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The Agroecological Opium of the Masses

by

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The history of all hitherto existing agriculture is the history of industrialization. Four decades after the term "agribusiness" entered the American language, we can no longer deny the irreversible industrialization of food production in the United States. The only question left is whether this transformation of agriculture bodes ill or well for the environment.

But a specter is haunting American agriculture, the specter of agroecological ideology.[1] "Sustainable agriculture" is on the verge of political capture, of being corrupted into the most recent variant of "agricultural fundamentalism." At their height, the fundamentalist preachers of agrarian supremacy defended price and income support for farmers by arguing that every dollar of gross farm income generated seven dollars of national income. Today, concerns over "farm size" motivate the self-described sustainability advocates who argue that "the goal of sustainable agriculture programs should be to serve small or family farmers instead of large corporate farms."[2] Under a strict definition of sustainability, however, "[s]ustainable agriculture consists" simply of "processes involving biological activities of growth or reproduction intended to produce crops, which do not undermine our future capacity to successfully practice agriculture" and which do not "exhaust any irreplaceable resources which are essential to agriculture."[3]

The quest for sustainability has therefore reached a crucial moment of truth. Will the drive for sustainability remain true to alternative agriculture's "urgent concern over the ecological aspects of agriculture," or will it dissolve into nothing more than "the latest manifestation of the ongoing struggle between agrarianism and industrial concentration," yet another debate over the economic characteristics of individual farms, the distribution of productive assets in agriculture, and the number of managerial job opportunities in farming?[4]

Most rhetorical questions come prepackaged with rhetorical answers, and mine is no exception: Environmental integrity can occur in a corporate environment. Witness the use of organic viticultural techniques by Gallo Brothers and the practice of integrated pest management by the Mall of America. To assert otherwise is to make environmental*ism* contingent upon the pecuniary preferences of environmental*ists*.

Unless we can decouple the notion of sustainability from issues of farm income and economic viability in agriculture, the sustainable agriculture movement will have accomplished little more than the greatest rhetorical coup since certain partisans in the American debate over abortion fashioned the phrase "pro-life." There are now as many self-described champions of "unsustainable agriculture" as there are overt supporters of the "pro-death" crusade. Unless we expect to feed ourselves on rhetoric alone, however, we must define exactly what it means to "sustain" agricultural production.

Virtually every adherent of the agroecological ideology emphasizes the land on which we farm, the land that feeds us. Thus contemporary admirers of Aldo Leopold celebrate the gift of good land and solemnly admonish us all that our patterns of consumption must meet the expectations of the land. The new environmental awareness supposedly marks an intellectual shift from a mechanical model of agriculture to an ecological model. All of this rhetoric would be far more credible if the agroecological agenda did not so transparently disguise a willingness to sacrifice environmental objectives whenever they conflict with the greater interest in protecting incumbent farmers at all costs.

Das hormon: the hormone wars

The reaction to the latest agricultural innovation to alter the American dairy market, recombinant somatotropin (rbST), confirms the true nature of support for environment-enhancing developments in contemporary agriculture. Recombinant somatotropin—or recombinant bovine growth hormone (rBGH), as the drug's opponents prefer to call it—represents a rather modest biotechnological advance. Because it is merely the synthetic form of a natu-

rally occurring hormone that stimulates milk production, the creation of rbST is a rather crude extension of the scientific revolution launched by Friedrich Wöhler's synthesis of urea from ammonium cyanate in 1828. In 1937, Russian scientists correctly hypothesized that some chemical produced by the anterior pituitary gland controlled bovine lactation. American scientists eventually concluded that bST governed the efficiency with which cows absorbed nutrients and thereby produced milk. By extracting bST-stimulating genes from bovine pituitary glands and splicing them into rapidly reproducing *E. coli* bacteria, bioengineers have facilitated the large-scale, economically feasible synthesis of rbST. In 1982, the first trials demonstrated that recombinant bST could be used to boost milk production in a safe, cost-effective fashion.

Recombinant somatotropin did not ambush the American dairy industry. The product's entry into the market was long expected; threatened dairy farmers had ample time to adjust to a market that would inevitably change. No other recent legal event in American agriculture, however, has provoked as much agrarian anger as the Food and Drug Administration's (FDA) decision to permit the use of rbST in milk production.

Fully expecting the FDA to approve rbST sometime in late 1993, Congress preemptively imposed a ninety-day moratorium on rbST sales after the date of any such approval. A concurrent ninety-day delay in an otherwise scheduled reduction in federal milk price supports cost taxpayers an additional $5 million in milk subsidies. Given the extraordinarily income-inelastic nature of milk demand, Congress's resistance to the expected decrease in milk prices disproportionately hurt the poorest, youngest consumers of milk.

Legislators representing Wisconsin and Vermont—two states whose dairy farmers expected to lose the most from widespread adoption of rbST—proposed even more ambitious legislation to extend the rbST moratorium, to require the labeling of milk and milk products from rbST-treated cows, and to reduce price support for dairy producers who inject rbST into their cows. Several states, especially in New England and the Upper Midwest, have authorized voluntary labeling schemes. A few have even considered mandatory labeling statutes. Throughout the spring and summer of 1994, legislative activity was so intense that several agricultural interest groups were able to report "rBGH news of the week."

