
They Blinded Me with Science: Misuse and Misunderstanding of Biological Theory

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In 2000, MIT Press published a book by Randy Thornhill and Craig T. Palmer entitled *A Natural History of Rape: Biological Bases of Sexual Coercion*.¹ One consequence of this is that I spent \$35 to purchase the book and several months reading and thinking about it to produce this chapter. The experience has not been unlike what Samuel Johnson must have felt in responding to Bishop Berkeley's theory of the nonexistence of matter. Exposing Thornhill and Palmer's theoretical holes and lapses of logic is no more difficult than giving a swift kick to a large stone. But it's just about as painful, too—painful to read for anyone accustomed to thinking logically, painful to see work like this embraced and promoted by the media as scientific fact, and painful to contemplate the low level of scientific literacy that must therefore obtain.

Thornhill is described on the book jacket as a Regents' professor and professor of biology at the University of New Mexico; Palmer, as instructor of anthropology at the University of Colorado. Thornhill and Palmer declare that rape is about sex and sexual reproduction, not violence. Their theory is based on evolutionary psychology (formerly known as sociobiology) and asserts that rape is an adaptive behavior that promotes reproductive success for males. Further, Thornhill and Palmer claim that proposals for eliminating rape that do not take evolution into account are doomed to failure.

In evolutionary theory, an *adaptation* is a trait directly selected for, because the trait's function tends to promote the differential survival of those who possess it over those who do not. *Differential survival* means that an individual with the trait survives and produces more offspring with the trait, who in turn survive and produce more offspring, and so

forth. Adaptations arose as solutions to past environmental problems. Thornhill and Palmer tell us that rape is an adaptive solution to a particular problem males face—"the difficulty of gaining sexual access to choosy females."²

Combining a selective attention to evidence with a misunderstanding of the limits of scientific certainty and explanatory power, the authors remake biological theory to promote a limited, scientifically untenable, and socially conservative view of human nature and sexual behavior. "Scientific" arguments are presented as irrefutable and final and may easily be interpreted as such by a naïve audience and/or used to lend the aura of scientific truth to political claims of all sorts. An example of this is Daphne Patai's essay on *Natural History*, in which she uses Thornhill and Palmer's arguments to attack feminism in general.³ Despite her self-proclaimed lack of scientific credentials, and her acknowledgment of scientific critiques of *Natural History*, she finds Thornhill and Palmer compelling—or useful—enough to help advance her antifeminist political aims.

For both in the writing and in the marketing of *Natural History*, the authors are explicitly critical of feminists and feminism. According to Thornhill and Palmer, feminists insist on a monolithic account of rape as a violent act that has nothing to do with sex. This, along with feminists' inability to embrace evolutionary theory, prevents feminists from producing accurate accounts of why men rape and so from arriving at useful solutions. This claim itself misrepresents feminist perspectives on rape. As Natalie Angier notes, "Most of us have long known that rape is about sex and power and a thousand other things as well, and that rape is not a monolithic constant but varies in incidence and meaning from culture to culture and epoch to epoch." Angier also rightly notes that it is feminists who "sought to have the word 'rape' replaced in the legal lexicon by the terms 'sex crime' and 'sexual battery,' the better to include offenses that don't involve intercourse but are clearly sexual in nature, such as . . . forced fellatio, anal penetration, the shoving of a gun barrel up the vagina, and the like."⁴ Rape clearly is not limited to a single type of behavior or pattern of behavior that is found in every case. Feminists have always been attentive to this reality and to the fact that in the real world of sexual offenses it is difficult to ignore the ways in which sex *and* violence are often fused.

