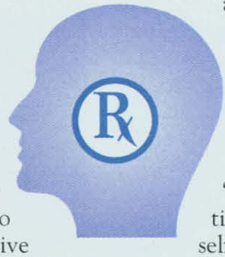
BOOK REVIEWS

Mind and Body



Timeless Healing. The Power and Biology of Belief. HERBERT BENSON, with Marg Stark. Scribner (Simon and Schuster), New York, 1996. 350 pp., illus. $24, ISBN 0-684-81441-2; Fireside paperback, $13, ISBN 0-684-83146-5. Also available in audiocassette and large-print editions.

With this book Herbert Benson, founder of Harvard's Mind/Body Medical Institute at Deaconess Hospital, continues his nearly lifelong search for "something in medicine that lasts." This appears to be the power of belief, which he sees as a natural source of bodily health. This power of belief prominently manifests itself in the placebo effect. In the course of the book it evolves into the power of spirituality, the power of belief in God, and the concept that we are genetically "wired for God."

The book has received considerable media attention. A sign of interest in the subject was the news report last December that nearly 1000 health care professionals (selectively paying either $295 or $525) attended the Harvard-sponsored three-day continuing education course directed by Benson entitled "Spirituality & Healing in Medicine-II."

In reading the book we were cheered when we found Benson acknowledging that the field of alternative medicine suffers from serious lapses in scientific standards and declaring his intention to emphasize significant objective findings (p. 28). Disappointment soon followed, however, with his discussion of the placebo effect, a powerful tool, in Benson's view, with which the mind heals the body.

An early piece of scientific evidence for the placebo effect is, according to Benson, provided by a study in which "women who endured persistent nausea and vomiting during pregnancy were given a drug they were told would cure the problem [while] in fact they were given the opposite—syrup of ipecac—[and] remarkably, the patients' nausea and vomiting ceased entirely . . . because they *believed* they received antinausea medicine" (p. 32). Throughout, Benson refers to the pregnant women in the plural, suggesting an extraordinary outcome for what we are led to believe must be a statistically substantial number of cases. But when we examine the original paper (S. Wolf, *J. Clin. Invest.* **29**, 100 [1950]) we find (thankfully) that only one pregnant woman was the subject of this experiment. (Another woman subject to persistent nausea was studied, but she was not pregnant.)

This beginning prompted us to examine some of the impressive health benefits claimed (pp. 146–48) for the "relaxation response," a meditative procedure Benson promotes in *Timeless Healing*. The procedure has two steps (p. 134): "1. Repeat a word, sound, prayer, phrase, or muscular activity. 2. Passively disregard everyday thoughts that come to mind, and return to your repetition."

One benefit caught our attention: In a study of which Benson was a co-author "Thirty-six percent of women with unexplained infertility became pregnant within six months of completing the program." The implication is that the relaxation response was, at least in part, responsible for reversing the infertility. Unfortunately, perusal of the cited paper (A. D. Domar *et al.*, *Fertil. Steril.* **58**, 144 [1992]) reveals that there was no evidence that the relaxation response improved the conception rate, as the authors are careful to point out there; there were no matched controls, they note, to show what the conception rate would have been without the relaxation response.

Serendipitously, we found a useful control in their study. "Several" women conceived after they were evaluated for acceptance into the program but before the behavioral treatment actually began. Assuming that "several" means at least three, we calculate that (with a large statistical error) the conception rate before treatment began was at least equal to and possibly higher than the rate after treatment began.

Another reported benefit of the relaxation response is that "Patients who had open-heart surgery had fewer postoperative arrhythmias and less anxiety following surgery." However, the original study (J. Leserman *et al.*, *Behav. Med.* **15**, 111 [1989]) demonstrated no significant evidence of benefits. The authors (who included Benson) looked for effects of the relaxation response on at least six physiological variables. Only in one case was there a notable difference from the controls, and this was given a P value of 0.04. However, if one studies six variables the probability is 0.22 that at least one of them would purely by chance show a difference between the experimental and control samples at the $P = 0.04$ level. In other words, the null hypothesis could easily account for one case in six.

