

Richard J. Herrnstein, who think psychological models do even better.) Economists can say interesting things about consumption when prices change, production when demand changes, and investment when interest rates change.

On the other hand, economists do less well about some macroeconomic questions. They have trouble explaining income distributions, the effect of government spending on economic growth, and the behavior of the stock market. Wilson adds his own list of complaints: Economics cannot say much about the optimal amount of fiscal regulation, optimal population growth, the financial security of citizens, “the roles of soil, water, and biodiversity, and other exhaustible and diminishing resources,” and the significance of “the deteriorating global environment.”

Nowhere in his book does Wilson explain how biology can rescue economics from the problems (some real, some imagined by Wilson) that economics faces. No matter how much we know about soil, water, biodiversity, and the environment, what happens to these things will depend on political choices that people and governments make. And no matter how much biology we know, we will not be able to predict what those choices will be. Governments say things about biodiversity for a variety of reasons—to satisfy domestic interest groups, to extract resources from other countries, to divert attention from their own problems, and (occasionally) to help biological creatures.

No one has been a greater advocate of protecting biodiversity than E. O. Wilson. This is made evident in the last chapter of his book, when he tells us (in a way some scientists would question) his deep feelings about avoiding global warming and preserving biodiversity. I do not think his remarks about social science can be divorced from his views on these policy issues. If what he really wants is to produce a unified science, he has to tell us how science can be unified—even if it leads to conclusions about the environment that he does not like.

The Ants and Us

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Wilson’s scope is broad, his details rich; but what most interests me, naturally, is the central thesis he defends with such passion and eloquence: the unity of knowledge.¹ Is knowledge unified as he supposes? Yes—and no. His thesis has a weaker interpretation, in which it is true, and a stronger, in which, I think, it is not.

There can’t be rival, incompatible “knowledges.” All the truths about the world—about nature and culture, ethics and ecology, law and literature, etc.,

etc.—must, somehow, fit together. *Inter alia*, biology should interlock with sociology, history, and so on, by illuminating the evolutionary origins and neurophysiological underpinnings of human nature and human beings' distinctive capacity for language, art, music, literature, law, religion, inquiry. Wilson's first explanations of "consilience," the fine word he borrows from Whewell, as the "jumping together" of previously unrelated facts and theories (8), as requiring consistency and connectedness (10), suggest this modest kind of interpretation. On this construal, consilience seems to be essentially the same idea as I have expressed by the phrase "explanatory integration," and likened to the mutual support among intersecting crossword entries²—as, e.g., a chemical test for the age of paper and ink, and internal clues from the text, might "jump together" to confirm the date of a historical document.

But mostly Wilson gives "consilience" a stronger, reductionist interpretation, assuming that all the truths about the world must fit together as biology relates to chemistry and chemistry to physics—as if the entries in the enormous crossword on which everyone is working who tries to figure out how some part or aspect of the world is, must all be in one privileged language and hinge on their intersection with a few long, central entries. This reductionist agenda predominates; but when Wilson turns to the mind, culture, ethics, etc., it runs into the difficulties posed by the interpretive and the normative, and you get tantalizing glimpses of a less ambitious, but more plausible, integrationist picture.

In response to danger, an ant emits pheromones which alert others, "say[ing] to other ants, in effect: *danger, come quickly*; or *danger, disperse*" (70). This illuminates the similarities between the ants' "semiotic web" and the mesh of language, laws, customs, rituals, traditions, literature, etc., that constitute a human society. But—as that "in effect" here half-acknowledges, and as Wilson's later discussion (131 ff.) of human beings' unique capacity for language and culture reveals—at the same time it masks the differences between an ant emitting pheromones and, say, a bank clerk pressing the alarm button, or a soldier calling to others, "Danger! Disperse!"

