BIOLOGY, BEHAVIOR, AND CRIMINAL LAW: SEEKING A RESPONSIBLE APPROACH TO AN INEVITABLE INTERCHANGE

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INTRODUCTION

This issue of *Vermont Law Review*—and the April, 1997 symposium on Biology, Behavior and the Criminal Law which preceded it—poses two basic questions. First, is there value in using the emerging insights of biology about behavior in understanding the problems of the criminal law? Second, if such uses are valuable, how is the inquiry to be appropriately conducted? In planning the symposium, the *Vermont Law Review*, together with its co-sponsor, the Gruter Institute for Law and Social Research, sought to provide a socially responsible context for discussing these issues. I was fortunate to work with the 1996-97 Editorial Board in helping to plan the symposium around this dual objective.[1]

This Essay will not explore particular applications of biological thinking to problems of criminal law—that task is left to others in this volume. Rather, it examines the enterprise itself in light of the two basic questions posed above. As to the first, the encounter between biology, behavior, and law is inevitable. I explore the traditional social science bent of legal scholarship, and suggest the useful role that biologically-informed views of human behavior can play in adding to our understanding; the encounter can bear significant fruit. As to the second question, I examine some of the objections which have been raised to the use of biology in studying human behavior. On two of the most vexed issues—race and gender—the law itself provides useful cautionary tools for evaluating proposed applications. Finally, I suggest some common-sense principles for responsibly carrying forward the discussion.

Biology is, in one sense, always around us. In the last few years, an awareness of biology—both around us *and* within us—has become more and more pronounced. Biology's advances cascade across such general scientific

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1. This also represents something of a personal goal. During the planning of this conference, I took some pride in a colleague's somewhat incredulous, and probably inaccurate, declaration that I was a "P.C. [politically correct] Sociobiologist." Matt Ridely comments on political correctness in this context, calling it "the reverse naturalistic fallacy: arguing from ought to is. Because something ought to be, then it must be." MATT RIDLEY, THE ORIGINS OF VIRTUE: HUMAN INSTINCTS AND THE EVOLUTION OF COOPERATION 257-58 (1996). Perhaps my conclusion that sound science and social responsibility go hand in hand—central to this Essay—falls into this definition.

journals as *Nature* and *Science*, and across a host of specialty publications. The popular press is also up on the trend. Since the beginning of 1997, the covers of *Time*, *Newsweek*, and *U.S. News and World Report* have blazed biological questions and answers, many of them aimed not just at the non-human world of plants and animals, but at the workings of people as well.[2] On the bookstore science shelves, new volumes on human nature abound. Capping this recent activity, *The Economist*, the most intellectually engaged of the news weeklies, had as the cover of its August 30, 1997 issue a picture of Charles Darwin under the heading "Darwin revisited: Humans and their animal instincts."[3]

In this time of scientific advance and popular interest, discussions of biology, behavior, and criminal law would seem natural and inevitable. Both law and biology are deeply involved in humanity's great goal of understanding itself. Surely they can communicate their mutual insights. The fact is, however, that occasions for such communication are still somewhat risque academic enterprises, generating significant heat for their organizers and participants. Nonetheless, the dialog is occurring, both within the academy and in policy forums throughout the wider society. The disciplines of law and biology can each enrich the other. They can also challenge each other, and may even pose some danger to each other. What they cannot afford to do is ignore each other.

I. LAW IS A THEORY SPONGE

Law is constantly in search of theories of human behavior, soaking them up like a sponge. Since the days of C.C. Langdell in the latter half of the last century, American legal studies have styled themselves as a "scientific" endeavor, at least in the sense of involving systematic, abstracted study. As Langdell himself put it in often-quoted lines:

> I have tried to do my part towards making the teaching and the study of law in [Harvard] worthy of a university. . . . To accomplish these objects, so far as they depend upon the law school, it was indispensable to establish at least two things—that law is a science,

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2. *See, e.g.*, Sharon Begley, *Little Lamb Who Made Thee*, NEWSWEEK, Mar. 10, 1997, at 53; Wray Herbert, *Politics of Biology*, U.S. NEWS & WORLD REP., Apr. 21, 1997 at 72 (containing a particularly inflammatory cover picture of a baby in prison clothes next to the headline "Born Bad?"); Michael D. Lemonick, *The Mood Molecule*, TIME, Sept. 29, 1997, at 74; J. Madeleine Nash, *Addicted*, TIME, May 5, 1997, at 69; J. Madeleine Nash, *Fertile Minds*, TIME, Feb. 3, 1997, at 48; J. Madeleine Nash, *The Age of Cloning*, TIME, Mar. 10, 1997, at 52; Pat Winget & Barbara Kantrowitz, *Why Andy Couldn't Read*, NEWSWEEK, Oct. 27, 1997, at 56.

3. *Darwin Revisited*, THE ECONOMIST, Aug. 30, 1997, at cover.

> and that all the available materials of that science are contained in printed books. If law be not a science, a university will consult its own dignity in declining to teach it. If it be not a science, it is a species of handicraft, and may best be learned by serving an apprenticeship to one who practices it. If it be a science, it will scarcely be disputed that it is one of the greatest and most difficult of sciences, and that it needs all the light that the most enlightened seat of learning can throw upon it.[4]

In Langdell's view this "science" was an exercise in textual criticism, a look at the formal statements and holdings of courts as reported in books to determine the underlying principles guiding the resolution of disputes. The still familiar processes of case briefing and Socratic teaching were aimed at developing the kind of analytical thinking which such a science requires.

Ever since the Realist revolution of the middle of this century, the study of law has viewed itself somewhat differently, not so much as a textual enterprise, but rather as an applied science of human behavior. Previously, the preoccupation had been with the *internal* justifications offered, in differing fashion, by the natural law[5] and positive law[6] traditions. This gave way, for most of the legal academy, to a search for *external* justification and illumination based in the effects which legal measures have both on society and on the various and varied individuals who make up society.

> [Realists] want law to deal, they themselves want to deal, with things, with people, with tangibles, with *definite* tangibles, and *observable* relations between definite tangibles—not with words alone. . . . They view rules, they view law, as means to ends; as only means to ends; as having meaning only insofar as they are means to ends.[7]

A good law, in this view, is no longer one that is somehow innately right, or that has been correctly promulgated, or that has been competently derived through a Langdellian exercise of analyzing a welter of precedent. Rather, it is one that will help to make our lives better. In the pursuit of such laws, the primary subject of inquiry is no longer the virtual world of text, but rather the

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4. C.C. Langdell, *Teaching Law as a Science*, 21 AM. L. REV. 123, 123 (1887).

5. *See, e.g.*, Pavesich v. New England Life Ins. Co., 50 S.E. 68, 69 (Ga. 1905). *See generally* LON L. FULLER, THE MORALITY OF LAW (1969). Among the many summaries of jurisprudential history, L.B. CURZON, JURISPRUDENCE (1979) is particularly accessible.

6. *See generally* JOHN AUSTIN, THE PROVINCE OF JURISPRUDENCE DETERMINED (Wilfred E. Rumble ed., 1995); H.L.A. HART, LAW, LIBERTY, AND MORALITY (1963); HANS KELSEN, INTRODUCTION TO THE PROBLEMS OF LEGAL THEORY (1992).

7. KARL N. LLEWELLYN, JURISPRUDENCE: REALISM IN THEORY AND PRACTICE 43 (1962).

actual world of occurrence and consequence. The science of law has become a science of behavior.

Working toward a goal of better laws—in the Realist sense—by trial and error is probably unsatisfactory.[8] If progress through law, and not despite it, is to be a possibility, legal scholarship must be able to make informed predictions about what better lives consist of and about the steps that legal intervention can take to help achieve them. Thus, a science of human behavior is to law what a science of physical forces is to bridge-building. In each field, you can have small scale success within time-honored, traditional forms without being informed by science, but large-scale, innovative progress would be impossible. The need for a reasonably predictive theory has set off a hunt by legal academics and thinking policy-makers among the disciplines claiming insight into what makes people tick. In defending the sometimes controversial methods of critical legal studies (CLS), Mark Kelman stated: "[S]ince many CLS people are academics, it is appropriate to recall that they are often engaged *as* academics in the perfectly concrete and constructive enterprise of trying to understand human behavior. . . ."[9]

In this hunt to understand human behavior, the law has been a notorious scavenger of theories.[10] It has informed itself from a number of social science sources, borrowing from psychology, sociology, and perhaps most pervasively, economics. Recent critical scholarship has added to the mix deconstructionist theory, feminism, anthropology, African-American and other diversity studies. Each of these approaches, old and new, has had at least its kernel of insight, and each has helped, in more or less incomplete and sometimes conflicting ways, to move the law in slow and halting progression toward a better or, at any rate, more intentional vision of how people work and what society can be.

II. THE ACHIEVEMENTS AND LIMITS OF SOCIAL SCIENCE

The social science models have been quite helpful in some areas, less so in others. Even at their best they paint incomplete pictures. For instance, it is clear that poverty[11] and early childhood experience[12] correlate in a

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8. Some scholars, however, suggest that the trial and error of the common law is actually a pretty good mechanism for surfacing and implementing "better" laws. *See, e.g.*, Richard A. Posner, *The Ethical and Political Basis of the Efficiency Norm in Common Law Adjudication*, 8 HOFSTRA L. REV. 487 (1980).

