ism, and various other kinds of relativism can each be true only if the very thing they claim to be relative is in fact absolute.

Complaining that relativism is self-refuting is the kind of quibbling one has come to expect from philosophers, and it should simply be ignored. Self-refutation is quite acceptable considering the advantages relativism offers. Indeed, it was the same petty philosophical pedantry about whether or not 1 could equal 3, or whether an omnipotent and loving God would allow the torture of children, that eroded belief in God and thus robbed the virtuous of everlasting life in heaven. I’m sure Harris’s arguments will keep some from embracing relativism, but those with political vision and a sense of proportion will not be diverted. Quibbling aside, Harris’s book is not entirely retrograde. For, despite its peculiar title, Against Relativism develops an interesting relativistic view of truth. Harris agrees with C. S. Peirce that the truth is just whatever scientists will believe at the ideal limit of inquiry. Thus, if we will never come to believe anything on some matter—perhaps because there is no relevant evidence—then there is no fact about that matter. Hence, according to Harris, you may think you played solitaire yesterday, but if you don’t have a video of the occasion or some similarly public evidence, then there is no difference between this belief being right and being wrong (pp. 157–160).

It is, of course, a tremendous relief to discover that all those small crimes we commit in private—like playing solitaire or farting in the bath—never really happen. But like other relativists, Harris fails to see the full potential of his view. For there have been many real atrocities, which up until now we have thought it too late to remedy: Jews slaughtered by Nazis, children raped by psychotic criminals, ... the list is endless. But if Harris is right about truth, then we have the means to bring those Jews back to life, to restore the virginity of raped children, and to undo all wrongs. For if we simply destroy the evidence that these atrocities occurred, so that the superscientists at the ideal limit of inquiry will have no belief about them, then, like an unrecorded game of solitaire, they will not have happened. This technique was well known to Stalin and is understood in those offices with a paper shredder, but the present extent of suffering on earth shows that it is still generally underexploited. It can only be hoped that Against Relativism will fall into the hands of those in a position to ignore the world’s most appalling crimes.

J. T. Whyte


Everyone in science studies needs to read this book. It gives the first systematic presentation of Thomas Kuhn’s ideas about science. The exception of Kuhn’s work has encountered two main difficulties: the tendency to misread his early position, and the tendency to ignore his later additions. This book, written with Kuhn’s active assistance, remedies both deficiencies. More important still, it has something new to say about the most intractable problems in the philosophy of science. These problems have reappeared in recent sociology of science, and they bear directly on our understanding of the history and present state of science.

Kuhn did not stop writing in 1970, although to read most philosophical presentations of his work one might think he did. Paul Hoyningen-Huene’s coverage begins with Kuhn’s early work, presenting the fundamentals of the book everyone remembers, but continuing the story to the present day. This scope of sources proves particularly important in understanding Kuhn’s account of conceptual systems, incommensurability, and, hence, knowledge of nature. Major advances in all these topics occur in the sequel to Structure.

Hoyningen-Huene does not present a chronological narrative but tackles the hardest and most interesting questions first. A brief introductory section places Kuhn’s project in its historical setting, emphasizing his commitment to an internalist historiography based on actors’ accounts as a means of avoiding whig history. Hoyningen-Huene then proceeds to a brilliant systematic examination of the two hardest questions in Kuhn’s work: the nature of the world and the nature of knowledge.

Kuhn’s treatment of the “world” problem changed significantly from an account emphasizing perception, in his work until Structure, to an account in terms of conceptual
systems and their properties, in the post-
Structure phase. Huyningen-Huene's con-
bution here is the concept of a "phenomenal
world"—derived from Kant with a tinge of
Husserl—a sum of all possible experiences,
that acknowledges the activity of the know-
ing subject in its constitution. Through the in-
troduction of this concept, in Chapters 2 and
3, Huyningen-Huene is able to capture the
nuances of Kuhn's account and especially the
balance Kuhn has always insisted on striking
between animate and inanimate contributors
to scientific knowledge. Huyningen-Huene
expresses this as the complementary "sub-
ject-sided" and "object-sided" moments in the
constitution of phenomenal worlds. The his-
torian encounters a plurality of phenomenal
worlds in the past of science; during a sci-
entific revolution, the scientific community
(once firmly identified as the actor in scien-
tific change) collectively enters a new phe-
omenal world.

Huyningen-Huene turns frequently to Kant,
and he draws parallels with Hegel, Husserl,
and Heidegger. Readers unfamiliar with the
historical tradition in European philosophy
should not be put off—the exposition is lucid
and self-contained—but perhaps it would be
useful to explain one term borrowed from
Hegel. As used here, a "moment" is an as-
pect of a conceptual whole that could not be
removed without destroying the totality. Thus
the point that the phenomenal worlds in which
scientists work have both subject- and object-
sided moments acknowledges both the insep-
arrability of these components and that
removing either one would preclude any pos-
sibility of scientific knowledge. It follows di-
rectly that Kuhn is not, and never has been,
a relativist or a social constructivist of the type
familiar in sociology of science during the last
decade.