Thornhill himself asserts that the conclusions in *A Natural History of Rape* "are not debatable issues" and has accused his critics of being anti-science and of presenting misleading views about the nature of science.⁵ And, in their preface, Thornhill and Palmer invoke Karl Popper's theory of scientific progression through the falsification of ideas mainly to outline the ways in which they may not be critiqued.⁶ Any critique that re-

lies on any theory other than evolutionary psychology is deemed by Thornhill and Palmer to be *a priori* invalid. Declaring issues nondebatable and placing one's theory beyond critique does not match with any definition of science I ever learned in the classroom or the laboratory. Other critics have pointed out that Thornhill and Palmer make assertions that cannot be tested, and that by presenting a totalizing theory that purports to explain everything, they rule out nothing, undermining their own claims of scientific authority and betraying their ideological bias.⁷

Nevertheless, I shall take Thornhill and Palmer at their word that what they present is a scientific study, and I offer in this essay a scientist's critique of their theory and methods. I explicitly position myself in this endeavor as a scientist who self-identifies as a feminist. This is important because Thornhill and Palmer, as well as their supporters, portray feminists as antiscience and as unwilling or incapable of embracing science and its methods.

Rather than revisit scientific critiques made so well elsewhere, I shall focus, as Thornhill and Palmer insist would-be critics must, on "the very heart of the perceived difficulty with [their] idea"; that is, with their foundational assumptions.⁸ I shall also discuss the significance of their rhetorical move to align feminism and all social science with ignorance, emotion, and antiscientific beliefs, while aligning themselves and evolutionary psychology with logic, reason, and scientific truth. I begin with a brief summary of the propositions that underlie their theory.

SEEKING THE CAUSE OF THINGS THAT WEIGH TEN POUNDS

A variety of scientists (both biological and social), who may or may not identify as feminists, have offered reasoned critiques of *Natural History*.⁹ These critics have pointed out flaws such as lack of empirical evidence, overreliance on pop literature surveys versus scientific literature, inattention to cross-cultural patterns of rape and an assumption that U.S. patterns are universal, and misinterpretation of data, including misrepresenting data that appeared in a paper authored by Thornhill and his wife.¹⁰ Furthermore, Matt Cartmill persuasively contends:

It's a mistake to argue about the causes of rape. . . .We define [rape, murder, and war] by their properties and their effects, not their causes, and there's no reason to think that acts that share an effect also share a cause. . . . [A]ll homicides share the same effect . . . but they don't all have the same cause. . . . Seeking the cause of murder, war, or rape may be a fundamental mistake, like asking for the cause of things that weigh 10 pounds.¹¹

Thornhill and Palmer make critical errors in their assumptions that what has happened (evolution) is the key to knowing what will happen (development), that a single unified theory of causation for rape exists, and that such a theory will explain how to prevent rape.

Thornhill and Palmer's evolutionary psychological explanation of the cause of rape, and their claim of its superiority as an explanatory tool, rests on two propositions. First, while research and theory in the social sciences is ideologically shaped and driven, evolutionary psychology is a true science, free of ideology and based on facts. Second, all human behavior has two levels of causation: proximate and ultimate. Proximate causes of behavior operate over the short term, and most social scientists are exclusively concerned with proximate causes. Ultimate causes underlie all proximate causes. Proximate causes explain how developmental or physiological mechanisms cause something to happen, but ultimate causes explain why particular proximate mechanisms exist. For example, Thornhill and Palmer note that the proximate cause of vision is the structure of rods and cones in the eye, but the ultimate cause of the rods and cones is evolutionary adaptation that favored development of rods and cones. It is important to know ultimate causes because some possible proximate explanations may be incompatible with ultimate causes. Evolutionary psychologists are concerned with the ultimate causes of human behavior, and evolutionary theory, with its explanation of how natural selection leads to adaptations, is the only source of information about them. In order to develop effective solutions to problems like rape, we must have knowledge of ultimate causes. Otherwise, the solutions we propose may not only be ineffective, but may actually exacerbate the situation.

Two additional concepts are important for Thornhill and Palmer's theory—the notion of “evolved differences between male and female sexuality”¹² and the idea that the “cultural behavior of individuals is *never* independent of the human evolutionary history of selection for individual reproductive success.”¹³ So, in their view, the behaviors around sex, including rape, are the result of evolutionary adaptations that promoted the differential survival of offspring.