Currently, American agricultural policy regarding rbST use takes the form of piecemeal second-guessing by state legislatures of a scientific judgment made by the FDA as the United States's legally designated, nationwide expert agency on food and drug safety. Before assessing whether the risks to human health can justify such a violent regulatory reaction to rbST, I am prepared to eliminate animal health for its own sake from the list of substantial concerns. To the extent that rbST impairs treated cows' reproductive performance or "adversely affect[s] the processing characteristics of milk," economically rational farmers will weigh the technology's benefits against its fully internalized costs.[5] Moreover, the very business of dairy production is fundamentally incompatible with the notion of animal rights. Milk is meat, for every dairy cow put into production bears calves des-

tined to become veal. Every cow eventually becomes a mound of ground beef. *Homo sapiens* does not build cemeteries for pet dairy cattle. Perhaps she should, but she does not.

No, something else is at work. The pungent odor of producer protectionism permeates the legislative air.

Recombinant somatotropin does not endanger human health. Cow's milk naturally contains bovine somatotropin. There is no significant compositional difference between Milk Classic from untreated cows and New Milk from treated cows. The presence of a few extra amino acids on the end of the recombinant bST molecule has no impact on the hormone's biological activity. Thanks to the hormone's unique three-dimensional shape, neither natural nor synthetic bST can bind itself to human cell surfaces. Although the Office of Technology Assessment initially thought that rbST use boosts levels of insulin-like growth factor 1 (IGF-1) in milk, more recent studies by the FDA and the Food and Agricultural Organization of the United Nations have concluded that rbST supplementarion of cows does not affect the IGF-1 content of milk. In any event, the total amount of IGF-1 in a liter of milk approximates the amount in the saliva swallowed daily by an adult. Accordingly, any IGF-1 that enters the bloodstream after digestion "is insignificant compared to the daily endogenous human exposure."[6]

Stripped of its fraudulent claims to ethical and medical integrity, the campaign against rbST is a battle waged by economically endangered entities against the rest of society.

Recombinant somatotropin's opponents have also argued that the hormone poses an indirect threat to human health by increasing the incidence of mastitis in treated cows, which would lead to increased use of antibiotics by dairy farmers. (Never mind the mountain of scientific data showing "that treatment with BST [has] had no effects of biological importance on mastitis-related variables.")[7] The agrarians have never explained why stringent enforcement of rules against marketing milk from diseased cows would fail to address any mastitis problem that did exist. Nor have rbST's opponents explained why Congress and state legislatures should be content merely to label a product that poses such a dire threat to the public health. One member of Congress who opposed the rbST approval inadvertently stated his constituents' true priorities on this issue: "BGH not only threatens the survival of the family farm—it also is a threat to public health." Farmers come first; consumers are, at best, an afterthought.[8]

The political circus surrounding the approval of rbST has obscured the drug's potentially beneficial environmental impact. The misleading description of rbST's sole purpose as "enhanc[ing] the production of a product that is already in surplus"[9] detracts attention from the commodity that is truly in surplus: dairy cows. By increasing each cow's milk output in a market where demand for milk will likely remain relatively constant, rbST reduces the total number of cows in production. Although a treated cow's greater milk output increases her total energy requirement, rbST improves the cow's efficiency in converting nutrients to milk and reduces the amount of nutrition needed to keep the cow alive.[10]

In other words, treating cows with rbST buys more milk production without proportionally increasing the bovine demand for scarce and environmentally costly nutrients. Put plainly, rbST and other advanced dairy technologies "allow for the production of milk with a lower resource input."[11] Fewer cows mean fewer methane emissions, less manure, less acreage dedicated to feed for dairy cows, less water committed to the quenching of bovine thirst. Recombinant somatotropin's "green" effect foreshadows the promise of genetically engineered, pest-resistant plant varieties that will reduce farmers' reliance on chemical pesticides.[12]

Throughout the rbST debate, one might have expected genuine protectors of the environment to consider the relationship between productivity and environmental impact. A single set of ecological formulae—hundredweights of milk per kilogram of manure, per liter of urine, per cubic meter of methane—would have illuminated the potential environmental impact of widespread hormone use in the U.S. dairy industry. Such analysis does exist—within the work of dairy scientists whose work made rbST a practical reality. At no time have enemies of rbST, *especially* those who justified their opposition on agroecological grounds, even examined this issue.

