status of the women already there. Are they getting their degrees or obtaining promotions? A woman scientist will have a much easier time in a supportive environment. Women can always help those with less experience and learn from those with more experience.

Given the overall high quality of A Hand Up, it is disappointing to discover a weakness in the index. More than 50 scientists were interviewed or wrote chapters, or both, for this book. Looking up the names of these scientists in the index does not guide the reader either to their chapters or to their interviews.

Although this book is largely written for women science students, much of the advice applies to all students and to the workplace as well as to school. Teachers and others who want to encourage individuals to pursue science careers will find much of value. This easy-to-read book can be read from beginning to end, or it can simply be picked up and browsed. Useful information leaps from every page. With its complete coverage of mentoring and its abundance of practical advice, this book belongs in the career center of every high school, college, and public library.

BARBARA MANDULA
Committee for the National Institute for the Environment
Washington, DC 20001-4521

ENGENDERING A NEW SCIENCE


Beginning with its title, this book sets out to be provocative. Shepherd, herself a long-time research biochemist who took time off to write this book, says that "several editors...asked for a change in language away from the Feminine/Masculine dichotomy to avoid the emotional baggage that people bring to the word feminine...I finally came to the conclusion that we cannot transcend this polarity until we equally value both parts—otherwise the Feminine will continue to be denied" (p. xiii).

Shepherd enumerates the qualities of femininity (in the Western world view): feeling, receptivity, subjectivity, multiplicity, nurturing, cooperation, intuition, and relatedness. Devoting a chapter to each, she describes the ways she believes science could—and should—be transformed by the incorporation of these qualities. She uses numerous approaches to the analysis of science, ranging from philosophical reflections on dichotomous thinking in science to sociological and even psychological analyses of the relationships of scientists (to one another and to their work).

For example, the chapter "Subjectivity: discovering our selves through the experiment" opens with a discussion of the malleability of human perception, noting that "our nervous system only receives what we have been programmed to see, perceiving only those stimuli that reinforce what we think exists. Psychologists call this premature cognitive commitment" (p. 97-98). The chapter goes on to examine the scientific ideal of objectivity, including a snippet from Sharon Traweek's work (1988) in which "high-energy physicists...cultivated social eccentricity and childish egoism as displays of their commitment to rationality, objectivity, and science" (p. 100). Racing past peer review at a gallop, Shepherd plunges into an uncritical synopsis of Belenky and colleagues' (1986) Women's Way of Knowing, with its "constructivists as passionate knowers, 'knowers who enter into a union with that which is to be known'" (p. 103).

Still within this chapter on subjectivity, Shepherd dodges back into European history to mention the "early costs of objectivity" in the uniformity that the rise of industrialism brought, along with "[t]he adoption of standard techniques, instruments, and communication [that] helped scientists reach a consensus about reality...The objective came to be identified with the mechanical...The interchangeable observer replaced the testimony of a trusted colleague" (p. 107-108). She then draws on the work of Ian Mitroff (1983) concerning the adversarial process of working out scientific theories publicly and the biases this process produces.

Finally, still in one 28-page chapter, "quantum theory as a voice of the feminine and 'subjectivity in chaos theory'" are used to illustrate the vitality of so-called feminine qualities in science. The parts of quantum theory theorizing about particles interacting at a distance show how "[[like chaos theory, quantum theory affirms the fundamental unpredictability of nature (often projected onto the Feminine)]" (p. 114). Shepherd then speculates on scientists' internal motivations for choosing their topics. "As scientists, we project the contents of our individual psyches onto the objects and phenomena of nature we study." She suspects that most scientists, acting unconsciously, choose subject matter that is of personal significance to them for some reason: "[A] project interests us because it is important to us at a deep psychological level. The personal, the subjective, impels science because we are projecting our personal issues and trying to solve them in the lab" (p. 121).

Each of the book's chapters contains this rich, provocative, sometimes superficial mix of many ways of looking at science. The personal and the analytical rub shoulders—that is part of the point. But the stream-of-consciousness quality often is annoying, as Shepherd uncritically pulls in ideas from here and there when they suit her.

"Niels Bohr, one of the pioneers of quantum mechanics, expressed the relatedness of the feminine when he wrote, 'Isolated material particles are abstractions, their properties being definable and observable only through their interaction with other systems'" (p. 131). This passage illustrates Shepherd's penchant for using the pillars of the (masculine) scientific establishment to provide backing for a theory that she hopes will be persuasive. To me, this tactic does not ring true. If the feminine is so widespread, why do we need to help it along? I think Shepherd needs to take a more critical stance: to take such ideas, look at their context, analyze them, and place them..."
back using the history and sociology of science, rather than trying to
swallow them whole to prove her points. She could gain pointers for
such investigation from Helen Longino (1990) and Donna Har-
away (1992), as well as from Evelyn Keller (1984, 1992), whom she cites.