The cornerstone of Thornhill and Palmer's theoretical edifice is this truism: “No aspect of life can be completely understood until both its proximate and its ultimate causes are fully known.”¹⁴ Proximate causes exist and are complements, not alternatives, to the ultimate cause of millions of years of natural selection. So far, so good—there's nothing here that even a feminist social scientist could argue with. Thornhill and Palmer go on to argue that the best and most useful solutions to social

and biological problems can only arise from awareness of ultimate (evolutionary) causes of behavior. Ultimate explanations will “lead to the best insights about proximate causes, and identifying proximate causes is the key to changing human behavior.”¹⁵ Without knowing ultimate causes, one can be misled about proximate causes, and therefore workable solutions will be unattainable. Thornhill and Palmer believe that science explains why things are and that this knowledge is what allows us to develop useful solutions and innovations. But solutions and innovations are, for the most part, developed by engineers, and often an innovation predates our scientific understanding of why it works. Science can give us an explanation of why something works but that is not the same thing as giving us a solution or a practical application, as I shall now show.

ULTIMATE CAUSES AND EFFECTIVE SOLUTIONS

Let us examine the proposition that knowledge of ultimate causes is necessary for development of effective solutions. As a first test of this proposition, consider Thornhill and Palmer’s own example of vision. The science of optics, and the development of spectacles for the improvement of vision, did not require an understanding of the evolutionary adaptations that promoted the development of the system of rods and cones found in the human eye. Both spectacles and the science of optics predated Darwin and the development of evolutionary theory. Furthermore, it is not just the rods and cones, or the evolutionary history which produced them, that are responsible for vision. The nature and properties of light are also necessary for vision to exist. In the absence of light, there is no vision, no matter how evolved your rods and cones may be. Knowing the evolutionary origins of a behavior, or even of a physical trait, is in many cases not sufficient or even necessary to arriving at a solution for a problem or an improvement for an existing situation. Humans *always* exist and operate within a context that is shaped by their current physical and intellectual environment. Human evolutionary history sets parameters for what is possible, but those parameters are wide and far-reaching. I saw this every day in my research on human cancer cell lines. All the cells in a particular line shared a common genetic makeup, yet minimal changes in environmental conditions (the amount of glucose or other common nutrients they were fed) were sufficient to evoke widely different outcomes of cell function, morphology (shape), and growth patterns.¹⁶

A corollary proposition is that effective solutions indeed follow from perfect knowledge of ultimate causes. But perfect knowledge of the

evolutionary causes of human behavior does not necessarily guarantee that the knowledge will be useful for crafting any kind of practical solution to issues of concern. One could also argue that evolution itself has an ultimate cause, that is, the Big Bang, which could be given as the ultimate cause of everything. Yet, it is hard to see how knowledge of Big Bang theory would be either useful or necessary to crafting an effective solution to rape, or even how Big Bang theory as an ultimate cause would be useful for developing and understanding evolutionary theory. Certainly, one hesitates to suggest that no theory of evolution can be considered valid unless it takes the Big Bang into account.

Ultimate causality could, in fact, be interesting without being useful (as in the case of vision and eyeglasses). For example, some scientists say that the laws of quantum mechanics ultimately govern the behavior of all material. Suppose I want to design a plastic bottle cap that can withstand temperature extremes from -50 degrees to 120 degrees Fahrenheit. I also want the bottle cap to be recyclable. I do not need to understand the quantum mechanical underpinnings of the behavior and characteristics of plastics to be able to design and produce my cap, which is a good thing, since no one has that knowledge. Yet, such bottle caps are designed and produced. If I did have perfect knowledge of the quantum mechanical behavior of plastics, it would not change the fact that I had already designed an effective bottle cap that met my design criteria.

