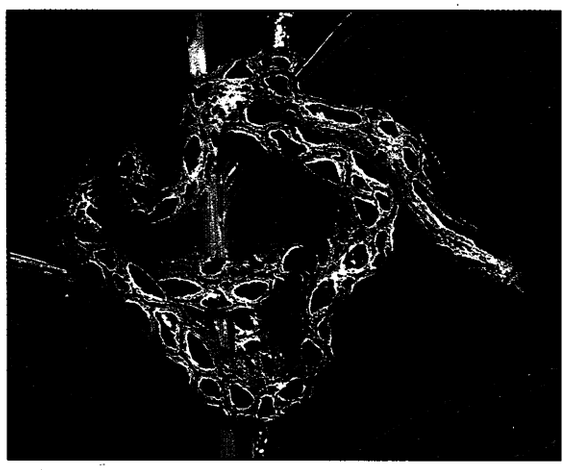
eral other snake books that have appeared in recent years, with a primary emphasis on general biology (especially ecology and behavior) and diversity (a phylogenetically organized exploration of living snakes), but its approach and general themes are very different. First, Greene writes from an intensely personal perspective. Each chapter begins with an anecdote in which he integrates some snake-related experience with other parts of his life. One chapter, for example, begins with Greene wandering through the desert pondering the recent death of his father and exploring the symbolism of his own fascination with deserts and the snakes that inhabit them. Those who advocate the view that professional scientists should be impersonal, disinterested, and objective will be appalled. The reality, though, is that most professional reptile biologists are passionate about their study organisms, and the directions of that passion often determine which kinds of studies are undertaken. Greene's boyish enthusiasms erupt spontaneously in the most unlikely places (who else could wax lyrical about the attributes of the "Central American goo-eaters"?), but the result is a pleasing blend of scientific rigor with unbounded joy at biological diversity.



"Central American Dwarf Boa (*Ungaliophis panamensis*), Costa Rica." [From *Snakes*]

"Russell's Viper (*Daboia russelli*), India, during venom extraction." [From *Snakes*]

The book is also unusual in two other ways. Greene is a powerful advocate of historical (that is, phylogenetically based) approaches to the study of adaptation, and this view permeates the book. Although the "comparative method" has revolutionized the ways in which evolutionary biologists ask questions, Greene's book is one of the first "semi-popular" tomes to blend phylogeny so thoroughly with natural history. The other distinctive feature is visual. Michael and Patricia Fogden traveled the world to photograph snakes for this book, and the result is stunning. The photographs are as notable for their aesthetic impact as for their scientific informativeness. Most of the pictures are "portraits" of attractive or bizarre snake species, often from surprising angles, but always remarkably sharp. My own favorites involve snakes doing things—an eyelash viper lunging at a hummingbird, two male black mambas in a ritualized combat "dance," assorted serpents swallowing assorted prey or adopting threatening stances against a predator. The impact of such images should not be underestimated. The spectacular growth in the popularity of bats among the general public dates from the advent of close-up photography of these strange and wonderful beasts; perhaps the Fogdens' photography can help do the same for serpents.

Inevitably, because the book is very much Greene's view of the snake world, the geographic and phylogenetic coverage is uneven. Greene's passion for large pit-vipers is often evident, and many of his anecdotes involve his two main field studies—of rattlesnakes in the Arizona desert and of bushmasters and the terciopelo in the Costa Rican rainforest. An encyclopedic work such as this also brings into strong focus the grossly uneven distribution of available information. We now know a great deal about the biology of a few species of snakes (such as adders and grass snakes in Europe and rattlesnakes and gartersnakes in North America), but entire lineages remain unstudied. Particularly for tropical snakes and for "basal groups" such as blindsnakes and pythons, our ignorance is overwhelming. Similarly, the broader-level phylogenetic relationships among snake clades remain controversial, a significant problem for an author of Greene's orientation, who needs to identify where a trait arose in phylogeny before he can speculate on its adaptive significance. Unfortunately, Lee and Caldwell's work on the fabulous missing link (*Pachyrhachis*, "the snake with legs") was published too recently for inclusion in the book.

In summary, Greene and the Fogdens have produced a luscious visual feast—a celebration of snake diversity—with extensive factual information intermingled with current concepts in evolutionary biology. Some parts of the book will not be easy to read for the uninitiated—Greene's text is often interspersed with technical terms—but most readers should have little real difficulty. For those of us who share Greene's passion for these mysterious and poorly known animals, this book is undoubtedly a landmark publication.

Richard Shine
School of Biological Sciences,
University of Sydney,
Sydney, NSW 2006, Australia

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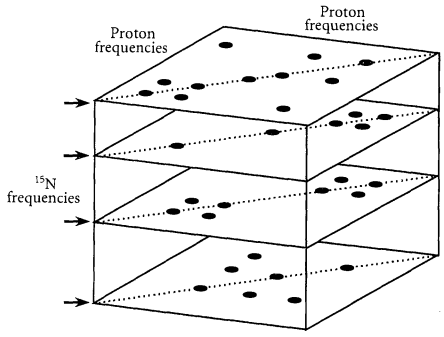
NMR Perspectives

Spin Choreography. Basic Steps in High Resolution NMR. RAY FREEMAN. Spektrum, Oxford, UK, and University Science Books, Sausalito, CA, 1997. xii, 391 pp., illus. $58.50 or £30. ISBN 0-935702-95-4.