Not only older scientists but current trends in science are used in
Lifting the Veil to illustrate aspects of the feminine. Chaos theory, fuzzy
logic, and quantum theory are taken to be signs of the role of receptivity,
interaction, and subjectivity in science. But as Shepherd acknowledges,
these fields themselves are masculine in the sense that the work there
is being carried out overwhelmingly by men (more so than in some other
fields). Indeed, fuzzy logic is an alternative to either-or logic, which is
characteristic of much of science today. And women have been character-
ized as having a different or more relational logic. It just does not fol-
low that therefore women’s logic and fuzzy logic are alike, still less that
fuzzy logic validates women’s way of thinking or vice versa.

Another maddening and potentially dangerous confusion in
Shepherd’s thought is the wholesale acceptance and reinforcement of the
concept of the feminine. Occasion-
ally, she nods to the idea that women’s personal characteristics are made,
not born, and that these valuable feminine qualities are those of the
species, not just of women. How-
ever, often the repeated references to feminine qualities makes these
qualities seem innate, so that a quick read of the book might lead some
to conclude that Shepherd is saying that only women can clean up the
mess science has made of the world—not the message that I think she
wants to convey.

Shepherd is strongly influenced by her own experience with Jungian
analysis. At times, I find her use of introspection compelling, as when
she describes and analyzes her own understanding of why and how she
does science. On the other hand, I
found the sections on Jung’s theory of psychological types to be tedious,
sketchy, uncritical, and dogmatic. Fortunately, it is not necessary to
believe (or even to read) these parts to gain insight from Shepherd’s over-
all point that science needs to inte-
grate more diverse human qualities.

This teasing book could prove to be important in the development of
the critical discourse on science. Few of the feminist participants in that
discourse, with the notable exceptions of Anne Fausto-Sterling (a cell
biologist at Brown University), Ruth Hubbard (an emeritus biochemist at
Harvard University), and the late Ruth Bleier (a neurobiologist at the
University of Wisconsin), are them-
selves practicing scientists; most are
philosophers or historians of science,
including some former scientists. Shepherd’s book could be a pivotal work among the insider cri-
tiques, not because the ideas are
fully developed—most are only sketched—but because it can be ex-
tended by others, using its rich web
of associations and suggestions.

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DORMANT THOREAU
SPROUTS AT LAST

Faith in a Seed: The Dispersion of Seeds and Other Late Natural His-

tory Writings. Henry David Thoreau. Bradley P. Dean, ed. Is-

dian Press, Washington, DC, 1993. 283 pp., illus. $25.00 (ISBN

1-55963-181-3 cloth).

Henry David Thoreau, the widely celebrated author of Walden, was

far more than a masterful writer. Thoreau was a gifted naturalist and

one of the first Americans to recog-
nize the importance of Charles

Darwin’s On the Origin of Species.

Like Darwin, A. R. Wallace, H. W.

Bates, and other eminent nineteenth-

century naturalists, Thoreau sought

patterns and processes in nature and,

like his contemporaries, he found

an innate value and beauty in the

natural world. The Concord, Mas-

sachusetts, naturalist recognized a

narrowmindedness that dominates
today’s scientists even more. In his

words, “The man of science, who is

not seeking for expression but for a

fact to be expressed, merely stud i e s

nature as a dead language” (p. 8).

Faith in a Seed, drawn mostly from

Thoreau’s 354-page unpublished Dis-

persion of Seeds manuscript, exam-

ines seed dispersal, seed demography,

and plant succession. The book also

contains an introductory chapter

from the 631-page Wild fruits manu-

script and short chapters entitled

“Weeds and grasses” and “Forest
trees.” Thoreau’s geographical fo-

cus on temperate forests separates

him from many of his nineteenth-
century contemporaries who wrote of

their tropical experiences.

Faith in a Seed may transform his

image as solely a naturalist writer.

At the very least, Thoreau was a

scientific naturalist or perhaps even

an ecologist. He presaged many cur-

rent ideas in plant population biol-

ogy. Regarding mast production,

Thoreau writes, “So far as I ob-

served, if coniferous trees bear much

seed one year, they bear little or none

the next year” (p. 40). His observa-

tions concur with those of the re-

nowned plant population biologist

J. L. Harper: “Most tree species, pa-

ricularly in temperate regions,