The universal claim that evolution, not culture, is the ultimate cause of all human behavior, and that culture itself is behavior ultimately caused by evolution, leads Thornhill and Palmer into the trap of a theory that explains everything, and therefore nothing.¹⁷ Taken to its extreme, their theory makes it impossible to determine what, if anything, is true. For example, they state repeatedly that social science has proposed solutions to rape that are doomed to failure because they are political and not based in evolutionary theory. But if all human behavior is ultimately caused by evolution, then we may say that the proposing of solutions, a human behavior, is caused by evolution. A priori, what is the difference between the solutions proposed by feminists and the solutions proposed by Thornhill and Palmer, if both are the result of evolution? Thornhill and Palmer will insist that a difference does exist (so would I) but how one chooses between the two cannot be explained by evoking the evolution-as-ultimate-cause theory, since that could be applied to any theory proposed and is therefore not a criterion that can be used to choose between competing theories.

WHAT'S WRONG WITH THIS SOLUTION?

If Thornhill and Palmer are correct that evolutionary theory is necessary to understand and eliminate rape, and that their particular theory provides the correct evolutionary perspective, we might expect some startling new recommendations. The antirape program they outline is as follows: educate young men about how their evolved sexual desires may lead them to want to commit rape, but tell them they should resist doing so. Tell them about the penalties for rape. Educate young women about the Darwinist history that leads men to be rapists. Make them aware “of the costs associated with attractiveness.”¹⁸ Dressing sexy may help attract desirable males, but it will also attract undesirable ones. Women should not be encouraged “to place themselves in dangerous situations” just because men don’t have the right to rape.¹⁹ In the absence of official structural barriers restricting the access of men to women, women should interact with men only in public places in the early stages of relationships, and carefully consider in what conditions they will consent to be alone with men. In other words, men should try to be good, and women should restrict their mobility, dress modestly, and endeavor to be chaperoned. Rape’s ultimate explanation identifies rape’s proximate causes as women and their behavior.

If this sounds familiar, you may be thinking of white upper-class norms of Victorian culture, or the Taliban, or the rules for student behavior at Liberty College. Social conservatives in the United States and religious fundamentalists of many descriptions arrive at strikingly similar conclusions about the necessity for women to limit their activities, dress, movements, and sexual practices without recourse to indisputable “scientific” explanations. It is hard to see why an evolutionary approach was necessary to arrive at these solutions, since all of them have been proposed before and even carried out in other times and places. These so-called solutions place a burden on women to prevent the misbehavior of men, stopping just short of blaming the victim.

The unspoken assumption within Thornhill and Palmer’s theory and proposals is that, given the opportunity, all men would choose to commit rape, unless they have been educated to struggle against their Darwinian inheritance. If this theory is correct, does it follow that their proposals are inevitably and uniquely correct? In a word, no. There are many possible behavioral and policy suggestions for eliminating rape that are consistent with their theory. For example, one could propose that all men should be locked up twenty-four hours a day and be let out only under the guard of

heavily armed women who would escort them to places where they would perform useful work. Men would never be allowed to have intercourse with women, but would be periodically harvested for sperm as needed to continue propagating the species. This would effectively eliminate rape.

Whether Thornhill and Palmer are right or wrong about evolution's explanatory value for rape, it is certainly possible that their recommendations could contribute to reducing the incidence of male–female rape, just as my modest proposal for locking up all men would reduce the incidence of male–female rape (though perhaps it would have the opposite effect on the incidence of male–male rape). Whether or not either course of action is found to be a socially acceptable solution—and who might find it acceptable or not—is another question, and one that cannot be answered by science.

MEN WANT SEX, WOMEN WANT MATES—NATURALLY!

A central tenet of the evolutionary view of human sexuality espoused by Thornhill and Palmer is the assumption that only women care about mate choice. Women are evolutionarily designed to resist rape and to suffer psychological pain after rape, because rape thwarts their mate choice. Men are evolutionarily designed for rape, because it lets them spread their seed far and wide. But why is it rational to assume that men would have no care about where their seed gets spread? If women want to mate with the best males, why don't men want to mate with the best females? Why will any old—or young—female do? Why aren't men choosy about their mates? This gender-unbalanced theory disregards male mate preference as a possible evolutionary influence and limits mate choice/preference solely to women—which implies one of two preexisting biases.

Bias 1: Men contribute everything to the child; the woman is only an incubator. Therefore, any woman will do and men need not be choosy. Women must be choosy, in order to get the best male possible. Aristotle and many others thought this was basically the truth, but developmental biology established that women are more than incubators.