9. Mark G. Kelman, *Trashing*, 36 STAN. L. REV. 293, 303 (1984).

10. *See* E. Donald Elliot, *The Evolutionary Tradition in Jurisprudence*, 85 COLUM. L. REV. 38, 38 (1985).

11. *See, e.g.*, Robert J. Sampson, *The Community*, *in* CRIME 193, 194-95 (James Q. Wilson et al. eds., 1995).

12. *See* Travis Hirschi, *The Family*, *in* CRIME, *supra* note 11, at 124.

statistically significant way with criminal behavior. But it is also clear that these factors are far from determinative. A multi-factoral process is at work. There is room for adding to the knowledge of these factors, and some of that new knowledge will come from outside a culturally-determined social science. Before turning to biology as a potential further source, however, we should consider the strengths and weaknesses of social science explanations.

At a gross but useful level of oversimplification, the shared starting point of most "traditional" social science is the external observation of human behavior. Humans themselves are a bit of a "black box," a closed system whose internal workings are shrouded, impenetrable, and even irrelevant.[13] Nonetheless, the behavioral results of these workings can be studied. The social scientist looks for patterns in the behavior, then constructs an explanatory structure for the perceived patterns. Drawing on collected data of human activity, the various social sciences have each postulated behavioral attributes to humans, deriving these constructs from a combination of common sense, logic, and statistical inference.[14] Often, however, the "explanation" is really just a description. Labeling is useful, but it often falls short of predictive power.

Linguistics provides a good example of the power—and the limits—of this kind of approach. Classical structural linguistics focused on language as a behavior.[15] Without pretending to understand the internal workings of the human brain that generate language use, linguists were nonetheless able to derive certain predictively useful—although by no means fully-determined—principles about the processes by which languages develop, spread, and modify over time.[16]

Since the workings of the brain were so little understood, efforts to look inside the black box were at best speculative. The most notable effort in this area has centered around the work of Noam Chomsky, who through the latter half of this century postulated the existence of a "deep structure" underlying grammar and linked to basic brain structures.[17] His goal was not so much to deny the usefulness of the externally derived linguistic "rules," although as a

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13. RIDLEY, *supra* note 1, at 258. *See generally* B.F. SKINNER, WALDEN TWO (1948).

14. For an enlightening and unusually readable discussion of the problems of theorizing in the social sciences, see ANDREW SAYER, METHOD IN SOCIAL SCIENCE: A REALIST APPROACH (2d ed. 1972).

15. *See* Leonard Bloomfield, *A Set of Postulates for the Science of Language*, 2 LANGUAGE 153-64 (1926), *reprinted in* 1 READINGS IN LINGUISTICS 26 (Martin Joos ed., 1966). *See generally* LEONARD BLOOMFIELD, LANGUAGE (1933).

16. *See, e.g.*, Yuen-Ren Chao, *The Non-Uniqueness of Phonemic Solutions of Phonetic Systems*, 4 BULL. OF THE INST. OF HIST. & PHIL., Pt. 4 (1934), *reprinted in* READINGS IN LINGUISTICS, *supra* note 15, at 38.

17. NOAM CHOMSKY, ASPECTS OF A THEORY OF SYNTAX 64-106 (1965). *See generally* NOAM CHOMSKY, SYNTATIC STRUCTURES (1957); TERRENCE W. DEACON, THE SYMBOLIC SPECIES: THE CO-EVOLUTION OF LANGUAGE AND THE BRAIN (1997).

partisan he was likely to dwell on their limits, but rather to add further understanding by delving into the mechanics of the organ that was producing the behavior.[18] Chomsky's explanations about language were hugely controversial, in part because of the personalities involved and in part because his attempts to understand the workings of the black box were themselves largely speculation based on external observation.[19]

The black box of human nature has been giving up at least some of its secrets, however, largely through the efforts of research in such biological sub-specialties as evolutionary psychology and neuroscience. These developments have helped scholars such as Stephen Pinker to make more developed, if nonetheless controversial, elaborations on Chomsky's ideas.[20] This history illustrates one of the core assumptions about bringing biological knowledge to a study of human behavior: the underlying architecture of people as biological entities will both affirmatively shape and negatively constrain the repertoire of human action. While that architecture will by no means be the only factor in what those actions might be, any set of explanations which leaves out biology as a factor will be markedly incomplete. This history also illustrates one of the dangers: biology can be selectively or imaginatively used to "justify" ideas that are in fact drawn from societally induced preconceptions. It has been pointed out that biological explanations "risk degenerating into a set of 'just-so' stories: post hoc rationalizations that find fitness maximizing effects for every existing behavior."[21] It is worth recalling, however, that the social sciences are no strangers to "just so" story telling.

Legal academia has found the traditional social science approach congenial.[22] Inspired by a shared intellectual history, the classic Langdellian exercise for the exploration and definition of doctrine has followed analogous principles of pattern recognition, description, and labeling. Concepts such as

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18. *See* DEACON, *supra* note 17, at 103.

19. For a lively description of this controversy generally, see generally RANDY ALLEN THOMPSON, THE LINGUISTICS WARS (1993).

20. *See generally* STEVEN PINKER, HOW THE MIND WORKS (1997); *see also* STEVEN PINKER, THE LANGUAGE INSTINCT: HOW THE MIND CREATES LANGUAGE (1994). A somewhat contrary view, giving a strong evolutionary role to language itself, is offered in DEACON, *supra* note 17.

21. *See* Amy L. Wax, *Against Nature—On Robert Wright's* The Moral Animal, 63 U. CINN. L. REV. 307, 325 (1996); *see also* Cheryl Hanna, *Can a Biological Inquiry Help Reduce Male Violence Against Women?*, 22 VT. L. REV. 333, 334 (1997).

22. *See generally* HUNTINGTON CAIRNS, LAW AND THE SOCIAL SCIENCES (1935); DENIS CAULFIELD HERON, JURISPRUDENCE AND ITS RELATION TO THE SOCIAL SCIENCES (1877); MORRIS L. COHEN ET AL., LAW & SCIENCE: A SELECTED BIBLIOGRAPHY (1980); RICHARD LEMPERT & JOSEPH SANDERS, AN INVITATION TO LAW AND SOCIAL SCIENCE: DESERT, DISPUTES, AND DISTRIBUTION (1986). It is something of a puzzle that the social sciences have not in return made more pervasive use of legal information or data for their exploration. *See, e.g.*, Leonard S. Cottrell, Jr., *The Interrelationships of Law and Social Science*, *in* LAW AND THE SOCIAL ROLE OF SCIENCE 106, 108 (Harry W. Jones ed., 1966).

consideration,[23] *the superego*, and *the patriarchy* are deeply analogous—descriptive labels for perceived patterns drawn from the observation of human behavior which are then turned into predictive theory elements. What each of these lacks is some notion of necessity—*why* is this so?

The problem with these description-turned-explanation theories is illustrated in a non-legal context by considering the eighteenth century knowledge that linked malaria with swampy areas. The correspondence was known, the pattern seen. The appreciation was even put to some use: a good location for a camp was high ground, not boggy areas. What was missing was an understanding of why. The correspondence was generally ascribed to "bad air," i.e., some aspect of the smell that was often associated with swampy areas.[24] Indeed, the very name "malaria" is generally attributed to the Italian word for "bad air." Such an attribution might have been helpful as a description but it was useless as an explanation. What biology added to the account in the last years of the nineteenth century was a more powerful understanding that the cause of the sickness was a microbe, transmitted via mosquitoes, which bred in wet areas, and therefore was far more common around swamps.[25] This added layer did not so much disprove the first set of observations as it provided much greater and more useful depth of knowledge. Social science explanations are often—although by no means always—stuck at the "bad air" level. The correspondence has been identified and labeled, but absent further insight into "why," the predictive power is limited.

III. WHAT BIOLOGY ADDS TO THE PICTURE

Over the past century and a half, evolutionary biology has also been adding its perceptions to our understanding of the workings of the world. The pace of biological discovery has increased over time, to the point now where every week seems to bring some new breakthrough. For the lay person, a thoroughly unscientific review of the Science Section of the *New York Times* gives strong anecdotal confirmation of this.[26] With increasing complexity, nuance, and assurance, biologists have been including humans and human behavior in the sphere of their inquiry.

The great claim of biology is that it gets one at least partially inside the black box, where one can start unraveling the structures and principles that

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23. "Consideration" is one of law's best "just so" stories: an after-the-fact description-turned-explanation, of dubious explanatory powers, turned backwards into an affirmative rule.

24. *See generally Malaria*, 7 NEW ENCYCLOPEDIA BRITANNICA 725 (15th ed. 1987).