The concept of a phenomenal world is de-
veloped most importantly in Chapter 3, which
brings together Kuhn's ideas on concept ac-
quision. The learning process by which new
scientists are added to existing communities
depends upon the mastery of a set of simi-
larity and dissimilarity relations, which co-
determine perception and the formation of
empirical concepts. Concepts acquired in this
way cannot be defined by necessary and suf-
ficient conditions (hence "the traditional the-
ory of meaning is bankrupt" [p. 98]), and they
carry knowledge in two important forms:
through quasi-ontological commitments and
in simple, implicit, empirical regularities. Here

Kuhn's ideas make contact with recent ad-
vances in psychology. An important direction
for development of these ideas will be to con-
nect them with psychological results on con-
cepts and categories, and particularly on
graded structure, pioneered by Eleanor Rosch.

With phenomenal worlds and Kuhn's ac-
count of concepts in hand, Huyningen-Huene
proceeds smoothly to chapters on the para-
digm concept, normal science, and scientific
revolutions. Again, in his hands the full range
of Kuhn's work takes on the authority of a
system. But perhaps most important are the
clear rebuttals of long-standing and widely held
misreadings of Kuhn. Chapter 6, for exam-
ple, contains specific arguments that Kuhn's
understanding of incommensurability does not
require all concepts to change meanings dur-
ing a scientific revolution, does not entail that
theories are incomparable before and after a
revolution, and does not require revolutions
to be discontinuous.

In place of these philosophical phantasms,
Huyningen-Huene himself identifies various
difficulties in Kuhn's account, ranging from
unfinished business to formidable philosop-
ical problems. Kuhn's work (so far!) leaves
open whether the ultimate categorial ordering
of phenomenal worlds is universal and how
it should be understood. More serious is the
"platform" problem. Historical actors and
analysts have direct access only to their own
phenomenal world, so that all knowledge of
other such worlds, or knowledge of the world
independent of knowing subjects, becomes
problematic. These conundrums are only
slightly mitigated by the recognition that, in
Kuhn as formulated by Huyningen-Huene,
they are new versions of long-standing foun-
dational problems in the European philosop-
ical tradition.

It is here that the constructive proposals of
the book make contact with the research
agenda of contemporary sociology of scien-
tce, which has already conceded the need
for additional study of the world-knowledge
linkage. Both the plurality of phenomenal
worlds thesis and the platform problem raise
difficulties acknowledged in recent sociology
of science—for example, in talk of "alterna-
tion" as the pattern of sociologists' contact
with their subject matter. These difficulties
may lead to a critique of universalistic ap-
proaches and the substitution of a more par-
ticularistic methodology, in the manner of the
later Wittgenstein. Or they may lead to the
development of new approaches to old prob-
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recent ad-

Poet Peter Barker


That science is a male world is well known. How it remains so and what science might be like if feminized are hotly contested. This collection offers two perspectives on the debate: interviews with female scientists and articles (mainly by sociologists) on the role of gender in scientists’ careers.

The articles originated in a series of Macy Foundation-sponsored symposia, and most react to the finding that female scientists publish fewer papers than male peers matched for age, rank, and institution. The authors discuss whether discrimination or self-selection is at fault and examine the impact of reduced productivity on female scientists’ professional status, rewards, and access to resources. Jonathan Cole and Harriet Zuckerman dismiss marriage and motherhood as an explanation of diminished productivity, finding scientist-mothers as productive as single female scientists. Stephen Cole and Robert Floreentine suggest that women’s own devaluation of professional success limits their scientific careers. Helen Aslin, a psychologist, concludes that women are more responsive to colleagues’ interest in their research and more sensitive to negative reception of their results than men. Jonathan Cole and Burton Singer offer a numerical model intended to integrate and test such explanations, by quantifying positive and negative career stimuli and robustness of scientists’ responses to them (for instance, acrality in resubmitting rejected papers). They conclude that small gender disparities accumulate into large differences in career-long productivity, rewards, and advancement.

In reading, I was torn between appreciation that quantifying female scientists’ experience can serve a reform agenda and skepticism that these studies, comparing women to a male norm, adequately capture individual female experience. I relished Mary Frank Fox’s insistence that the same environment may present men and women with different opportunities for collegial interaction, collaboration, and communication.

The interviews marvelously reinforce the point that the female scientist is not the monolith she seems to too many analyses; Salome Waelsch, Andrea Dupree, and Sandra Panem lived different lives, represented different generations of feminist thought, and voiced different perspectives on women in science. Waelsch, a geneticist, was driven from Hitler’s Germany after receiving her Ph.D. and survived twenty-two years as an unpaid or ill-paid research assistant before attaining a faculty position. She identifies gender differences in opportunity, not in the practice of science. Dupree, an astrophysicist, started her career in the vanguard of 1960s feminism and weathered subtle discrimination before becoming associate director of the world’s largest astrophysical research center. She credits behavioral differences, especially in aggressiveness, with substantial effects upon field choice, intellectual style, and professional fortunes. Panem, a pathologist turned venture capitalist, discusses her denial of tenure and subsequent switch into science policy and biotechnological investment. Having served on a committee to examine the tenure process, she is a sophisticated observer of her own experience, faulting herself for accruing insufficient support for risky research.

Interviewers Zuckerman and Cole press their subjects hard for evidence of discrimination, conflicts between child rearing and careers, and gender differences in cognitive style. These are sensitive issues, and I am impressed with the interviewers’ success in eliciting revelations.

Joann Eisberg

Michael E. Gorman. Stimulating Science: Heuristics, Mental Models, and Techno-