Bias 2: Women invest a great deal in each egg; therefore, it pays them to be choosy, whereas men have very little invested in each sperm, since they make so many all the time, and so don't have to be choosy. This is the bias that Thornhill and Palmer hold. As they clearly state, “We . . . discuss these psychological adaptations in terms of male *sexual preferences* and female *mate choice*. The reason we use two different terms is that hu-

man females have a tremendous minimum necessary investment in each of their offspring” while men have a very small minimal investment.²⁰

But there’s a problem with this yin and yang theory of reproduction. Each egg can accommodate only one sperm. Males contribute just as much genetic material to the offspring as females do and have just as much of a genetic interest in the offspring—perhaps even more, since females provide only an X chromosome while males can give an X or a Y, and therefore determine the sex of the offspring.

Isn’t it interesting how, whether men contribute everything, as in the pre-Darwin scenario 1, or so little it’s hardly worth their bother to care where it goes, as in the post-Darwin scenario 2, the end conclusion is that men have a vested interest in spreading their seed around as far as possible while women have a vested interest in being choosy? Is this why choosy mothers choose Jif? Or could it be that the starting assumption is that it’s natural for men to spread seed widely and natural for women to be choosy, and, lo and behold, a theory (pre- or post-Darwin) is found to provide a support for that belief? Maybe this is why choosy mothers choose Jif! Or maybe choosy mothers choose Jif because they fear that otherwise they will be perceived as bad moms. And maybe rapists rape in part because they think other men will admire them for it or that it’s their prerogative as a male to have access to any woman they want at any time.²¹

“DO THEY HAVE TO BE WRONG?”

Thornhill and Palmer would argue that it doesn’t matter what any individual man gives as his reason for committing rape, since this is just the proximate cause. Ultimately, evolution is behind it all. As they state, “Rape behavior arises from elements of men’s sexual nature—their sexual psychology . . . [which] is characteristic of men in general.”²² They deny that their theory is one of genetic determinism, but their proposed solution assumes that all boys are potential rapists unless they are educated to be men who can resist their “evolved sexual desires.”²³ As Margaret Wertheim has noted, this view of human male nature is strikingly similar to that of “feminist extremists like Andrea Dworkin . . . [who] is routinely portrayed in the media as a half-crazed man-hating harpy.”²⁴ Yet, Thornhill and Palmer’s call for a *Minority Report*-like societal solution to rape has been presented by the media as a respectable and scientifically grounded approach that undermines feminist analyses of rape.²⁵

Thornhill and Palmer devote an entire chapter of their book to the question, “Why have social scientists failed to Darwinize?” and another to

denouncing the social scientific explanation of rape.²⁶ By *social scientists*, they mean feminists, as they explain: "Because the phrase 'feminist psychosocial analysis' is a bit awkward, we will refer to it as 'the social science explanation.'"²⁷ Feminists are depicted as suffering from biophobia, the sources of which are several: the naturalistic fallacy, or the belief that to admit something is natural is to admit it is good; the myth of genetic determinism, or the assumption that evolutionary explanations are based on the notion of genetically determined behavior; the failure to distinguish proximate from ultimate explanations; the perceived threat of biology to cherished ideology; and the perceived threat of biology to the status of those whose success is based on nonevolutionary theories.

The bulk of their argument against feminist theories of rape is devoted to (1) the red herring claim that feminists deny that rape is about sex, and (2) the claim that a combination of ideology and ignorance prevents feminists from accepting biological truth. Thornhill and Palmer disavow that culturally specific learning is relevant to the cause of rape, yet they propose a solution to rape that features a cultural-learning activity—teaching men not to rape. They accuse feminist, culturally based explanations of rape of being deterministic and inconsistent with free will. The evolutionary approach, however, offers the power of predicting "the developmental events of interest [that] occur in response to specific cues" that are likely to increase the proclivity of males to rape. This would allow humans to alter "environmental factors" that would help men consciously choose not to rape.²⁸