25. *See id.*

26. *See, e.g.*, Jane E. Brody, *Genetic Ties May Be Factor in Violence in Stepfamilies*, N.Y. TIMES, Feb. 10, 1998, at C1.

underlie the external patterns of behavior. This added layer of understanding will not necessarily contradict the accepted wisdom of social science explanations, although some will inevitably be called into question. To the extent that the biology is good science, and much of it is,[27] it will inevitably help to deepen our knowledge, to fill in gaps, to give coherent principle to scattered observation. The August, 1997 issue of *The Economist*, which portrayed Darwin on its cover, declared in its lead editorial:

> Recent science shows that, even more than you might suppose, people are animals. Evolutionary imperatives have left their signature on the human mind in ways that are both obvious and subtle, much as they have left their mark on the behavior of other creatures. Like other animals, humans are driven to eat, survive and reproduce—and as science reveals ever more about the complexities of these drives and the behaviour that expresses them in the animal world, it sheds ever more light on human nature.[28]

Just as the completeness and predictive power of the swamp/malaria link was greatly increased by adding detailed biological knowledge to the mix, it is to be expected that adding biology will help to improve our models of human behavior. And nowhere is a model of human behavior more necessary than in a consideration of crime and criminal law. As one recent survey of criminal studies put it: "A conception of crime presupposes a conception of human nature."[29] If one believes, as I do, that any conception of human behavior that is not at least biologically informed must be significantly less complete as a result of the omission, then the potential for a careful and considered look at biology to enrich the law—and in particular the criminal law—looks promising.

IV. THE CHALLENGES AND DANGERS OF BIOLOGY

This story is not without its detractors. To begin, the claims of biology for explaining human actions have sometimes seemed overreaching; insufficiently attuned to the extent that culture, environment, and freewill also play critical roles; and infected with no little bit of hubris. For instance, in his 1975 classic *Sociobiology: the New Synthesis*, Edward O. Wilson, a Harvard

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27. Social science adherents rightly point to some past accepted wisdom in biology now seen as mistakes. The same can be said of many past social science theories (sometimes drawing from the same cause of error as biology). *See, e.g.*, Herbert Hovenkamp, *Social Science and Segregation Before Brown*, 1985 DUKE L.J. 624 (1985).

28. *Darwin Revisited*, *supra* note 3, at 11.

29. MICHAEL R. GOTTFREDSON & TRAVIS HIRSCHI, A GENERAL THEORY OF CRIME 5 (1990).

entomologist and an early leader in looking at behavior from an evolutionary standpoint, laid claim to a huge chunk of intellectual territory:

> Let us now consider man in the free spirit of natural history, as though we were zoologists from another planet completing a catalog of social species on Earth. In this macroscopic view the humanities and social sciences shrink to specialized branches of biology; history, biography, and fiction are the research protocols of human ethology; and anthropology and sociology together constitute the sociobiology of a single primate species.[30]

In his 1978 Pulitzer Prize-winning sequel, *On Human Nature*, Wilson said of a biologically-rooted view of human nature:

> It is the essential first hypothesis for any serious consideration of the human condition. Without it the humanities and social sciences are limited descriptors of surface phenomena, like astronomy without physics, biology without chemistry, mathematics without algebra. With it, human nature can be laid open as an object of fully empirical research, biology can be put to the service of liberal education, and our self-conception can be enormously and truthfully enriched.[31]

Wilson is not alone in such claims. Noted evolutionary theorist Richard Dawkins begins his classic book, *The Selfish Gene*, by declaring: "Intelligent life on a planet comes of age when it first works out the reason for its own existence. If superior creatures from space ever visit earth, the first question they will ask, in order to assess the level of our civilization, is: 'Have they discovered evolution yet?'"[32] Faced with such imperial intellectual claims, it is small wonder that many social scientists viewed the possible contributions of biology to their work with significant suspicion. On the other hand, if intellectual arrogance by their proponents invalidated otherwise plausible ideas, we in academia would have damn little to talk about.

Rather than rushing to embrace these new perspectives, much of social science declared them heretical or worse.[33] "Sociobiology" itself became for

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30. EDWARD O. WILSON, SOCIOBIOLOGY: THE NEW SYNTHESIS 547 (1975).

31. EDWARD O. WILSON, ON HUMAN NATURE 1-2 (1978). In recent years, Wilson has espoused a more inclusive view of the study of humanity. *See generally* EDWARD O. WILSON, CONSILIENCE: THE UNITY OF KNOWLEDGE (1998) [hereinafter Consilience]; Edward O. Wilson, *Back From Chaos*, THE ATLANTIC MONTHLY, Mar. 1998, at 41.

32. RICHARD DAWKINS, THE SELFISH GENE 1 (1989).

33. *See, e.g.*, SOCIOBIOLOGY EXPLAINED (Ashley Montague ed., 1980) (containing essays critical of sociobiology).

many a label of disrepute, and other, less provoking terms were introduced for biologically informed approaches to behavior. As one beleaguered biology proponent joked recently:

> I forgot to enlighten you all on the meaning of the label sociobiologist and the confusing alternatives—apparent alternatives?—such as behavioral ecologist, evolutionary ecologist, and evolutionary psychologist. They have easily identifiable traits. They all have horns, tails, and cloven hooves. That's what distinguishes them from good people. The sociobiologists are the ones who show off their horns, tails and cloven hooves. The others are the ones who try to hide their horns, tails, etc. The three groups that try to hide their real characteristics can then be distinguished from each other by their different degrees of success in hiding their horns, etc. However, I have not quite worked out which of these three groups is best at deception. When I do I'll let you know.[34]

But it is not just turf-protecting and name-calling that has slowed the addition of biology to discussions of human behavior. The pursuit of biologically based insights into human behavior has also drawn criticism from some biologists, rightly concerned that the claims can be overblown and the nuance lost in a drive for popularization.

> As a biologist who makes his living trying to understand how changes in brain cells mediate behavioral differences that are not affected by experience (so-called "innate" or "inborn" behaviors), I clearly believe that it is appropriate to ask questions about biological correlates of any behavior, including those classified as "criminal" or "violent." But I think that those who oversell and misrepresent what is still a very incomplete and parochial body of work relating biology to crime and aggression are doing everyone a great disservice.[35]

Some of the criticism is now out of date. Efforts to link behavior and biology in humans have not stood still over the past twenty years. They have taken many of the legitimate cautions on board and have become much more nuanced and less imperial. What, then, are the sources of the ongoing resistance? Three factors will be examined here: (1) the challenge that

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34. William Irons, *What is a Sociobiologist?* (visited Oct. 24, 1997) <http://www.irasnet@biodec.wustl.edu> (cited with permission).

35. Evan Balaban, *Reflections on Wye Woods: Crime, Biology and Self-Interest*, POL. & LIFE SCI., Mar. 1996, at 87. *See generally* STEPHEN J. GOULD, THE MISMEASURE OF MAN (2d ed. 1996); R.C. LEWONTIN ET AL., NOT IN OUR GENES: BIOLOGY, IDEOLOGY, AND HUMAN NATURE (1984).

biological thinking poses to some of our most strongly held and deeply cherished ideas about human nature; (2) the commonly held misconception that biology is just about genes; and (3) the significant and damaging misuses—mostly now historical—which have been made of biology in justifying a variety of dismal to appalling practices and beliefs.

A. Perceived Challenges to Deeply Held Beliefs

Among the roadblocks that get in the way of a productive interchange between law and biology are some deeply felt, if not necessarily fully rational, challenges from long established beliefs about the basic character of humanity. To begin, some people are very reluctant to consider people as "animals." This is an old problem for human biology, going back to the age of Darwin and beyond: "As a facet of organic nature, subject to mechanistic laws, man no longer seemed such a splendid figure."[36] The need to differentiate humans from "beasts" is strong within most of us, and such attitudes underlie much of the resistence to looking at humans through a biological lens. They are also sometimes coupled with a more generalized suspicion of science and technology, or with a fundamentalist approach to biblical statements about the nature of humankind.[37] A recent article in *The Nation* argues that a "new creationism" of the secular left has emerged from the idea that humans possess an essential difference from the rest of life "a unique and miraculous freedom from biology."[38] As with so much of the biology debate, however, giving nature its due does not necessarily lessen humanity's specialness, nor the essential mystery of our existence. Boston University's Terrance Deacon recently expressed it: "Biologically, we are just another ape. Mentally, we are a new phylum of organisms. In these two seemingly incommensurate facts lies a conundrum that must be resolved before we have an adequate explanation of what it means to be human."[39] The article in *The Nation* reminds us: "We may be, in many ways, constrained by our DNA, but we are also the discoverers of DNA—and, beyond that, the only living creature capable of representing its biological legacy in such brilliant

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36. RAYMOND CHAPMAN, THE VICTORIAN DEBATE, ENGLISH LITERATURE AND SOCIETY, 1832-1901, at 312 (1970).

37. *See* Dennis E. Owen, *Disbelieving the Culture Wars*, 6 U. FLA. J.L. & PUB. POL'Y, 253, 261 (1994). *See generally* Judith A. Villarreal, Note, *God and Darwinism in the Classroom, the Creation/Evolution Controversy*, 64 CHI.-KENT L. REV. 335 (1988).

38. Barbara Ehrenreich & Janet McIntosh, *The New Creationism: Biology Under Attack*, THE NATION, June 9, 1997, at 12.

39. DEACON, *supra* note 17, at 23.

and vastly condensed symbols as 'DNA.'"[40] There is considerable room for majesty and mystery in such views.

