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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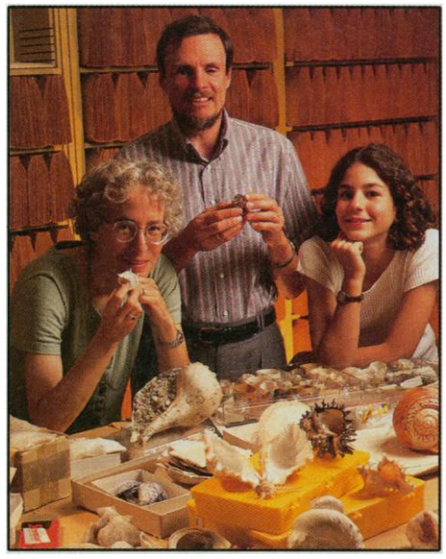
Evolutionist's Worldview

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]

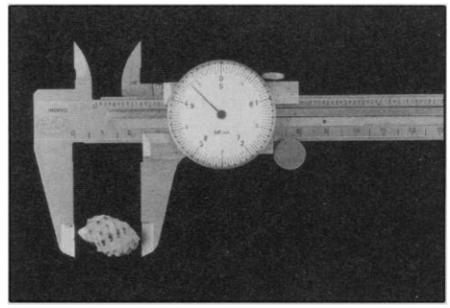
substance and focus to curiosity and wonder. Eventually matriculating at Princeton, Vermeij was tutored by Alfred Fischer, Egbert Leigh, and the late Robert MacArthur, talented teachers who lent biological rigor to his naturalist's passion. For graduate study, he migrated northward to Yale, but compensated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