It would appear that both evolutionary psychologists and feminists agree that changes in environment/culture and in educational programs/learning are key to eliminating rape. So, what is really at stake here in setting up the feminism versus evolutionary psychology battle? In their chapter "Social Influences on Male Sexuality," the real issue is at last identified. It is the fear that acceptance of feminist theories of rape will degrade the status of males and destroy "male traditions" and traditional families. "The feminist view predicts that rape can be prevented only by a wholesale abandonment of male traditions."²⁹ Evolutionary psychology promises to eliminate rape while leaving male privilege intact. "In reality, though many aspects of patriarchal traditions may be undesirable for a variety of reasons, the abandonment of all male traditions that might be deemed patriarchal would be likely to *increase* the frequency of rape."³⁰ Feminists are cast in an ideologically motivated, antiscience role while science is claimed by evolutionary psychology in the service of patriarchy.

In her essay on *A Natural History of Rape*, Daphne Patai builds on Thornhill and Palmer's case against feminism.³¹ She argues that the problem with feminism is that it is nonscientific—that feminists are neither inspired nor limited in their conceptualizations of the problem of rape by scientific data or theory. In Patai's view, feminists are antagonistic to biological approaches to gender and sexuality. Indeed, feminism appears to require antagonism to scientific accounts of gender and sexuality to accomplish what Patai sees as its broader purpose of problematizing and attacking heterosexual sexual orientation and desire. Social constructivist accounts of gender, by contrast, give feminists the ability to create a world of their own liking and to keep the less desirable dimensions of scientific explanation at bay. In fact, Patai argues, it is because feminists misunderstand the scientific account of such phenomena as rape as utterly deterministic that they reject all uncomfortable scientific accounts.

There are several problems with this account of the repudiation of Thornhill and Palmer, but the most obvious one to those who examine the plethora of critical responses to *Natural History* is the overwhelmingly negative reception of the theory from scientists who make no claim to feminist political identification.³² In spite of the critiques of scientists who contend, for example, that the theory is "more of an ideological rant than an empirical, well-reasoned analysis,"³³ media accounts of the book and interviews with the authors focused attention on the divergence between science and politics. The implication is clear: only biophobic ideologists could disagree with Thornhill and Palmer's scientific narrative of rape as an adaptive sexual behavior.

For Thornhill and Palmer, as well as for their enthusiastic apologist Patai, culture is a product of biology so that cultural accounts—and condemnations—of rape attack the symptom of the issue, the proximate cause, rather than the ultimate cause. The ultimate cause of such social and cultural forms of behavior as rape is evolutionary development. Therefore, rape is not amenable to the kinds of feminist and social science critiques leveled at the problem by virtually all previous scholars.

"Do they have to be wrong?" is the plaintive question asked by Daphne Patai. They don't "have" to be wrong; that is, their conclusions should not be rejected merely because they are inconvenient to proponents of women's civil and political rights. However, as many critics have now pointed out, there is little to recommend their theory as science. And as I have shown, even if accepted as scientifically based, their theory contains numerous flaws and contradictions, and their proposed solutions are neither unique nor inevitable.

CONCLUSION

Patai defends Thornhill and Palmer against feminist critique of their theory while affirming its scientific basis and implications. She acknowledges the existence of scientific critiques but denies that these are the basis for any feminist rejections of Thornhill and Palmer's theory. Both Thornhill and Palmer and Patai draw a false dichotomy between feminists (who are not only not scientists but are, in addition, ideologically predisposed to reject scientific explanations) and scientists (who are unaffected by ideology and insulated against it by scientific method itself). Furthermore, ignorance and antiscience bias among feminists—and feminists only—are claimed to fuel the hostility against Thornhill and Palmer and the rejection of their theory.

Far from being impaired by a feminist lack of scientific knowledge and sophistication, as Patai suggests in her review, Thornhill and Palmer benefit from this lack in the general public. More, they appear to cultivate the look and feel of science for naïve readers and busy news consumers, which may explain why Patai is so easily convinced of the theory's validity and scientific nature. Journalists, political commentators, humanistic scholars, and ordinary citizens who lack the scientific sophistication to evaluate Thornhill and Palmer's theory, evidence, and conclusions are likely to be too impressed by the researchers' scientific claims and credentials and more credulous about the social implications they derive.

