

Sex, Violence, and Sociobiology

Ann Gibbons, in her generally excellent Research News article "Evolutionists take the long view on sex and violence" (20 Aug., p. 987), concludes her account of the sociobiology of violence toward stepchildren with a discussion of "environmental" interpretations of the phenomenon (less attachment bonding, more emotional difficulties, and so forth). It is important to note that the evolutionary and the environmental are not mutually exclusive alternatives. Sociobiologists make an important distinction (regrettably, one that is less appreciated in the social sciences) between two domains of interpretation: "proximate" and "ultimate" causation.

The former involves immediate causative mechanisms; the latter, the evolutionary or adaptive significance of the trait in question. Complete explanation requires attention to both forms of causation. The two complement rather than exclude each other. Consider, for example, sexual behavior (in animals or humans). This complex trait could be "explained" by the interaction of hormones, brain mechanisms, experience, and so forth. No matter how "correct," however, such proximate factors do not conflict with the evolutionary significance of sexual behavior, which relates to success in projecting copies of one's genes into future generations. The ultimate evolutionary goal is served by a diversity of mechanisms in differing species and situations. Similarly, the presence of reduced bonding and increased emotional conflict within stepfamilies is in no way inconsistent with the sociobiological approach.

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Plutonium Policy

I disagree with some of the views expressed by Edwin Lyman, Frans Berkhout, and Harold Feiveson (Letters, 13 Aug., p. 813) about plutonium policy. The United States does not have the capability to fabricate mixed plutonium-uranium oxide (MOX) fuel because the Carter Administration effectively stopped it 15 years ago. It is obviously technologically and economically feasible, because the French company Cogema reprocesses at Cap la Hague, fabricates MOX fuel at Marcoule, and routinely delivers it to Electricité de France to burn in its 900-megawatt-electric pressurized water reactors.

Civil plutonium use is real and legitimate. It is meaningless to say that if the

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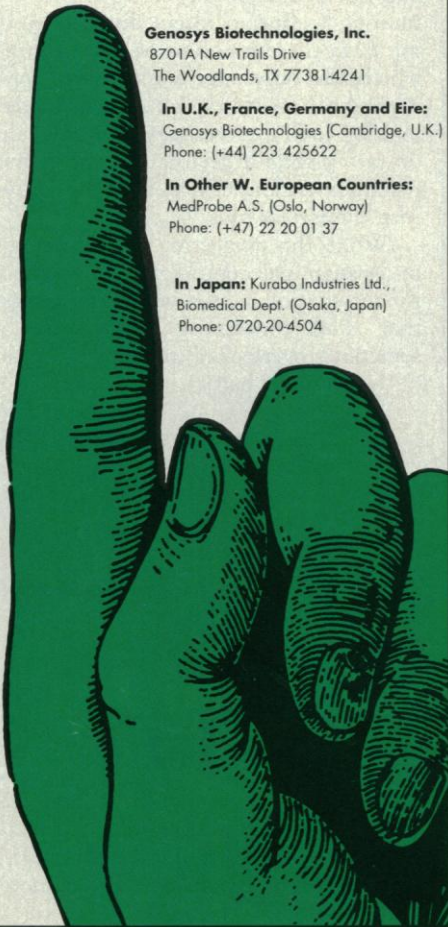
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¹ Anal. Biochem. 179: 37-49

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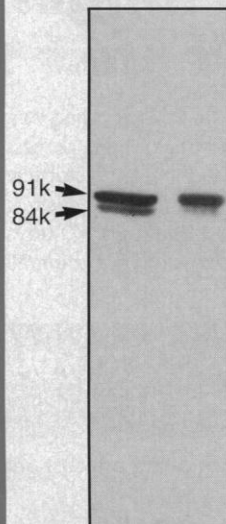
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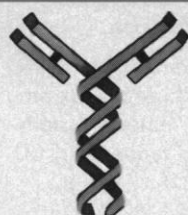
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United States takes steps to see that excess weapons plutonium is safeguarded and then ultimately burned as fuel, it will somehow "legitimize" what is already legitimate! Other nations are not throwing away billions of kilowatt-hours worth of energy by calling it "waste."

Nonproliferation goals can best be met by burning excess plutonium, as well as commercial reactor-grade plutonium, to produce energy. The marketplace might just pay that slight premium for reducing proliferation concerns.

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Russian Paleoentomology

Conrad C. Labandeira and J. John Sepkoski Jr. are to be commended for their stimulating synthesis of the fossil record of insects (Articles, 16 July, p. 310). However, one of their most interesting insights, that familial diversity of insects does not show the expected rise associated with the radiation of angiosperms, was anticipated by B. B. Rodendorf and V. V. Zherikhin (1, cited by Labandeira and Sepkoski for other purposes). Rodendorf and Zherikhin actually noted a Late Cretaceous decline in insect diversity resulting from the extinction of older families, which was only later compensated for by diversification of new families; Labandeira and Sepkoski's curves may show a leveling off rather than a decline because of more recent extensions of taxa from the Tertiary into the Cretaceous.

While the pioneering descriptive work of Russian paleoentomologists is gaining the recognition it deserves, it is unfortunate that their conceptual contributions are sometimes overlooked, presumably because of the language barrier.

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References

1. B. B. Rodendorf and V. V. Zherikhin, *Priroda* 1974 (no. 5), 82 (1974).

Breaking the Mold at OSTP

Jeffrey Mervis writes that M. R. C. Greenwood and Jane Wales are "only the second and third women to hold top jobs at OSTP [the Office of Science and Technology Policy]" ("Gibbons breaks mold on ap-

pointments," *News & Comment*, 20 Aug., p. 979). During my tenure as Science Advisor to the President and Director of OSTP, three of the five top positions were held by highly qualified women assistant directors who reported directly to me. Although they, along with most other senior members of the White House staff, were not confirmed by the Senate, these assistant directors [Beverly Berger (Life Sciences), a statistical geneticist who also handled much of the physical sciences; Michelle Van Cleave (National Security and Legal Counsel), a lawyer and previously a senior member of the congressional staff; and Deborah Wince-Smith (International Affairs and Global Competitiveness), an archeologist and official of the National Science Foundation] actively participated with sub-Cabinet presidential appointees as principals in high-level policy development and implementation on many critical issues.

If there was an OSTP "mold," first Bernadine Healy (as Mervis notes) and then these three assistant directors certainly broke it.

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Tree Authentication

I was pleased to see Barry Cipra's "Electronic time-stamping: The notary public goes digital" (9 July, p. 162). The use of one-way hash functions is a powerful and underappreciated tool in authentication. The interested reader can find a discussion of tree authentication in my book *Secrecy, Authentication, and Public Key Systems* (UMI Research, Ann Arbor, MI, 1982) or in U.S. Patent 4,309,569 (filed 5 September 1979).

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Corrections and Clarifications

In the article "In vitro transcriptional activation by a metabolic intermediate: Activation by Leu3 depends on α -isopropylmalate" by Ji-Ying Sze *et al.* (13 Nov. 1992, p. 1143), the second sentence of the legend to figure 1 should have read, "In vitro transcription was carried out as described (6) with 1.2 μ g of pUC18 and 0.3 μ g of each template per 30- μ l reaction."