Another deep attitudinal objection comes from our belief in progress, and the related possibility of the improvement, or even perfectability, of human beings. If most of our behavior is caused by some interaction of environment, culture and free will, then it is the product of things within human control and, thus, things which we can change through progressive measures such as the kind of law reform dear to the Realist soul. Indeed, a completely malleable, environmentally-determined model of people was the orthodox science of Soviet Communism, an approach which culminated in the activities of Trofim Lysenko, who organized a crusade against classical genetics that lasted into the 1950s.[41] By changing the conditions of ownership of the means of production, communist theory said, a fundamental change would come over not only society and but also the people in it.[42] "Then for the first time man, in a certain sense, is finally marked off from the rest of the animal kingdom and emerges from mere animal conditions of existence into really human ones."[43]

Of course, such hopes are not confined to communist ideology. Optimism about the ability to improve people is widespread across the entire political spectrum, and is at the heart of seeing the American experiment as the "last, best hope of earth."[44] Biology, "biological determinism," and the even more dreaded "genetic determinism," with their odor of immutability and predestination, are set up by many as being necessarily in opposition to the supposedly more "malleable" cultural model.[45] As Timothy Goldsmith, a Yale biology professor and a speaker at the April symposium, puts it:

> "Genetic" and "biological determinism" have come to be code words for forms of behavior that unfold along a fixed path and cannot be significantly altered by environmental contingencies. Any deflection of behavior that seems to involve choice (for human behavior, read "conscious choice") must therefore be something else. As this "something else" is, by definition, not genetic, it

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40. Ehrenreich & McIntosh, *supra* note 38, at 15.

41. *See, e.g.*, Robert N. Proctor, *Lysenko and the Tragedy of Soviet Science*, 55 RUSSIAN REV. 337 (Apr. 1996). *See generally* NIKOLAI KREMENTSOV, STALINIST SCIENCE (1997).

42. *See, e.g.*, B. BAYANOV ET AL., SOVIET SOCIALIST DEMOCRACY 11-22 (1968). *See generally* KARL MARX & FRIEDRICH ENGLES, MANIFESTO OF THE COMMUNIST PARTY (English ed. 1888), *reprinted in* THE MARX-ENGELS READER 469 (Robert C. Tucker ed., 1978).

43. FRIEDRICH ENGELS, SOCIALISM: UTOPIAN AND SCIENTIFIC (1892), *in* KARL MARX & FRIEDRICH ENGELS, BASIC WRITINGS ON POLITICS AND PHILOSOPHY 109 (Lewis S. Feuer ed., 1959).

44. Abraham Lincoln, Second Annual Message to Congress, Dec. 1, 1862, *reprinted in* JOHN BARTLETT, FAMILIAR QUOTATIONS 522 (Emily Morrison Beck ed., 15th ed. 1980).

45. Ehrenreich & McIntosh, *supra* note 38, at 12-13.

> should, according to this fallacious argument, lie beyond the scope of evolutionary biology.[46]

Nonetheless, the Realist hope of societal improvement that impels the search of the law for ever more helpful models of human behavior leads the law back to an examination of biology. Luckily, contemporary approaches to biology and behavior, by and large, emphasize the importance of the environment in interacting with genetic and other biological principles to shape a quite varied end product, reflecting the complex, multi-factoral nature of human behavior. As Goldsmith remarks, "for much of the behavior of higher vertebrates, attributing behavior to either learning or instinct is about as fruitful as arguing whether it is the sugar or the flour that makes the cake."[47]

Another deeply held American belief, which many perceive biology as challenging, is the basic equality of all people. While all too imperfectly realized in our law and society for much of our history, the belief has had recurring power and embodies much of what is best in our country. To the extent that biology is thought (wrongly, as we will explore) to be essentially about entrenched, inherited difference, biology is thought to threaten this belief.

Once again, biology is more of an imaginary villain on this issue than a real one. A biologically-informed view of human behavior is at least as much about similarities broadly shared among people as it is about differences.

> [T]oday's Darwinian anthropologists, in scanning the world's peoples, focus less on surface differences among cultures than on deep unities. Beneath the global crazy quilt of rituals and customs, they see recurring patterns in the structure of family, friendship, politics, courtship, morality. They believe the evolutionary design of human beings explains these patterns: why people in all cultures worry about social status (often more than they realize); why people in all cultures not only gossip, but gossip about the same kinds of things; why in all cultures men and women seem different in a few basic ways; why people everywhere feel guilt, and feel it in broadly predictable circumstances; why people everywhere have a deep sense of justice, so that the axioms "One good turn deserves another" and "An eye for an eye, and a tooth for a tooth" shape human life everywhere on this planet.[48]

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46. TIMOTHY H. GOLDSMITH, THE BIOLOGICAL ROOTS OF HUMAN BEHAVIOR: FORGING LINKS BETWEEN EVOLUTION AND BEHAVIOR 72 (1991).

47. *Id.* at 87.

48. ROBERT WRIGHT, THE MORAL ANIMAL, WHY WE ARE THE WAY WE ARE: THE NEW SCIENCE OF EVOLUTIONARY PSYCHOLOGY 7-8 (1994). *See generally* E. Donald Elliott, *Law and Biology: The New Synthesis?*, 41 ST. LOUIS U. L.J. 595 (1997); Owen D. Jones, *Evolutionary Analysis in Law: An*

And to the extent there are variations between people, we do not need biology to tell us they exist. With or without biology, we can recognize that each of us has strengths and weaknesses that make us unique without necessarily jettisoning a belief in a basic, underlying equality derived from a common, and deeply biological, humanity. "Equal" does not mean "undifferentiated."

B. Biology is Not Just About Genes

An additional misconception about biology is that it is all about genes. This mistake underlies some of the "determinism" concerns already addressed. While an understanding of genes is important, it is only part of a complicated story of interactive processes involving a number of internal and external factors at every stage along the way. As explained by Gillian Einstein, a Duke University neuroscientist who also spoke at the symposium, even such an apparently "genetically determined" trait as gender is in fact the not-so-fully-determined end-result of a highly complex and decidedly malleable process of development.[49]

My own personal, incomplete list of the disciplines—moving from the general to the particular—which must be included in a biologically informed approach to human behavior is a discouragingly long one:

Astrophysics	Neuroscience
Evolutionary Science	Ethology
Biochemistry	Primatology
Genetics	Biological Anthropology
Cell Biology	Evolutionary Psychology
Embryology	Evolutionary Cultural Theory
Anatomy	Sociology
Zoology	History

Its length is one of the better arguments for avoiding looking into biology.[50] Luckily, fruitful knowledge can be gleaned in any of these areas. While the different sub-disciplines are necessarily complementary, they can also be used somewhat in isolation. Thus, the pan-human, evolutionary arguments underlying the Vermont Corrections Department's initiative on Restorative

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Introduction and Application to Child Abuse, 75 N.C. L. REV. 1117 (1997).

49. Gillian Einstein, *Sex, Sexuality and the Brain*, *in* NEUROSCIENCE 529, 531 (Parves et al. eds., 1997).

50. Some scholars have adopted the somewhat grandiose phrase "Epic of Evolution" to encompass much of this frame of reference. See, for example, the website for a November, 1997 conference on the topic, <http://www.aaas.org/spp/dspp/dbsu/evol.htm#conference>.

Justice described by John Perry,[51] do not depend on an understanding of neurochemistry, while the discussion of the effects of lead poisoning on criminality discussed by Roger Masters does.[52] Note that neither of these discussions depends primarily upon genetics.

C. Misuses of Biology

There is an unhappy history associated with some of the attempts to integrate biology into law and public policy. Biological approaches have been abused to justify societal inequities, particularly through arguments that depend upon immutability. Such a history is not unique to biology; social science theories have been abused to justify atrocities as well.[53] This history nonetheless stands as a legitimate caution to proponents, ammunition to doubters, and a red-flag to victims. There are very serious traps to be avoided.

> Evolutionary theory, after all, has a long and largely sordid history of application to human affairs. After being mingled with political philosophy around the turn of the century to form a vague ideology known as "social Darwinism," it played into the hands of racists, fascists, and the most heartless sort of capitalists. It also, around that time, spawned some simplistic ideas about the hereditary basis of behavior-ideas that, conveniently, fed these very political misuses of Darwinism. The resulting aura—of crudeness, both intellectual and ideological—continues to cling to Darwinism in the minds of many academics and laypersons. (Some people think the term Darwinism *means* social Darwinism.) Hence many misconceptions about the new Darwinian paradigm.[54]

This history was more fully explored at the symposium in a presentation by Joan Vogel, whose article *Biological Theories of Human Behavior: Admonitions of a Skeptic* also appears in this issue.[55] The literature on

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51. *See* John G. Perry, *Reciprocity and Criminal Justice: Using Epigenetics to Design a Program*, 22 VT. L. REV. 407 (1997); *see also* Martin Daly, *Evolutionary Adaptationism: Another Biological Approach to Criminal and Antisocial Behavior*, *in* GENETICS OF CRIMINAL AND ANTISOCIAL BEHAVIOR 183 (1996).

52. *See* Roger D. Masters, *Environmental Pollution and Crime*, 22 VT. L. REV. 359 (1997).

53. *See, e.g.*, Hovenkamp, *supra* note 27, at 627.