A brief respite: "Working people experienced reduced symptoms of depression, anxiety, and hostility." Here is a rewarding field study, complete with controls (P. Carrington, H. Benson, *et al.*, *J. Occup. Med.* **22**, 221 [1980]); it measures the effectiveness of Benson's "relaxation response" and Carrington's "clinically standardized meditation" technique in reducing the self-reported symptoms of stress.

Consistent with his conviction that faith and spirituality make a powerful force that can be harnessed for our benefit, Benson organized at least four expeditions to study Tibetan Buddhism in the Himalayas; his aim was to document the "mind-boggling physical feats that the monks performed by way of the faith factor" (p. 166). One performance particularly captivated him. Monks in a Tibetan monastery, reportedly dressed only in loincloths at a room temperature of 4.4°C, took up cotton sheets from pails of water at 9.4°C and wrapped them about their upper bodies after wringing out the excess water. Benson credits the monks with cryoresistance due to "ancient meditation techniques." In a previous book Benson says, "Although most people would have [promptly] begun to shiver violently when exposed to such cold wetness, these monks didn't react at all" (*Your Maximum Mind*, Random House, 1987, p. 19).

We wondered. So one of us (77 kilograms, 1.79 meters, 67 years) repeated the stunt at nearly identical temperatures (±0.5°C) substituting thin nylon swimming trunks and a tight cotton tennis shirt. The immediate effect was mildly bracing, but not truly uncomfortable (try it in still air, as the monks reportedly did). For the abbreviated 15-minute duration of a first-time trial, this aged beginner experienced no violent shivering or even serious discomfort. None of this would surprise wacky Green Bay Packers fans cavorting bare-chested in wintry Lambeau Field.

Spirituality for Benson is akin to, though not necessarily identical with, religious faith. He suggests that belief in God may be hard-wired into our genetic makeup. Genetic wiring disposing us to faith in supernatural forces might indeed be therapeutic. Because the idea is one of Benson's major themes, it is disappointing that so much of the book's argument for the healing power of faith is anecdotal and fails to deliver on the promise to emphasize significant objective findings.

It is undeniable that the mind affects the

body in many ways. Therein lies a fertile field for rigorous science; also a fertile field for exaggerated claims, uncontrolled studies, flawed statistics, mind-boggling illusions, and anecdotal reports. How will the contest play out? Unexpectedly, Congress voted an increase in the budget of the National Institutes of Health's Office of Alternative Medicine from $7.4 million to $12.0 million. This increase is a mere drop in the bucket for medical research, but it just might turn into a steady drip. Will it nourish or will it tarnish medical science?

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Evolutionist's Worldview

Privileged Hands. A Scientific Life. GEERAT VERMEIJ. Freeman, New York, 1996. xii, 297 pp. + plates. $23.95. ISBN 0-7167-2954-7.

Autobiography is a perilous art, its pitfalls neatly limned in Clive James's observation that "he who abandons his claim to be unique is even less bearable when he claims to be representative." In *Privileged Hands*, however, the unique and the representative are not Scylla and Charybdis, but rather the intricately interwoven themes of a scientific life. Geerat Vermeij is a respected biologist and paleontologist best known for his insightful exploration of the evolutionary interplay between predation and shell form in marine invertebrates. His memoir recounts much that is familiar, even mundane. There are the transitory agonies of thesis research, grant applications, and manuscript reviews as well the more lasting joys of inspiring professors, supportive family, and scientific epiphany. An ordinary tale to be sure, yet the perspective from which Vermeij relates it is unique. He was blinded at age four, and his world is one of sound, smell, and touch. If he has traveled the same road as others, he has negotiated its obstacles differently.