But who is to blame for the theory's reception as science: naïve readers or the authors who deliberately and deceptively claim the indisputable mantle of science with frequent assertions of the incontestability of their approach and findings? As an alumna of MIT, I find it particularly embarrassing to see the imprimatur of science given to this work through its publication by MIT Press. The extensive and uncritical media coverage that hailed the appearance of Thornhill and Palmer's book prompted MIT Press to push up the publication date by two months in an effort to capitalize on the "logical scientists versus angry feminists" controversy created by Thornhill and Palmer in their text and cultivated by and through the media.³⁴

In 2003, MIT Press will publish a book entitled *Gender, Evolution, and Rape*. Designed as a rebuttal to *Natural History*, Cheryl Travis's edited volume will offer "alternative models of rape, which incorporate psychology and cultural systems, as well as a broader interpretation of evolutionary theory."³⁵ This is reminiscent of another pairing of volumes that appeared at the end of the nineteenth century. In 1873, Edward H. Clarke published *Sex in Education, or, A Fair Chance for the Girls*.³⁶ Clarke's main thesis was that education would cause a woman's uterus to wither and decay,

and he, too, claimed the mantle of science to support his selective use of biological theory and data. In 1874, Julia Ward Howe spearheaded publication of a volume dedicated to a rebuttal of Clarke, based on actual data and experiences of women who had received higher education.³⁷

When I reflect on the time spent on this essay, the time spent by Howe and her colleagues over a hundred years ago on their book, or that spent by Travis and her colleagues today, I am frustrated by the loss to critique of time that could have been given to creative activity. However, it is every scientist's responsibility to engage in critique as well as creation; critique is an integral part of the scientific process. Furthermore, scientists have a responsibility to the public to share both creation and critique, to aid nonscientists in making reasoned choices about the influence and application of science in society. It will not do to lament in the laboratory that ideology draped in science is so easily accepted by the public, for if it is, it means we as scientists have not been engaged in sufficient dialogue with that public.

Social conservatives today can effectively wield "science" to support the conservative agenda in part because practicing scientists have in the past cared little for the scientific education of the general public. Far from being antiscience, feminism in the academy is one of the few places where large numbers of nonscientists are encouraged to grapple with what science has had to say about biology and destiny. Feminism, for me, has always been about asking more and better questions and continually questioning received wisdom, a description that can also be applied to science at its best. Feminists have been talking science for over a hundred years, and we'll keep doing so, wherever we find science misunderstood and misused.

NOTES

The title of this chapter refers to the song "She Blinded Me with Science" by Thomas Dolby from the 1982 album *Golden Age of Wireless* on EMD/Capitol Records.

1. Randy Thornhill and Craig T. Palmer, *A Natural History of Rape: Biological Basis of Sexual Coercion* (Cambridge, Mass.: MIT Press, 2000).
2. Thornhill and Palmer, *Natural History*, 53.
3. Daphne Patai, "Do They Have to Be Wrong?" *Gender Issues* (Fall 2000): 74–82.
4. Natalie Angier, "Biological Bull," *Ms.*, June/July 2000, 80–82.
5. Jennifer L. Pozner, "In Rape Debate, Controversy Trumps Credibility," *Fairness and Accuracy in Reporting*, 2000, at www.fair.org/extra/0005/thornhill.html

(accessed February 7, 2002); APB News.com, "Scientists Assail Controversial Rape Book," *APB News.com*, 2000, at www.apbonline.com/safetycenter/family/2000/03/08/rapebook0308_01.html (accessed February 7, 2002).