54. WRIGHT, *supra* note 48, at 7.

55. *See* Joan Vogel, *Biological Theories of Human Behavior: Admonitions of a Skeptic*, 22 VT. L. REV. 425 (1997); *see also* Beverly Horsburgh, *Schrodinger's Cat, Eugenics and the Compulsory Sterilization of Welfare Mothers: Deconstructing an Old/New Rhetoric and Constructing the Reproductive Right to Natality for Low-Income Women of Color*, 17 CARDOZO L. REV. 531, 538 (1996).

eugenics from the earlier parts of this century can be profoundly wrong and disturbing.[56]

Some contemporary commentators have declared such misuses a thing of the past. Certainly this is true for the vast majority of the academic proponents of the use of biology in understanding human behavior:

> It is important to recognize that this "return of biology" is not simply a revival of repudiated ideas, like racism, sexism, or eugenics. The new evolutionary approach to social science has no more place for them than has the currently dominant cultural interpretation. Nor is "the return" an attempt to order society according to hierarchies or other normative outlooks. Social Darwinism was definitely killed, not merely scotched; the story told here of the return of biology does not resuscitate Herbert Spencer. Rather, the true aim of those social scientists who advocate a "return" is to place, once again, the study of human nature within evolution, to ask how human beings fit into that framework which Darwin laid down over a century ago and which very few social scientists consciously repudiate—except when the behavior of human beings is included in it.[57]

This nearly universal abhorrence of eugenics and its related evils in the scientific community has been noted by the press, as has the countervailing tendency of some critics to continue to impute similar motives to contemporary efforts to use biological insights into human behavior responsibility.

> Today eugenics may be universally recognized as an evil, but for many its association with Darwin lingers. As a result, people are unwilling to consider the implications of Darwin's ideas for human behaviour. This is a pity. The association, specious in any case,

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56. *See generally* PAUL POPENOE & ROSWELL HILL JOHNSON, APPLIED EUGENICS (1933); CALEB WILLIAMS SALEEBY, PARENTHOOD AND RACE CULTURE: AN OUTLINE OF EUGENICS (1911). Even more "balanced" books from those times are not immune to the infection by eugenic ideas. *See generally* S.J. HOLMES, HUMAN GENETICS AND ITS SOCIAL IMPORT (1936); H.S. JEANINGS, THE BIOLOGICAL BASIS OF HUMAN NATURE (1930).

57. CARL N. DEGLER, IN SEARCH OF HUMAN NATURE: THE DECLINE AND REVIVAL OF DARWINISM IN AMERICAN SOCIAL THOUGHT at ix (1991). Even taking into account the caution that some of the most egregious contemporary "scientific" racists hold legitimate academic appointments, Horsburgh, *supra* note 55, at 564, they remain a very isolated few. Citing these few to damn the many who violently disagree with their positions is, itself, demagogic. By such an approach, the recent inflammatory statement of Lino Graglia, professor at the University of Texas Law School, that "blacks and Mexican-Americans are not academically competitive with whites in selective institutions" could be used to "prove" the racism of all law faculty. Lino Graglia, *Today's News: Update*, 218 N.Y.L.J. 1 (1997).

> has blinded people to the light that evolution can shed on human nature.[58]

Sadly, however, there remain enough bad actors out there muddying the pond that further discussion on the issue is still necessary.[59]

Among the most notorious of the contemporary examples of such misuse is *The Bell Curve, Intelligence and Class Structure in American Life*, by Richard J. Herrnstein and Charles Murray.[60] It is a viciously destructive work. Starting with an outdated theory of the mind[61] and what has proven to be badly misunderstood evidence,[62] it sets about gratuitously[63] reinforcing some of the worst presumptions of racism, with a seriousness of demeanor that managed to get its invidious message onto the covers of *Newsweek*, *The New Republic*, and *The New York Times Book Review*.[64] The destructiveness of this act was two-fold. First, and most importantly, it gave comfort to racists and insulted and attacked the long-suffering victims of racism.[65] Secondly, it set the cause of the responsible use of biology back significantly. It is sadly not possible to say that *all* such misuses are a part of the past; some are still with us. A responsible approach to mixing law and biology must on the one hand have the tools, and the commitment, to deal with this fringe; and on the other hand

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58. *Darwin Revisited*, *supra* note 3, at 11.

59. For a thorough discussion of contemporary eugenic thinking, see Horsburgh, *supra* note 55, at 555-69.

60. RICHARD J. HERRSTEIN & CHARLES MURRAY, THE BELL CURVE (1994).

61. The notion relied upon in THE BELL CURVE that a general reasoning capacity, measured by I.Q. testing, is largely inherited as some kind of innate capacity is strikingly at odds with the clear trend in neuroscience to the view of the brain as a complicated, multi-capacitied, modular organ. *See, e.g.*, HOWARD GARDINER, FRAMES OF MIND: THE THEORY OF MULTIPLE INTELLIGENCES (1993); MICHAEL S. GAZZANIGA, NATURE'S MIND: THE BIOLOGICAL ROOTS OF THINKING, EMOTIONS, SEXUALITY, LANGUAGE, AND INTELLIGENCE (1992); DANIEL GOLEMAN, EMOTIONAL INTELLIGENCE, WHY IT CAN MATTER MORE THAN IQ (1995); RICHARD M. RESTAK, THE MODULAR BRAIN XVI (1994). For additional criticism, see THE BELL CURVE WARS: RACE, INTELLIGENCE, AND THE CULTURE OF AMERICA (1995); MEASURED LIES: THE BELL CURVE EXPLAINED (Knoheloe et al. eds., 1996); INEQUALITY BY DESIGN: CRACKING THE BELL CURVE MYTH (1996); GOULD, *supra* note 35, at 367-90; Roger D. Masters, *Brain Biochemistry and Social Status: The Neurotoxicity Hypothesis*, *in* INTELLIGENCE, POLITICAL INEQUALITY AND PUBLIC POLICY 141 (1997).

62. *See* Bernie Devlin et al., *The Heritability of IQ*, NATURE, July 30, 1997, at 468. Ironically the environment used here to explode the Bell Curve approach is the *biological* environment of the maternal womb in twins. *See* INTELLIGENCE, GENES AND SUCCESS: SCIENTISTS RESPOND TO THE BELL CURVE 54-55 (B. Devlin et al. eds., 1997).

63. In commenting on the recent developments, Charles Murray disputed the generally held conclusion that their argument depends on a connection between genes and intelligence: "The big misconception about the Bell Curve is that it's about genes. It's not. It's about the role of IQ in shaping social outcomes." Matt Crenson, *Key to IQ?: Environment, Not Genes*, SALT LAKE TRIB., Aug. 2, 1997, at A9.

64. Horsburgh, *supra* note 55, at 565.

65. *See, e.g.*, Derrek Bell, *Racial Libel as American Ritual*, 36 WASHBURN L.J. 1, 2 (1996).

the skills not to throw out the baby with the bathwater. A familiarity with the history of misuse is a good starting point. A knowledge of why the arguments for oppression fail is critical. A program for how to apply this understanding is the final step.

V. CONTROVERSY OVER MIXING BIOLOGY AND CRIME

If such a combination of care and vigorous inquiry is necessary in combining behavioral biology and law generally, there are particular dangers in the criminal law context. Indeed, there was an awareness during the planning for this symposium and special issue that the subject matter could be contentious. Only a few years ago the fears and anger associated with misuses of biology had boiled over in connection with a conference sponsored by the University of Maryland entitled "*Research on Genetics and Criminal Behavior: Scientific Issues, Social and Political Implications*." Originally scheduled for 1992, it was postponed to 1995 and its National Institute of Health funding revoked "following objections by some critics that the conference—by linking genetics with crime—might foster racism."[66] When it was finally held, the Maryland symposium specifically raised the history of misuse. Among the symposium's goals was an examination of:

> [T]he social and ethical implications of research on genetics and crime. Critics and proponents of this research set it against the backdrop of two very different legacies. On the one hand, humanity has a long, dark history of 'discovering' sources of inferiority in certain individuals and groups, then using this 'discovery' to justify gross inequalities and coercive social programs. On the other hand, it has been a hallmark of enlightenment to recognize that undesirable traits and behavior often arise from biological or psychiatric problems, rather than moral defects, and to offer humane treatments rather than impose harsh punishments.[67]

Notwithstanding this declaration that the concerns over misuse would be on the table as an explicit caution, one session was interrupted by shouting demonstrators in the auditorium.[68] The symposium at Vermont Law School

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66. Editorial, *Symposium on the Meaning and Significance of Research on Genetics and Criminal Behavior*, POLITICS AND THE LIFE SCIENCES, Mar. 1996, at 83; *see also* Maureen P. Caffey, Note, *The Genetic Defense: Excuse or Explanation*, 35 WM. & MARY L. REV. 353, 353 (1993).

67. *Symposium on the Meaning and Significance of Research on Genetics and Criminal Behavior*, *supra* note 66, at 83.

68. *See id.*

has also provoked some impassioned criticism, reflected in this issue in Sheldon Novick's *Racial Images of the "Criminal": A Cognitive Disorder*.[69]

It is my belief, however, that biological thinking about behavior and crime need not be racist, even though racism has often sought biological justification. In times of pervasive racism, which have sadly characterized this country for much of its history, just about all of its institutions, to a greater or lesser degree, have been hijacked into the miserable cause of oppression. It is worth remembering that for some time under the separate but equal doctrines of *Plessey v. Ferguson*,[70] the United States Constitution was interpreted to give comfort and support to racist policies.

> The courts must bear a heavy share of the burden of American racism. An outpouring of recent historical scholarship on racism and the American law reveals the outrageous and humiliating extent to which American lawyers, judges, and legislators created, perpetuated, and defended racist American institutions. Legal rules recognized and justified racism. More importantly, legal rules enforced racism by making segregation and the other degradations of racism a legal duty rather than an act of individual free will. In the process they cleared the consciences of white Americans by relieving them of any sense of responsibility for racist practices.[71]

Under better interpretation in a changed society the Constitution and the courts became a weapon against racism. Similarly re-informed, biology has its own potential to become a weapon for justice, particularly working together with the law to enrich each other.[72] But to live up to this potential, the legitimate insights of biology must be on the table.