Virtually every nuclear magnetic resonance spectroscopist's list of the "greats" in the field would include Ray Freeman, now at Oxford University. Freeman thinks about problems differently from most of his colleagues, and his presentation style and his ability to find simple solutions for complex problems have earned him tremendous respect. This reviewer will always remember the first time he heard Freeman speak, in 1979—introducing the concept of "composite pulses," back-to-back radiofrequency pulses with phase shifts, which create a more uniform rotation than any single pulse could. He made the idea look so simple that we wondered why it hadn't been discovered years earlier. The answer, of course, is that sometimes it takes a special kind of insight to take the first few steps.

Freeman's *Spin Choreography* is worth reading precisely because of such insight. Modern NMR pulse sequences often involve many spin rotations (hence the title) and can appear hopelessly complicat-

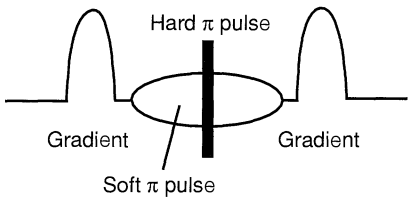


"Schematic representation of an experiment designed to record a two-dimensional proton-proton NOESY [nuclear Overhauser experiment] subspectrum for each of a set of ^{15}N sites excited by a soft radiofrequency pulse. This would represent a significant time-saving compared with the conventional three-dimensional spectroscopy method, where a second evolution period is introduced to allow precession at the ^{15}N chemical shifts." [From *Spin Choreography*]

ed to the uninitiated; Freeman's approach is to isolate many of the "basic steps" to build up a coherent picture. The coverage is broad, but this is not an encyclopedic treatment of magnetic resonance—the field already has an eight-volume encyclopedia. It is also not really a reference book. Even with the subjects he does treat, Freeman makes little attempt to list all the important papers or establish who did what first; the references are usually to the papers he likes best, often many years after the original work. The book is essentially a compendium of topics in high-resolution NMR that Freeman finds particularly interesting, most of which are related to his work over the years.

The emphasis is on presenting the material at an inviting level for beginning students, and thus the approach is intentionally more pictorial than mathematically rigorous. For the most part, the style is both breezy and lucid. After the obligatory review of the vector model, Freeman lays out the product operator formalism in a way that looks very accessible. A chapter entitled "Separating the wheat from the chaff" discusses multiple-quantum filters and pulse gradients in a very clear way. The chapter "In defence of noise" outlines the most basic concepts behind advanced signal-processing methods; "Water" presents the ideas behind simple solvent suppression. In many cases one really feels like one is viewing a concept through Freeman's eyes; thus I think even experienced NMR spectroscopists will find the treatment interesting and even sometimes educational.

Warren S. Warren
Department of Chemistry,
Princeton University
Princeton, NJ 08544–1009, USA



A pulsed-gradient technique, "called WATERGATE, employs a hard π pulse at the same time as a selective π pulse for the water resonance, sandwiched between two equal field gradient pulses of the same polarity. All the coherences that are dispersed by the first gradient pulse are refocused by the second, except for the water signal which experiences no net refocusing pulse. This gradient-recalled spin-echo technique is now one of the most popular schemes for water suppression." [From *Spin Choreography*]

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Browsings

Polio. Thomas M. Daniel and Frederick C. Robin, Eds. University of Rochester Press, Rochester, NY, 1997. viii, 202 pp., illus. $29.95. ISBN 1-878822-90-x.

The history of a now-eradicated disease in America over the past half century, recounted "not comprehensively, but personally" by way of memoirs of three of its victims, two physicians who administered its treatment with the iron lung and other devices, two virologists who studied it in the laboratory, and two public health officers involved in its control in Brazil and elsewhere in Latin America.

Soft Interfaces. The 1994 Dirac Memorial Lecture. P. G. de Gennes. Cambridge University Press, New York, 1997. x, 117 pp., illus. $19.95 or £14.95. ISBN 0-521-56417-4.

An expanded version of a lecture given at St. John's College, Cambridge, covering mobile borders (as between liquids and solids), decorated borders (involving polymer melts), principles of adhesion, and polymer/polymer welding.

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Other Books Received

Fluid Mechanics. Joseph H. Spurk. Springer-Verlag, New York, 1997. xii, 513 pp., illus. $49.95. ISBN 3-540-61651-9. Translated from the German edition by Katherine Mayes.

From Print to Electronic. The Transformation of Scientific Communication. Susan Y. Crawford, Julie M. Hurd, and Ann C. Weller. Published for the American Society for Information Science by Information Today, Medford, NJ, 1996. x, 117 pp. $39.50. ISBN 1-57387-030-7. ASIS Monograph.

From Soul to Mind. The Emergence of Psychology from Erasmus Darwin to William James. Edward S. Reed. Yale University Press, New Haven, CT, 1997. xviii, 283 pp. $25. ISBN 0-300-06967-7.