Unlike ants, etc., we humans represent the world by conventional signs—words, drawings, signals, maps, etc.—and form complex beliefs, intentions, goals. So there is a significant divide, not precisely between the natural and the social sciences, but within, e.g., anthropology or geography, between their physical and their sociological sides; and, within psychology, between those parts that investigate creatures not capable of conventional sign use, or non- or pre-representational aspects of the human mind, and those that study human cognition, emotion, interaction, as mediated by symbols. People's beliefs, hopes, fears, representations, are part of the subject-matter of interpretive social science, as they are of history and of legal and literary scholarship, but not of physics or chemistry.

But, after all, aren't people's beliefs, hopes, fears, etc., just physical states of their brains? Again: yes—and no; it depends what force you give that “just.”

Discussing the cross-cultural ubiquity of snake-symbolism, one of his paradigms of the influence of biology on culture, Wilson promises an analysis of a magician's snake-dream “down to an atom” (71). But no such analysis is forthcoming; in fact, Wilson soon concedes that “the neural pathways of snake aversion have not been explored” (79). My believing that snakes are dangerous involves a complex, federal, multi-form disposition to utter and/or assent to various sentences in languages I understand, to run away from snakes, to shudder at snake-pictures, and so forth. So the relevant description of the neurophysiological configuration that constitutes my belief will have to refer to the world, to patterns of verbal behavior in my linguistic community, and so on (not just, as Wilson's proto-Lockean account of meaning suggests, to internal mental images or “nodes”). “The mind is bound by the laws of physics” (118); yes. “Every mental process has a physical grounding and is consilient with the natural sciences” (96); yes and no—it depends what you mean by “consilient.” It's all physical, all right; but it isn't all physics.

Wilson tells us that consciousness “consists of the parallel processing of vast numbers of...coding networks” (109), “is the virtual world composed by the scenarios” created by this processing (110), “is the specialized part of the mind that creates and sorts scenarios” (113); prompting the unkind question, “OK: which is it?—the process, the product, the part of the brain that does the processing, or what?” But a little later, almost as an aside, he acknowledges the very point I have been struggling to articulate. On page 119 he had described free will as an illusion; but on page 120 he writes that “there can be no simple determinism of human thought, at least not in obedience to causation in the way physical laws describe the motion of bodies,” because the contents of the mind evolve in accordance with the unique history of the individual. This is exactly right; and exactly why the interpretive poses a problem for the reductionist agenda.

Wilson doesn't discuss logical or epistemic norms; and he treats moral norms in the same chapter as religion. Still, that chapter begins promisingly, distinguishing the question of the foundations of ethics from the issue of theism. But, as Wilson's dialogue between the Transcendentalist and the Empiricist opens, his Transcendentalist is presented as a theist—creating the impression that we must either accept a divine-command theory, or else agree that ethical *oughts* are, as Wilson maintains, nothing but biological *is's*. But this is a false dichotomy; which is perhaps why Wilson seems to run together the question of the origin of ethical norms with the question of their justification, and to veer away from the strong thesis that ethical norms are reducible to biology to the weak thesis that ethical norms must be consistent with what biology tells us about human nature.

When Wilson writes (251) that “*ought* is just...a word that denotes what

society first chose...to do, and then codified," you half-expect a relativist conclusion. But he goes on to describe the moral reasoning of modern societies as "a mess" (254), and the use of natural-law theory to justify colonial conquest, slavery, and genocide as "perverted" (239); and he had already explicitly repudiated moral relativism (185). Maybe he is covertly relying on the assumption that, if ethical codes are not divine but human in origin, they can be justified only by their conduciveness to human flourishing. But he doesn't say, and I can't see, how this assumption is to be reduced to biological *is's*. Perhaps that's why he hedges: "one code of ethics is not as good—at least, not as durable—as another" (264, my italics).