The law is wise about the well springs of human motivation. It has been described as an evolutionary system of artificial intelligence.[73] Within its sphere, it has the evolved system's strength of robust, if unsystematic, knowledge about the workings of its particular environment. Over time, law has developed considerable insight into the excuses and rationalizations with which people decorate their baser motivations, and this wisdom can help to fortify the scientific as well as the legal community in dealing with those who

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69. Sheldon Novick, *Racial Images of the "Criminal": A Cognitive Disorder*, 22 VT. L. REV. 383 (1997).

70. Plessy v. Ferguson, 163 U.S. 537 (1896).

71. Hovenkamp, *supra* note 27, at 624-25 (footnotes omitted).

72. In countering the thinking of the racist fringes, even such a staunch contemporary anti-eugenicist as Beverly Horsburgh cites better science to counteract parascience. *See* Horsburgh, *supra* note 55, at 539. *See generally* CONSILIENCE, *supra* note 31.

73. *See* E. Donald Elliott, *Holmes and Evolution: Legal Process as Artificial Intelligence*, 14 J. LEGAL STUD., 113-47 (1984).

would still seek to justify bigotry through the guise of science. The safeguards which the law imposes on both racial and gender matters can be usefully invoked in the scientific context. We in the law have models to help us go forward responsibly.

VI. RULING RACISM OFF THE TABLE

There are excellent reasons for banishing race from *biologically* based discussions of human nature. To begin, the idea of race is lousy biology. There are, at a level of gross generalization, *some* geographically distributed differences among people. The anomalous paleness of many people of European origin is an example of this. These differences, however, are largely limited to specific adaptations to specific local conditions, almost always linked to climate, disease, or diet. The European paleness is a local adaptation which has been linked to a seasonally chronic deficiency of sunlight exposure. Pale skin trades increased susceptibility to cancer against the synthesis of sufficient vitamin D to survive the winter months.[74] The idea of a broadly differentiated race based on this limited and isolated trait of diminished sun-block falls apart under scrutiny. First, this kind of relatively local variation simply does not line up with any general pattern of variation: thus, the European sun-screen deficiency is not twinned with a pervasive complex of other traits. Second, the genetic variation within geographic populations, is, on the whole, much greater than variation between populations. The inherited differences between you and your neighbor are likely to be just about as profound as the differences between you and someone from a different continent.

Lionel Tiger, the Rutgers anthropologist, confirmed recently how the failure of race as a biological concept is widely recognized among scientists:

> [I]t seemed worthwhile to [scholars at an international meeting in 1995] to establish once and for all that the notion of race as a real phenomenon is unacceptable. The fact is that all of contemporary population genetics and molecular biology underscores that the 19th century notion of races as discrete and different entities is false. . . . Nearly all the physically observable differences reflect very limited

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74. It is widely accepted that skin pigmentation, through varying levels of melanin, is an adaptation to sunlight exposure-balancing, among other things, vitamin D_3 biosynthesis and skin cancer. *See* A. Gedeon Matoltsy, *Dermis*, *in* BIOLOGY OF THE INTEGUMENT, 2 VERTEBRATES 289-90 (J. Bereiter-Hahn et al. eds., 1986); P.F. MILLINGTON & R. WILKINSON, SKIN, 158-65 (1983); WILLIAM MONTAGNA ET AL., BLACK SKIN, STRUCTURE AND FUNCTION 10-12, 97-98 (1993). There are, however, some who question this connection. *See, e.g.*, H.F. Blum, *Does the Melanin Pigment of Human Skin Have Adaptive Value?*, 36 Q. REV. BIO. 50 (1961); MONTAGNA ET AL., *supra*, at 12, 135-36.

> local adaptations to climate and other specific environmental conditions. The group concluded: "Categorization of humans by distribution of genetically determined factors is artificial and encourages the production of unending lists of arbitrary and misleading social perceptions and images."[75]

Likewise, rejection of race as having a place in biology is supported by the most comprehensive inventory of human genetics undertaken to date, directed by Stanford University's L.L. Cavalli-Sforza. He concludes:

> The classification into races has proved to be a futile exercise for reasons that were already clear to Darwin. . . . Although there is no doubt that there is only one human species, there are clearly no objective reasons for stopping at any particular level of taxonomic splitting. . . . Statistically, genetic variation within clusters is large compared with that between clusters. All populations or population clusters overlap when single genes are considered, and in almost all populations, all alleles are present but in different frequencies. No single gene is therefore sufficient for classifying human populations into systematic categories.[76]

Rather, race is a social phenomenon, built around socially-selected prejudice tags and used for social subjugation and exploitation. As the Cavalli-Sforza study continues:

> The word "race" is coupled in many parts of the world and strata of society with considerable prejudice, misunderstanding, and social problems. Xenophobia, political convenience, and a variety of motives totally unconnected with science are the basis of racism, the belief that some races are biologically superior to the others and that they have therefore an inherent right to dominate. Racism has existed from time immemorial but only in the nineteenth century were there attempts to justify it on the basis of scientific arguments. Among these, Social Darwinism, mostly the brainchild of Herbert Spencer (1820-1903), was an unsuccessful attempt to justify unchecked social competition, class stratification, and even Anglo-Saxon imperialism. Not surprisingly, racism is often coupled with caste prejudice and has been invoked as motivation for condoning slavery, or even genocide. There is no scientific basis to the belief of genetically determined "superiority" of one population over

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75. Lionel Tiger, *Trump the Race Card*, WALL ST. J., Feb. 23, 1996, at A12.

76. L. LUCA CAVALLI-SFORZA ET AL., THE HISTORY AND GEOGRAPHY OF HUMAN GENES 19 (1994) (citations omitted).

> another. None of the genes that we consider has any accepted connection with behavioral traits, the genetic determination of which is extremely difficult to study and presently based on soft evidence. The claims of a genetic basis for a general superiority of one population over another are not supported by any of our findings. Superiority is a political and socioeconomic concept, tied to events of recent political, military, and economic history and to cultural traditions of countries or groups. This superiority is rapidly transient, as history shows, whereas the average genotype does not change rapidly. But racial prejudiced has an old tradition of its own and is not easy to eradicate.[77]

The law has arrived at a similar conclusion. Race is a deeply pernicious social construct in America, aimed with particular potency, although by no means exclusively, at African-Americans, and built around literally skin-deep differences. In considering racially constructed legal measures, particularly those bringing some detriment to traditionally disadvantaged groups, modern courts have developed the 'strict scrutiny' test: "Classifying persons according to their race is more likely to reflect racial prejudice than legitimate public concerns. . . . Such classifications are subject to the most exacting scrutiny."[78] We know enough about human motivation in the United States to understand that racism, and not policy, is likely to be at the heart of such laws. Against this background, it is fair to conclude that "scientific explanations" stigmatizing persons according to their race or ethnicity are also much more likely to reflect racial prejudice than legitimate scientific activity. We should view any such claims—whether explicit or implicit—with the utmost suspicion.

VII. THE CONUNDRUM OF GENDER

Gender is a more difficult topic, in the sense that it is harder to be so categorical about it. On the one hand, there is a history of subjugation and stigmatization that is just as clear-cut, if not necessarily as horrific, as our slavery of African-Americans and genocidal dispossession of Native Americans. This history was at one time reflected in the law. It was a nineteenth century U.S. Supreme Court Justice who wrote:

> Man is, or should be, woman's protector and defender. The natural and proper timidity and delicacy which belongs to the female sex evidently unfits it for many of the occupations of civil life. The

77. *Id.* at 19-20.

78. Palmore v. Sidoti, 466 U.S. 429, 432 (1984).

> constitution of the family organization, which is founded in the divine ordinance, as well as in the nature of things, indicates the domestic sphere as that which properly belongs to the domain and functions of womanhood.[79]

As with race, we have somewhat belatedly come to recognize the extent of the harm done by these approaches: "There can be no doubt that our Nation has had a long and unfortunate history of sex discrimination. Traditionally, such discrimination was rationalized by an attitude of 'romantic paternalism' which, in practical effect, put women, not on a pedestal, but in a cage."[80]

Nonetheless, the law has not gone as far in throwing out gender based classifications as it has with race. They need considerably higher than normal justification, but are not inherently suspect. As Justice Ginsberg recently wrote:

> Parties who seek to defend gender based government action must demonstrate an "exceedingly persuasive justification" for that action. . . . The heightened review standard our precedent establishes does not make sex a proscribed classification. Supposed "inherent differences" are no longer accepted as a ground for race or national origin classifications. . . . Physical differences between men and women, however, are enduring. . . . "Inherent differences" between men and women, we have come to appreciate, remain cause for celebration, but not for denigration of the members of either sex or for artificial constraints on an individual's opportunity. . . . [S]uch classifications may not be used, as they once were, . . . to create or perpetuate the legal, social, and economic inferiority of women.[81]

While there are social scientists who maintain that gender is essentially a social construct, differences in sex and gender are at least rooted in biology. This is, after all, a circumstance where there *is* a gene for it—i.e., the Y chromosome. There are (at least most of the time) clear physical differences between the genders; there are ongoing differences in hormonal climate (at least some of the time); and there is even some evidence for difference (on average) in some structural areas of the brain, in some test results for cognitive functions (although the testing difference could in most cases demonstrate