Granite. From Segregation of Melt to Emplacement Fabrics. J. L. Bouchez, D. H. W. Hutton, and W. E. Stephens, Eds. Kluwer, Norwell, MA, 1997. x, 358 pp., illus. $166 or £99 or Dfl. 260. ISBN 0-7923-4460-x. Petrology and Structural Geology, vol. 8.

Group Theory in Subnuclear Physics. Fl. Stancu. Clarendon (Oxford University Press), New York, 1997. xiv, 421 pp., illus. $145. ISBN 0-19-851742-4. Oxford Studies in Nuclear Physics, 19.

Handbook of Liquid Crystal Research. Peter J. Collings and Jay S. Patel, Eds. Oxford University Press, New York, 1997. xvi, 600 pp., illus. $195. ISBN 0-19-508442-x.

Handbook of Microscopy. Applications in Materials Science, Solid-State Physics and Chemistry. S. Amelinckx *et al.*, Eds. VCH, New York, 1997. 3 vols. Methods I. xxiv pp. + pp. 1-536, + supplementary material,. illus. DM 398. ISBN 3-527-29280-2. Methods II. xxvi pp. + pp. 537-986, illus., + supplementary material. DM 398. ISBN 3-527-29473-2. Applications. xxxii pp. + pp. 1-833, + supplementary material, illus. DM 401. ISBN 3-527-29293-4.

The Hidden Curriculum. Faculty-Made Tests in Science. Sheila Tobias and Jacqueline Raphael. Plenum, New York, 1997. 2 vols. Part 1, Lower-Division Courses. xii, 199 pp. Paper, $24.95. ISBN 0-306-45580-3. Part 2, Upper-Division Courses. x, 135 pp., illus. Paper, $22.95. ISBN 0-306-45581-1. Innovations in Science Education and Technology.

The Honolulu Heart Program. An Epidemiological Study of Coronary Heart Disease and Stroke. Abraham Kagan, Ed. Harwood Academic (Gordon and Breach), Amsterdam, 1996 (U.S. distributor, International Publishers Distributor, Langhorne, PA). xii, 204 pp., illus. $90 or £54 or ECU 69, ISBN 3-7186-5802-x; paper, $33 or £20 or ECU 25, IBSN 3-7186-5803-x.

Horn of Darkness. Rhinos on the Edge. Carol Cunningham and Joel Berger. Oxford University Press, New York, 1997. x, 246 pp., + plates. $25. ISBN 0-19-511113-3.

Immunoassay. Eleftherios P. Diamandis and Theodore K. Christopoulos, Eds. Academic Press, San Diego, 1997. xxxii, 579 pp., illus. Paper, $69.95. ISBN 0-12-214730-8.

Integrin-Ligand Interaction. Johannes A. Eble and Klaus Kühn, Eds. Chapman and Hall, New York, and Landes, Austin, TX, 1997. xiv, 273 pp., illus. $89.95. ISBN 0-412-13861-1. Molecular Biology Intelligence Unit.

Linking Science and Technology to Society's Environmental Goals. Committee on the National Forum on Science and Technology Goals: Environment, National Research Council. National Academy Press, Washington, DC, 1997. xiv, 530 pp., illus. $69.95. ISBN 0-309-05578-4.

The Origin and Evolution of Pacific Island Biotas, New Guinea to Eastern Polynesia. Patterns and Processes. Allen Keast and Scott E. Miller, Eds. SPB Academic, Amsterdam, 1996. viii, 531 pp., illus. $228.50 and Dfl. 365. ISBN 90-5103-136-x.

Progress in Preventing AIDS? Dogma, Dissent and Innovation. David Buchanan and George Cernada, Eds. Baywood, Amityville, NY, 1997. viii, 359 pp., illus. Paper, $44.95. ISBN 0-89503-176-0.

Reactive Transport in Porous Media. Peter C. Lichtner, Carl I. Steefel, and Eric H. Oelkers, Eds. Mineralogical Society of America, Washington, DC, 1997. xiv, 438 pp., illus. Paper, $28. ISBN 0-939950-42-1.

Sidereus Nuncius and Stella Polaris. The Scientific Relations between Italy and Sweden in Early Modern History. Marco Beretta and Tore Frängsmyr, Eds. Science History Publications/USA (Watson), Nantucket, MA, 1997. iv, 168 pp., illus., + plates. $39.95. ISBN 0-88135-188-1. Uppsala Studies in History of Science, vol. 24. From a symposium, Stockholm, Dec. 1995.

The Social Engagement of Social Science. A Tavistock Anthology. Vol. 3, The Socio-Ecological Perspective. Eric Trist, Fred Emery, and Hugh Murray, Eds. University of Pennsylvania Press, Philadelphia, 1997. xii, 718 pp., illus. $69.95. ISBN 0-8122-8194-2.

Structured-Population Models in Marine, Terrestrial, and Freshwater Systems. Shripad Tuljapurkar and Hal Caswell, Eds. Chapman and Hall, New York, 1997. xii, 643 pp., illus. Paper, $39 or £29.95. ISBN 0-412-07271-8. Population and Community Biology, 18.