Detailed investigation of the neural and endocrine responses of the moral sentiments, Wilson suggests, is one of the most urgent tasks of scientific ethics. Not surprisingly perhaps, he doesn't say how such neurophysiological investigation would help settle whether moral values are relative, or disentangle the perversions of contemporary moral reasoning, or clarify debates about abortion or capital punishment, or illuminate what is hideous about the practice of genital mutilation of little girls.

Unlike some contemporary feminists, I don't doubt that knowledge of our own evolution and of other animal societies can contribute to our understanding of our own complex social interactions. But when Wilson writes (169–70) that, from "nuances" of the fact that a female's investment in reproduction is so much larger than a male's, it has been "predicted" that men will be promiscuous and ruttish, women sexually coy and reserved, I'm puzzled and—well, a bit bothered. What part of the argument depends on the differential investment of physiological material (one of relatively few eggs versus one of gazillions of sperm), I wonder, and what on differential investment of time? Is either sufficient, or are both necessary—or are they invariably found together? How do men's concern with paternity (170) and preference for virgins (232) fit in? Why don't tomcats share that concern/that preference? Doesn't the investment analogy suggest, as Sulloway says,³ that males can afford to mate with any female who allows it? What are the "nuances" that square the "predictions" Wilson mentions with those innocently promiscuous female (and male) bonobos I read about recently, or with those touchingly monogamous male (and female) penguins I once saw on television? Unfortunately, Wilson doesn't say.

And why, I wonder, if women are by nature sexually reserved, have so many societies enforced female chastity by cruel practices and laws? Are we to extrapolate from Wilson's answer (178–79) to Freud's parallel question about incest: incest is repugnant, and we condemn it, *because* it is unnatural? Does Wilson think the investment theory justifies a double standard of sexual morality, as, he claims, ethical questions about incest can be settled by biology? Again, unfortunately, he doesn't say.

I am dismayed, as Wilson is, by the factitious despair of the possibility of

attaining truth by investigation which is now in vogue. One source of this despair is the “passes for” fallacy: the inference from the premise that what passes for truth, known fact, evidence, etc., is sometimes no such thing, to the conclusion that the notions of truth, fact, evidence, etc., are mere rhetoric serving the status quo or popular prejudice. Still, though this now-ubiquitous argument is not only fallacious but self-defeating, we shouldn’t forget that its premise is true; nor that those who believe in the possibility of attaining the truth by investigation, as well as those who deny it, aren’t always sufficiently attentive to the distinction Wilson makes when he writes (147) of “what we know or (to be completely forthright) what we think we know.”

I believe, as Wilson does, that all the truths about the world must, somehow, fit together. But we shouldn’t forget that a heterogeneous true description of the world is no less true for its heterogeneity; any more than a map which superimposes a depiction of the roads on a depiction of the contours of the relevant terrain (and integrated in virtue of the fact that, e.g., the roads go around the lake, through the pass in the mountains...) is less accurate for its heterogeneity.

But in the end Wilson’s book reminds me less of such an integrated map, than of those postcards of The View From New York. It is a particularly fine example of the *genre*; but for just that reason it leaves out a lot about the interpretive Indianas, Idahos, and Iowas and the normative New Jerseys, North Carolinas, and Nebraskas that must, somehow, also fit on the map of the territory of the intellect.

Notes

1. But perhaps I have an obligation to mention, for the record, that “warranted assertibility” is Dewey’s phrase, not James’s; and that it was Hume, not Moore, who first drew attention to the gap between “is” and “ought.”
2. Haack, *Evidence and Inquiry: Towards Reconstruction in Epistemology* (Oxford: Blackwell, 1993), chapter 4; “Puzzling Out Science,” *Academic Questions* (Spring 1995): 20.
3. In his discussion of the work of William Hamilton (originator of the investment analogy) in “Darwinian Virtues,” *New York Review of Books*, vol. 45, no. 6, 9 April 1998, 34.

The Case for Consilience: A Summation

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If universal consilience is correct, the boundary separating the natural sciences from the social sciences and humanities is not an epistemological