79. Bradwell v. State, 83 U.S. (16 Wall.) 130, 141 (1872) (Bradley, J., concurring).
80. Frontiero v. Richardson, 411 U.S. 677, 684 (1973) (Brennan, J., concurring).
81. United States v. Virginia, 116 S. Ct. 2264, 2274-76 (1996) (citations omitted).

culturally and experientially generated difference), and in some behaviors.[82] Gillian Einstein has written:

> "Vive la difference." "Isn't that just like a (wo)man?" "It's on the Y chromosome." These are all expressions used to denote pleasure (or displeasure) with the behavioral differences associated with the sexes. While some of these distinctions may be rooted in societal expectations or individual biases, they also arise because the brains of females and males are in some respects different. These differences in central nervous system structure are called sexual dimorphisms. . . . The functional consequences of sexual dimorphisms is less clear; nonetheless, they provide an increasingly plausible basis for a variety of behaviors that are different in the two sexes.[83]

Sorting through the sources of gender difference, however, is hard. Societal factors also clearly play a big role:

> More often than not, external conditions appear to reinforce a possible tilt toward the subordination of women that may be embedded in certain features of our sexual dimorphism. Harsh physical and social environments, for example, have been shown by Sanday and others to foster the emergence of societies that are sex-stratified and authoritarian, just as, in the literature of personality development, certain kinds of harsh psychological environments provide the milieu for the development of authoritarian personalities in individuals.[84]

Other authors have commented that "the standards of validity for scientific research should be higher when the results appear to reinforce folk assumptions than when they contradict popular wisdom."[85]

So, what is one to do about mixing biology into a discussion of gender? The dangers for reinforcing stereotypes are present. Some contemporary

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82. *See, e.g.*, Doreen Kimura, *Sex Differences in the Brain*, *in* MIND AND BRAIN: READINGS FROM SCIENTIFIC AMERICAN 78 (1993); Gillian Einstein, *Sex, Sexuality and the Brain*, *in* NEUROSCIENCE 529 (Parnes et al. eds., 1997). *See generally* DEBORAH BLUM, SEX ON THE BRAIN: THE BIOLOGICAL DIFFERENCES BETWEEN MEN AND WOMEN (1997); RICHARD WRANGHAM & DALE PETERSON, DEMONIC MALES: APES AND THE ORIGINS OF HUMAN VIOLENCE (1996).

83. Einstein, *supra* note 82, at 529.

84. Ruth Gallagher Goodenough, *Situational Stress and Sexist Behavior Among Young Children*, *in* BEYOND THE SECOND SEX, NEW DIRECTIONS IN THE ANTHROPOLOGY OF GENDER 227 (Peggy Reeves Sanday & Ruth Gallagher Goodenough eds., 1990) (citations omitted).

85. Tom Boellstrorff & Lawrence Cohen, *Queer Science Indeed*, SCI. AM., Oct. 1997, at 146 (1990) (quoting Jonathan Marks, a biological anthropologist at Yale University).

scholars seem prone to dwell on the differences, in the process giving ammunition to those who would perpetuate *per se* barriers to women's entry into areas of society from which they have been barred in the past.[86] Men can also be caricatured to their detriment. Thus, in the study of violence and crime it is *men* who look most at risk for group vilification. There is certainly a highly significant link between crime and gender. Across all groups in America, crime is largely committed by males. Books such as the recent *Demonic Males: Apes and the Origins of Human Violence*, teeter on the brink of stigmatizing men.[87] Nonetheless, there is too much evidence that biology plays a part in gender difference to dismiss it out of hand. We should be intellectually mature enough to recognize that with respect to gender biology is not itself destiny, but that on some gender issues biology may be one of the multiple elements from which destiny is built. Once again, the law seems to have it right: we should cautiously explore the scope of the enduring gender differences, while taking care to avoid denigration and artificial constraints on both women and men.

VIII. THE RESPONSIBLE USE OF BIOLOGY IN LEGAL SCHOLARSHIP: A SUGGESTED PROGRAM

This Essay has focused on two basic questions: (1) whether a biologically informed view of human behavior can add to our understanding of the law; and (2) whether biology can be appropriately used in legal scholarship, and particularly in scholarship relating to crime. The debate over bringing biology to bear on human behavior is moving, with relatively few hold-outs, from "is it possible" to "how can it best be done." That leads to the second question: are there guidelines, a program if you will, that can help ensure a responsible result? Some of the concerns about bringing biological insights to bear on human behavior and the law are indeed serious. I have argued, however, that these are by no means insurmountable. The goal of surmounting them was at the core of the planning for the April 1997 symposium. Both in the doing and in the reflecting, I have come to my own conclusions, which boil down to four basic, largely common-sense, guidelines: (1) keep the possibility of abuse clearly in mind; (2) avoid reflexive accusations of abuse; (3) keep good science closely involved in the investigation; and (4) keep the forum open to a wide variety of views. While their straightforwardness may do little to

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86. *See, e.g.*, Kingsley R. Browne, *Sex and Temperament in Modern Society: A Darwinian View of the Glass Ceiling and the Gender Gap*, 37 ARIZ. L. REV. 971 (1995). For a cogent caution on contemporary abuse see Horsburgh, *supra* note 55.

87. WRANGHAM & PETERSON, *supra* note 82. A fictional stigmatization of men based in evolutionary biology appears with some humor in LAURA ZIGMAN, ANIMAL HUSBANDRY (1998).

credit my originality of thought, it suggests that the problem is not so intractable after all.

The predicate for any of these considerations is, of course, the changing and rewarding process of scholarship itself. Opening up portions of the black-box and bringing the knowledge to bear on problems of law and society remain the over-arching goals for the participants in this work. This is where, quite properly, they want to spend the bulk of their time. Nonetheless, there are good reasons for intentionality on the issues of responsible use. Some of my suggestions are aimed at practitioners of biologically informed jurisprudence; some at its critics; and some at those on the sidelines. Taken together, they provide a down-to-earth framework for getting on with the task.

A. A Suggested Program for Combining Biology, Behavior, and Law

Kenneth Grahame described a version of the basic problem in his children's story, *The Reluctant Dragon*.[88] In this fable, a dragon appears in a cave on the edge of a village. Notwithstanding the fact that he is preoccupied by poetry and has not the least desire to ravage the neighborhood, the villagers call for his demise. The inhabitants of the nearby village are up in arms:

> The dreadful beast must be exterminated, the country-side must be freed from this pest, this terror, this destroying scourge. The fact that not even a henroost was the worse for the dragon's arrival wasn't allowed to have anything to do with it. He was a dragon, and he couldn't deny it, and if he didn't choose to behave as such that was his own lookout.[89]

Distinguishing between dangerous dragons and well-meaning ones can be difficult, especially in a world where knowledge of all kinds can be used for good or for ill.

1. Keep the Possibility of Abuse Clearly in Mind: Avoid Being a Dangerous Dragon

Some dragons are dangerous. Although such abuse is rare in contemporary scholarship, biology still sometimes masks racist, sexist, and other oppressive arguments. Individuals working on human biology have a special responsibility to be sure that their efforts are as free of bias as possible,

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88. KENNETH GRAHAME, *The Reluctant Dragon*, *in* DREAM DAYS 106 (1902).
89. *Id.* at 121.

thus avoiding mischaracterization by the social darwinist fringe on the one hand and by die-hard critics of biology on the other. As a concrete affirmative step, naming and actively recalling the problem helps to prevent its recurrence.

2. Avoid Reflexive Accusations of Abuse: Do Not Create Dangerous Dragons That Are Not There

Just as those who do this kind of work must take extra care, those who guard the village should make sure that the dragon is in fact dangerous before charging to attack. In the story, St. George arrives to slay the dragon, and at first simply can't believe that he is not dangerous. The Saint tells the boy who has befriended the dragon: "And yet—may not this wily beast have misled you as to his real character, in order that your good report of him may serve as a cloak for his evil deeds? Nay, may there not be, at this very moment, some hapless Princess immured within yonder gloomy cavern?"[90]

A firm rejection of racism, sexism, and other potential abuses must aim at real targets.[91] These problems are hard enough to address and resolve without creating taboos against their discussion. If there is to be progress, there must be room for people of good will to grope toward better understandings in these fraught areas. Guilt by unjustified characterization is all too possible a fallacy, and one that has been used against biologically informed thinking with some regularity. In such cases protestations of innocence are met with either scoffing incredulity or the intrinsically unanswerable "you just don't get it." While on the alert against dangerous dragons, we must take care not to vilify reluctant ones. The trick, of course, is in distinguishing the two. Both kinds assert their innocence. A careful examination of what the particular dragon in fact says and does, as opposed to third party characterizations, is our best hope for choosing wisely.

3. Keep Good Science Closely Involved: It Exposes Dangerous Dragons

The best chance for achieving useful results in any combination of law and another scholarly discipline is staying close to the other discipline and its most skilled practitioners. Here, that means immersion in the science itself, including an understanding of the limits of biology as well as of its power. A corollary is that the best antidote for misused science is *more and better* science, not less and worse. Good science exposes dangerous dragons.

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90. *Id.* at 127.