6. Thornhill and Palmer, *Natural History*, xii–xiii.

7. Margaret Wertheim, "Born to Rape?" *Salon.com*, 2000, at www.salon.com/books/feature/2000/02/29/rape/print.html (accessed February 7, 2002); Matt Cartmill, "Understanding the Evil that Men Do," *Chronicle of Higher Education* 46, no. 39 (2000), at www.chronicle.com/weekly/v46/i39/39b00401.htm (accessed February 7, 2002); Craig B. Stanford, "Darwinians Look at Rape, Sex, and War," *American Scientist*, July/August 2000, at www.sigmaxi.org/amsci/bookshelf/leads00/Stanford.html (accessed February 7, 2002).

8. Thornhill and Palmer, *Natural History*, xii.

9. Cartmill, "Understanding the Evil"; Stanford, "Darwinians Look at Rape"; Jerry A. Coyne and Andrew Berry, "Rape as an Adaptation," *Nature* 404 (March 9, 2000): 121–22; Wertheim, "Born to Rape?"; Dan Vergano, *USA Today*, 2000, at www.usatoday.com/life/health/sexualit/lhsex021.htm (accessed February 7, 2002).

10. Randy Thornhill and Nancy W. Thornhill, "Evolutionary Analysis of Psychological Pain of Rape Victims I: The Effects of Victim's Age and Marital Status," *Ethnology and Sociobiology* 11 (1990): 155–76. The criticism that the data in this paper are misinterpreted is made in Coyne and Berry, "Rape as an Adaptation."

11. Cartmill, "Understanding the Evil."

12. Thornhill and Palmer, *Natural History*, 14.

13. Thornhill and Palmer, *Natural History*, 29, emphasis in original.

14. Thornhill and Palmer, *Natural History*, 5.

15. Thornhill and Palmer, *Natural History*, 12–13.

16. Suzanne E. Franks, Annette C. Kuesel, Norbert W. Lutz, and William E. Hull, "³¹P-MRS of Human Tumor Cells: Effects of Culture Media and Conditions on Phospholipid Metabolite Levels," *Anticancer Research* 16 (1996): 1365–74; Suzanne F. Shedd, Norbert W. Lutz, and William E. Hull, "The Influence of Medium Formulation on Phosphomonoester and UDP-hexose Levels in Cultured Human Colon Tumor Cells as Observed by ³¹P-NMR Spectroscopy," *NMR in Biomedicine* 6 (1993): 254–63.

17. This philosophical quandary was humorously depicted in Douglas Adams's book *The Hitchhiker's Guide to the Galaxy* (Ballantine Books, 1995), wherein the ultimate answer to the ultimate question of life, the universe, and everything is found to be 42.

18. Thornhill and Palmer, *Natural History*, 181.

19. Thornhill and Palmer, *Natural History*, 182.

20. Thornhill and Palmer, *Natural History*, 39–40; emphasis in original.

21. Diana Scully and Joseph Marolla, "Riding the Bull at Gilley's: Convicted Rapists Describe the Rewards of Rape," *Social Problems* 32, no. 3 (February 1985): 251–63.

22. Thornhill and Palmer, *Natural History*, 194.

23. Thornhill and Palmer, *Natural History*, 180.

24. Wertheim, "Born to Rape?"

25. In the 2002 movie *Minority Report*, individuals are punished for murders they have not yet committed but which the authorities believe will occur if they are left alone.

26. Thornhill and Palmer, *Natural History*, ch. 5 and 6.

27. Thornhill and Palmer, *Natural History*, 123.

28. Thornhill and Palmer, *Natural History*, 153–54.

29. Thornhill and Palmer, *Natural History*, 176.

30. Thornhill and Palmer, *Natural History*, 177.

31. Daphne Patai, “Do They Have to Be Wrong?”

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33. Stanford, “Darwinians Look at Rape.”

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EDITED BY CYNTHIA BURACK & JYL J. JOSEPHSON

FUNDAMENTAL *differences*

FEMINISTS TALK **BACK** TO
SOCIAL CONSERVATIVES

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Feminists Talk Back to Social Conservatives

Edited by Cynthia Burack
and Jyl J. Josephson

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This volume is dedicated to the memory of
Rhonda M. Williams, whose life bent toward justice.

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