientific and engineering information is of interest not only to designers and builders of bicycles and other human-powered vehicles but also to competitive cyclists, bicycle commuters, and recreational cyclists.The third edition begins with a brief history of bicycles and bicycling that demolishes many widespread myths. This edition includes information on recent experiments and achievements in human-powered transportation, including the "ultimate human- powered vehicle," in which a supine rider in a streamlined enclosure steers by looking at a television screen connected to a small camera in the nose, reaching speeds of around 80 miles per hour. It contains completely new chapters on aerodynamics, unusual human-powered machines for use on land and in water and air, human physiology, and the future of bicycling. This edition also provides updated information on rolling drag, transmission of power from rider to wheels, braking, heat management, steering and stability, power and speed, and materials. It contains many new illustrations.

## Book Information

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## Customer Reviews

Reviewed by Dr. Andreas Fuchs, Berne, Switzerland, August 2004Long-awaited for Bicycling Science 3 is finally here: 22 years after the second edition was originally published! A main question

for the reviewer was therefore: Will the 3rd edition of Bicycling Science consider the key-developments that happened in this field during the full age of the desktop computer in a wisely weighted manner? This question is a fair one since Bicycling Science ranks among the most important books in the field of cycling!The new, third edition of Bicycling Science (BS) contains main chapters about: History, human power generation, thermal effects on power production, power and speed, bicycle aerodynamics, rolling (tires and bearings), braking, steering and balancing, mechanics and mechanisms (power transmission), materials and stresses, unusual human-powered machines, and human-powered vehicles in the future.Compared with BS2, BS3 has relatively more content in the chapters "human power generation" and "steering and balancing". BS3 discusses relevant results of work physiology in much more detail than BS2. Since bicycling science is a wide field it is a wise decision to involve co-authors; in the "steering and balancing"-chapter Jim Papadopolous vast experience with this main topic shines up and is, at least by the reviewer, very much appreciated!After reading BS3, the question put up by the reviewer at the beginning of this review receives an overall positive answer: D.G. Wilson lists many new references; as a very serious observer of the field of bicycling science Wilson identified the important developments and discusses them accordingly.

Prof. Wilson is well-respected in the engineering community, and this book is the best we have on the topic. Alas, even though Americans can land a man on the moon, we don’t currently have a comprehensive, accurate computer simulation of the bicycle, rider, terrain, and atmospheric condition suitable for design optimization. Bicycle science is still very empirical! Contrast this with automotive engineering, aerospace engineering, watercraft engineering, and rail travel engineering (although to be fair, there is no Defense Department money for bicycle advancements). As a systems and mechanical engineer in industry (but not the bicycle industry) I’ve written numerous computer simulations for all kinds of machines and processes; my engineering doctoral dissertation was on the detailed computer simulation of a modified gas turbine engine (published as Theory and Design of the New Rational Combustion Engine)--so it rather amazes me that we don’t have something comparable for bicycle design. Prof. Wilson candidly states on p. 365 that "...expert application of engineering methods has played very little part in bicycle design." and on p. 282 contributing author Papadopoulos states that "...most [dynamic] analyses are incorrect, either because of faulty methods or because of errors in algebra" (and this at a time when theoretical physicists are promolgating theories to the thirteenth decimal place).The authors present some of the simple equations, but don’t number them, and there are some symbol mistakes (e.g., on p. 242

an equation is missing a couple of divisor signs and lacks a negative sign at the beginning). Symbols are defined at the end of the book, rather than at the beginning or end of each chapter.



Bicycling Science (MIT Press) The Bicycling Guide to Complete Bicycle Maintenance & Repair:Â For Road & Mountain Bikes (Bicycling Guide to Complete Bicycle Maintenance & Repair for Road & Mountain Bikes) Zeitmanagement mit Microsoft Office Outlook, 8. Auflage (einschl. Outlook 2010): Die Zeit im Griff mit der meistgenutzten BÃ  rosoftware - Strategien, Tipps ... (Versionen 2003 - 2010) (German Edition) ThermoPoetics: Energy in Victorian Literature and Science (MIT Press) The Bicycling Guide to Complete Bicycle Maintenance & Repair: For Road & Mountain Bikes The Bicycling Big Book of Cycling for Beginners: Everything a new cyclist needs to know to gear up and start riding Cycling: Bicycling Made Easy: Beginner and Expert Strategies For Performing Better On Your Bike (Cycling Training For Fitness & Sports Competition Beginners & Expert) The Bicycling Big Book of Cycling for Women:Â Everything You Need to Know for Whatever, Whenever, and Wherever You Ride The Bicycling Guide to Complete Bicycle Maintenance and Repair: For Road and Mountain Bikes(Expanded and Revised 5th Edition) Bicycling Complete Book of Road Cycling Skills:Â Your Guide to Riding Faster, Stronger, Longer, and Safer Backroad Bicycling in the Blue Ridge and Smoky Mountains: 27 Rides for Touring and Mountain Bikes from North Georgia to Southwest Virginia Bicycling Salt Lake City: A Guide To The Area's Best Mountain And Road Bike Rides (Where to Bike) Backroad Bicycling in the Finger Lakes Region Exploring the Yellowstone Backcountry: A Guide to the Hiking Trails of Yellowstone with Additional Sections on Canoeing, Bicycling, and Cross-Country Skiing (A Sierra Club totebook) The Voice in the Machine: Building Computers That Understand Speech (MIT Press) Play Between Worlds: Exploring Online Game Culture (MIT Press) Persuasive Games: The Expressive Power of Videogames (MIT Press) Critical Play: Radical Game Design (MIT Press) Beyond Barbie and Mortal Kombat: New Perspectives on Gender and Gaming (MIT Press) Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design (MIT Press)