91. *See, e.g.*, RANDALL KENNEDY, RACE, CRIME AND THE LAW 7-9 (1997).

Keeping scientists in the discussions is therefore key.[92] Keeping the scientists in the loop is not always easy. There are deep differences, both in style and substance, between the scholarly traditions of science and law. Furthermore, to the extent that guideline number two is failing to hold, there may be difficulties involving people whose basic work can be put in jeopardy by what is, in effect, a frolic and diversion into the debates of a different discipline. Few scientists like being called dangerous dragons—it scares them away.

4. Keep the Forum Open to a Variety of Views: St. George and the Dragon Need to Talk

By the end of the fable, St. George and the dragon are able to come to an understanding. How? They get together and talk to each other.[93] In the story, this takes some doing. In academia, it should be easier to bring about. After all, the open engagement in scholarly debate, with room made for criticism and review, is at the heart of the academic method. While the whole academic enterprise can be attacked, this openness, and the conventions of civility that support it, cannot be taken from its core without essentially compromising the undertaking. On the other hand, specific scholarly endeavors can take positions and leave others unrepresented. For instance, the usefulness of the April symposium was not significantly undercut by the failure to include either a biblically-inspired creationist or a classic eugenicist. Still, on an issue such as this, it is important to hear both from partisans and from nay-sayers. In providing a measure of perspective, the role of the invited skeptic is an honorable and often essential one, and the insights gained will be poorer if there are not contrary voices keeping all sides honest.

B. The Gruter Institute and Other Scholarly Resources

The Gruter Institute for Law and Behavioral Research, the co-sponsor of the symposium around which the essays in this volume have taken shape, has had a particular importance in stimulating an examination of the role of biology in human behavior and of possible applications of an understanding of this role to the study of law.[94] I myself have had a connection with the

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92. *See, e.g.*, Christopher Badcock, *Reciprocity and the Law*, 22 VT. L. REV. 295 (1997).

93. *See* GRAHAME, *supra* note 88, at 128-33.

94. The Gruter Institute and its tireless president, Margaret Gruter, have organized numerous conferences, publications, and research projects dedicated to the idea that a biologically informed understanding of human behavior will advance an understanding of what law does and what it can do. Further information on the Gruter Institute and its activities may be found at its website, <http://www.Gruterinstitute.org>.

Gruter Institute over some years.[95] Its sponsorship of the April symposium was in large part at my suggestion. While committed to the desirability of considering biological influences on human behavior, it has consistently included the diversity of viewpoints called for above, and has just as consistently opposed any return to eugenics or the other misuses of this approach.[96] I have drawn inspiration for my own commitment to avoiding simplistic, deterministic answers and to pursuing responsible scholarship in this area from the examples which I have seen in previous Gruter Institute programs.[97]

Along with the Gruter Institute's activities, other institutional and individual initiatives are making reputable and scrupulous combinations of biology, behavior, and law. Within the past year alone, an issue of the *Journal of Contemporary Legal Issues* has come out devoted to law, human behavior, and evolution.[98] In the last year, two legal scholars not represented in this volume, Owen Jones of Arizona State and Donald Elliot of Yale have published important articles which survey much of the scholarship to date and suggest road maps for future work. Jones's *Evolutionary Analysis in Law: an Introduction and Application to Child Abuse* not only advances a systematic model for incorporating biology into law, it also contains comprehensive

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95. I have been a Gruter Institute Research Fellow since 1995, and in the summer of 1997, I joined its executive committee.

96. *See, e.g.*, Margaret Gruter & Roger D. Masters, *Ostracism as a Social and Biological Phenomenon, an Introduction*, *in* OSTRACISM: A SOCIAL AND BIOLOGICAL PHENOMENON 3 (M. Gruter & R. Masters eds., 1986)

> We do not, of course, intend to justify racism, genocide, or oppression . . . . No one should conclude that human murders—and still less, wars—are either inevitable or desirable merely because a few cases of intraspecific killing among nonhuman primates have been observed . . . . In the modern nation-state, where the mass media and propaganda magnify the effects of stereotypes and provide powerful means for manipulating public opinion, the danger that social rejection can easily become a tool of oppression is all too real.

Id.

97. For example:

> To look at the law as it affects human behavior in the light of the life sciences does not imply the intention of finding a universally valid "natural law," akin to theological or ideological doctrine. On the contrary, we find that humans can form radically different social systems due to the plasticity of their behavior. However, an interdisciplinary analysis of ostracism as a common area of behavior, combining biology, law, and the social sciences can produce insights that none of these fields alone can provide.

Id. at 1. For my own work on integrating biological and cultural consideration into a more nuanced synthesis, see, for example, Oliver R. Goodenough & Richard Dawkins, *The "St. Jude" Mind Virus*, NATURE, Sept. 1, 1994, at 23-24, and Oliver R. Goodenough: *Mind Viruses: Culture, Evolution, and the Puzzle of Altruism*, 34 SOC. SCI. INFO. 287, 287-320 (1995).

98. *See* 8 J. CONTEMP. LEGAL ISSUES (Spring 1997).

bibliographic references.[99] Elliott's *Law and Biology: The New Synthesis?*, contains perceptive reflections on developments to date on these issues by an academic and practitioner who has been a major contributor to the debates.[100] We should, of course, demand responsible scholarship, but we should not fear it.

CONCLUSION

The goal of the symposium has been to make the law/biology connection in a rigorous, responsible way in the context of criminal law. This Essay has explored the background for doing this, as well as some of the legitimate cautions which need to be exercised and some of the misconceptions which sometimes lead to overblown cautions. Sadly, there is still need for care in avoiding the snares which lie in wait. But law/biology scholarship is not alone in having snares. Indeed, they are so well identified, and the appropriate cautions widely enough shared, that this may, ironically, be a relatively *safe* theory to practice. More concretely, I have proposed guidelines for undertaking this interdisciplinary inquiry. Whether these guidelines achieve their goals is up to the reader to decide

Let me end as I began, by returning to the notice which society, through scholarly books and the popular press, is taking of biological insights into human behavior. The reviews of two recent books sum up the goals of this issue and its companion symposium.[101] They suggest the inevitability of the encounter of law and biology, the need for caution, and the need to go forward.

In his November, 1997 *New Yorker* review of Steven Pinker's *How the Mind Works*, Oliver Morton writes:

> To allow that our genes may shape our minds is not to say that the genes control us; biology, *pace* Freud, is not destiny. . . . While some of our instinctive programming is difficult to ignore, emotions do not, in fact, override all else. We have choices. We can choose to be unnatural. We often do. And it is often the right choice, practically and morally.
>
> Much of the opposition to evolutionary psychology comes from people who would rather not believe that its findings are true, and who fear the consequences if various human proclivities are

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99. Jones, *supra* note 48, at 1117.

100. Elliott, *supra* note 48, at 595.

101. The two books reviewed were Steven Pinker's HOW THE MIND WORKS and Deborah Blum's SEX ON THE BRAIN: THE BIOLOGICAL DIFFERENCES BETWEEN MEN AND WOMEN. *See infra* notes 102-104 and accompanying text.

> given the imprimatur of science. They are unconvinced by the protestation that evolutionary psychology is about what is rather than what ought to be, and they are probably right to be unconvinced. The very fact that the confusion of "is" and "ought" has a name—the naturalistic fallacy—shows that the confusion is, and likely to remain, widespread; it, too, may be part of human nature. And so evolutionary psychology, some misappropriated and some just bogus, will undoubtedly be wielded by demagogues.
>
> Which is all the more reason for pursuing good research in the field, instead of trying to blacken its name indiscriminately, as some critics have done. . . .[102]

His conclusion mirrors that of the conference organizers'—that a biologically-informed human behavior should help us improve our societal institutions:

> If biology can provide some of the answers, the way ahead lies clear for reinvigorated social science to provide the rest, as long as the two can find a way to work together. Armed with more reliable ideas about human nature, we might yet manage to improve our artificial societies in deeply unnatural ways, provided we remain mindful of what evolution has wrought but are not bound by it. Having a manual helps, but in the end the only person who can decide what is a bug and what is a feature is the user.[103]

Writer Ann Finkbeiner concluded, in her somewhat skeptical, and yet encouraging review of *Sex on the Brain*, a recent book on biology and gender:

> [O]ne answer is emerging, and it is also the book's message: that the causes of behavior are both biological and cultural and are intricately interwoven. We needn't choose which is more important. In songbirds, usually only males sing. The group of neurons in the males brains that controls singing is six times as large as in females' brains; when scientists block testosterone in male baby songbirds, they never sing. But they also never sing if, at a precise time in their childhood, they don't hear their relatives singing. So the cause of singing is this: A male baby hears a song, which starts a process that uses testosterone to build his brain in such a way that he sings. Something about that intricacy sounds exactly right, doesn't it?[104]

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102. Oliver Morton, *Doing What Comes Naturally*, NEW YORKER, Nov. 3, 1997, at 106-07.
103. *Id.* at 107.
104. Ann Finkbeiner, *How to Tell Men From Women*, N. Y. TIMES BOOK REV., Aug. 24, 1997, at

There are similarly intricate, multi-factoral explanations for some of the problems of human criminality. It is time to go looking for them.

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14 (reviewing DEBORAH BLUM, SEX ON THE BRAIN: THE BIOLOGICAL DIFFERENCES BETWEEN MEN AND WOMEN, (1997)).