

The Weekly Newsmagazine of Science

SCIENCE NEWS

February 22, 1997
Vol. 151, No. 8
Pages 113-128

Aging's Toll on the Prostate

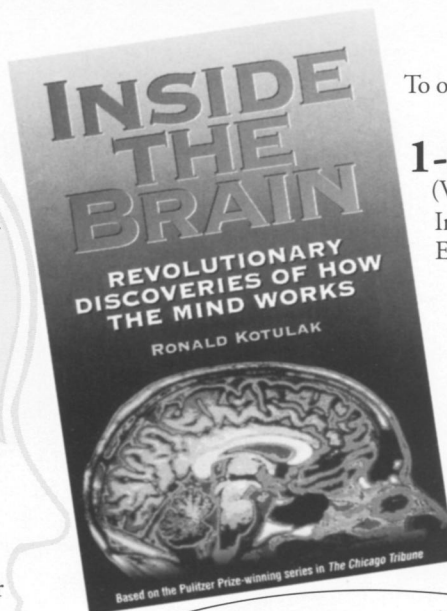


Every day, it happens to you and to everyone you know. Yet scientists have long been puzzled about how any human being—with thousands of muscles, scores of organ systems, 100 billion brain cells, and hundreds of trillions of connections between these cells—achieves consciousness, reason, memory, and language.

In *Inside the Brain*, Pulitzer prizewinning science writer Ronald Kotulak takes an in-depth look at the latest scientific findings through interviews with more than 300 researchers. In easy-to-understand text, he explains how scientists have changed their once-held belief that brains learn from a pre-set, unchangeable set of rules. The brain, writes Kotulak, constantly undergoes physical changes as it responds to its environment, thus making it possible for us to make changes inside our heads.

Perhaps more important, this enlightening book explores how the brain gets damaged, whether from environmental factors, trauma, or alcohol. The author describes studies that pinpoint how aggression is triggered in the brain and how it might be prevented; how scientists are searching for ways to keep the brain young and healthy; and how the brain heals itself. For the millions suffering from Alzheimer's disease, brain injury, or alcoholism, the implications are staggering.

—from Andrews McMeel



To order by phone from Science News Books, call:

1-800-544-4565

(Visa or MasterCard Only)

In DC area: 202-331-9653

E-mail: snbooks@scisvc.org

Fax: 202-785-1242

Andrews McMeel, 1996

194 pages, 6 1/8" x 9 1/4"

hardcover, \$21.95

Science News Books

InsideBrainH

1719 N Street, NW, Washington, DC 20036

Please send _____ copy(ies) of *Inside the Brain*. I include a check payable to Science News Books for \$21.95 plus \$2.00 postage and handling (total \$23.95) for each copy. Domestic orders only.

Name _____

Address _____

City _____ State _____ Zip _____

Daytime phone _____

(used only for problems with order)
RB2665

Why do we need a theory of complex systems? And how dare the author (with his publisher's consent, no less) give this book such an audacious title as *How Nature Works*. While many theories have been proposed to describe individual complex systems, self-organized criticality is the first general theory of complex systems with a firm mathematical basis.

The discoverer of self-organized criticality, Bak describes a concept that has become increasingly important in science. Many seemingly disparate aspects of the world, from the formation of the landscape to the process of evolution to the action of nervous systems to the behavior of the economy, all share a set of simple, easily described properties. While it is standard to think of these as "emergent properties," clearly the explanation cannot end there. What defines an emergent property?

Punctuated Equilibrium. There are long periods of relative stasis punctuated by crises ("avalanches") of various sizes. These avalanches can be literal, as in a sandpile, or they can be mass extinctions, stock market crashes or rallies, solar flares, or cellular automata.

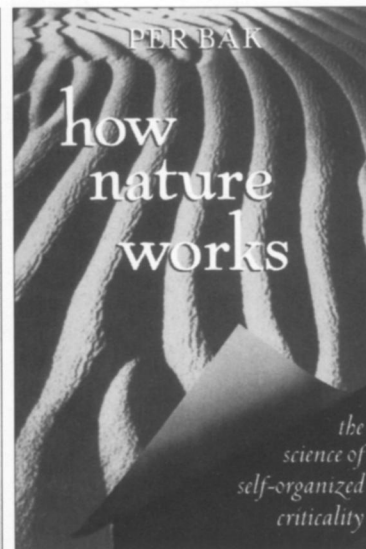
Power Laws. The relation between the sizes of these avalanches can be expressed in a simple exponential equation.

Fractal Geometry. Where a system exists in space, it is self-similar on all scales. (Think of a major river and its tributaries.)

1/f Noise. When a system evolves over time, the record of the evolution is also fractal.

These properties are all so similar, Bak writes, that "they make us wonder if they are all manifestations of a single principle. Can there be a Newton's law, an $f=ma$, of complex behavior?" In *How Nature Works*, he argues that a self-organized critical state is the key to such a principle. Few books offer such a compelling glimpse into the science of the future as this one.

— from Copernicus



Order by phone for faster service!
1-800-544-4565
(Visa or MasterCard Only)

In DC area:
202-331-9653

E-mail:
snbooks@scisvc.org
Fax: 202-785-1242

Copernicus, 1996
212 pages
6 1/4" x 9 3/8"
hardcover, \$27.00

Science News Books

HowNatWorksH

1719 N Street, NW, Washington, DC 20036

Please send me _____ copy(ies) of *How Nature Works*. I include a check payable to Science News Books for \$27.00 plus \$2.00 postage and handling for each book (total \$29.00). Domestic orders only.

Name _____

Address _____

City _____

State _____ Zip _____

Daytime Phone _____

(used only for problems with order)

RB2664