Vermeij's scientific theme is the development of his distinctive worldview on evolution. His fascination with shells began early, when an elementary school teacher brought her collection of seashells to class. Unseduced by color, Vermeij recognized in these oddments a treasure trove of shape and texture. Shells connected him to nature, giving

Geerat Vermeij with his wife, Edith, and daughter, Hermine [From *Privileged Hands*; photograph by Gerry Gropp]

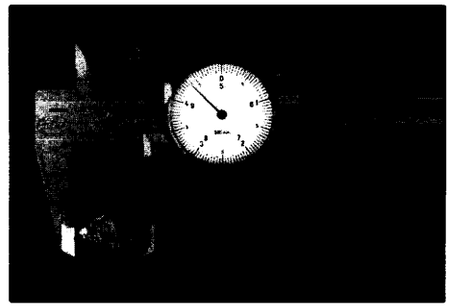
substance and focus to curiosity and wonder. Eventually matriculating at Princeton, Vermeij was tutored by Alfred Fischer, Egbert Leigh, and the late Robert MacArthur, talented teachers who lent biological rigor to his naturalist's passion. For graduate study, he migrated northward to Yale, but compensated climatically by writing his thesis on tropical gastropods.

Early on, Vermeij recognized that position along the tidal gradient correlates well with shell architecture, a finding he ascribed to the biophysical consequences of form. But shells exhibit biogeographic as well as environmental variation. Why should that be? An important clue was provided when he recognized that the relatively thick and highly ornamented snails of the western Pacific live among powerfully built crabs and other shell-crushing animals. If the local ecology of shell form owed much to physical adaptation, the biogeography of shape appeared to reflect the strong influence of predators. In an intuitive leap that I've long admired, Vermeij came to appreciate that variation in time mirrors variation in space. The well-armored snails and burrowing clams of the present oceans diversified only in the Mesozoic Era, concomitant with the evolution of decapod crustaceans, teleost fish, and other molluscivores. Vermeij's 1978 paper on the "great Mesozoic marine revolution" was a key influence in my own scientific development, and his ensuing books on evolution and escalation continue to inspire.

But what drove this evolutionary escalation and why should it be episodic rather than continuous? Having recently discovered the dismal science, Vermeij has begun to develop an economic perspective on evolution in which new energy capital—in the form of global warming, nutrient influx, and sea-level rise associated with submarine volcanism—fuels episodic escalation. This thesis is new and provocative; it may or may not survive critical scrutiny. But, as with all of Vermeij's work, it addresses a big question head on.

If Vermeij's theme is scientific, a social motif pervades the text. Negotiating the world without sight, Vermeij repeatedly encounters well-meaning administrators whose concern for his welfare would put him in a straightjacket. He argues forcefully that the rights of the blind include the right to fail—that in cushioning disabled citizens from failure or disappointment, we rob them of aspiration and opportunity. Vermeij understandably laments the unintended prejudices of others, but here, as in much else, he is more representative than unique—he is well into graduate school before he begins to appreciate that "people with strong religious convictions . . . could be as thoughtful and benevolent as anyone else."

Vermeij has strong opinions on many subjects, and on one page or another we learn what he thinks about a miscellany that ranges from college mixers (he hates them) and hotsput (tastes great) to rock and roll (hates that, too) and book reviews in *Science*



Dial calipers modified to enable by Vermeij to measure shells. "The specimen being measured is *Plicopurpura columellaris*, . . . collected from high-shore wave-exposed rocks near Todos Santos, Baja California Sur, Mexico." [From *Privileged Hands*; photograph by Mary Graziose]

(can be aggravating). But these are minor digressions in the compelling narrative of an ordinary hero, a blind boy from Holland who with family, friends, teachers, and loved ones—but mostly with remarkable will—grows up to pursue a life in science. In recounting his own story, Vermeij reminds us that science is organized wonder pursued by privileged hands.

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