According to Dale E. Bauman, one of America's foremost dairy scientists, rbST adoption by the entire American dairy industry would help the environment by effecting the following annual reductions in inputs and waste products:

Inputs:

- The food energy contained in 2.5 billion kilograms of corn
- The protein contained in 56 million kilograms of soybean oil meal

Waste products:
- 6 billion kilograms of bovine manure
- 8 billion liters of bovine urine
- 80 million kilograms of urinary nitrogen
- 80 billion liters of methane

If every American dairy farmer deployed rbST, the industry's reduced demand for feed would equal 0.62 percent of the corn that Americans fed to farm animals in 1988. America's population of dairy cows, 10 million strong in 1988, would also decline by more than a tenth. Imagine the potential environmental benefits of being able to quench America's thirst for milk with a million fewer cows.[13]

But fewer dairy cows also mean fewer dairy farmers. "With each cow producing more milk, the nation's milk needs can be supplied with fewer cows, less land, and fewer people in the dairy industry."[14] Furthermore, reducing the number of cows per farm increases each farm's relative investment in nonbiological inputs. Under a set of more sanguine economic assumptions, of course, on-farm employment prospects might actually improve; a rapidly modernizing dairy industry may demand a generation of on-site managers with greater technological proficiency. Even so, let us assume the worst. Softening the harsh environmental impact of dairy production through Monsanto's meek drug will come at the expense of a few dairy farming jobs. Confronted with a choice between a cleaner environment and reduced employment prospects for incumbent dairy farmers, the agroecological ideologues have unequivocally sided with the farmers.

Regardless of the outcome of today's milk wars, the biotechnological revolution in dairy production will surely continue. Already, bioengineers have successfully used nuclear transplantation to clone transgenic calves.[15] Although "the lack of knowledge about the relationship between the expression of a specific gene and the physiological consequences" of that gene currently blocks the production of "transgenic cattle possessing traits of economic value,"[16] cows that have been transgenically altered to produce high levels of natural bST could eventually supplant rbST use altogether. Barring changes to current law, bioengineered Bossie will surely be patentable. The porential shock to the farm economy will undoubtedly draw Congress even further into the battle over biotechnology.

O brave moo world, that has such creatures in it!

The tempest over rbST represents an ill omen of things yet to come, the harbinger of a far greater war against consumer welfare and environmental integrity. An overwhelming body of scientific evidence attests to the safety of rbST use. The prospect of reducing environmental damage while continuing to satisfy the public's demand for milk would tantalize any genuine friend of Mother Earth. Every legislative proposal to limit the hormone's use therefore has a normatively pernicious objective: permitting a subclass of Luddite farmers in the United States to continue resisting cost-reducing, resource-conserving technology simply for tradition's sake. Stripped of its fraudulent claims to ethical and medical integrity, the campaign against rbST is a battle waged by economically endangered entities against the rest of society.

The consumerist manifesto

Seduced by an agrarian literary tradition stretching from Little Bo Peep to Little House on the Prairie, we Americans have forgotten an ugly but essential truth about production agriculture: farming is not an environmentally benign activity. Compelling the

earth to yield only such fruits as will sate human hunger and slake human thirst necessarily upsets the balance of nature. In one of the richest ironies in this enigmatic corner of American law and politics, the same farmers who opportunistically designate themselves the divinely foreordained stewards of the land[17] ordinarily frame the legal "right to farm" as a blanket exemption from nuisance law, a mild and basic common law tool for protecting the public against environmentally destructive uses of land. In each of the fifty states that exempt farmers from liability for their nuisances, agricultural pollution that limits every other conceivable use of increasingly scarce land is tolerated as the sacrosanct foundation of the "right to farm."

Thanks in part to a Western moral heritage "that

views material concern as a defect in human nature," we Americans have slipped into "a romantic view of man's relationship to the natural world."[18] Having forgotten that ours is a "fallen world,"[19] we have swallowed the fallacy "that technology alienates man from both the natural world and from the natural community."[20] Perhaps we should ask "the Taiwanese farmer [who] harvests a yield of 6 tonnes of rice from his 1 hectare" by using advanced agricultural technology whether he "feels a greater alienation than his father who realized less than 2 tonnes of rice from his efforts."[21] In the harshly competitive markets of the twenty-first century, the United States cannot afford an ideology that condemns "continued declines in the real costs of production."[22] Nor can the rest of the world, not when unprecedented rates of population growth outstrip the productive capacity of traditional agricultural systems.

Agriculture remains the only major industry for which the leading policy prescription consists of reflexive resistance to technological evolution.

Don Paarlberg once wrote that "the most important event that has happened in agriculture during [his] lifetime" was agriculture's loss of "uniqueness." In this one instance, and perhaps only in one sense, Paarlberg is dead wrong. Agriculture remains the only major industry for which the leading policy prescription consists of reflexive resistance to technological evolution. Agriculture alone vilifies its own scientists, turning them from the "true revolutionaries of the twentieth century" and "the liberat[ors] of man from the limitations of the natural world"[23] into the serpents of the agroecological paradise. Among the numerous industries that convert natural resources for human consumption, only agriculture claims that it positively transforms the environment.[24] Is it any wonder that the agricultural policy of the world's most productive agricultural nation "has focused" almost exclusively "on losers"?[25]

Agrarian tradition routinely describes farming as a labor of love. It may be impossible to contest this proposition without smelling the stench of cow manure every minute of the waking day, without walking in trousers drenched with the blood of slaughtered hogs. But this much is within the reach of any urbanite willing to overcome the dual handicap of agricultural illiteracy and bucolic sentimentalism: the agrarian dogma of producer primacy rests solely on a love of labor. American agriculture's commitment to distributive justice will appear far more sincere when its advocates treat consumer welfare as a legitimate component of societal interest in agriculture and not as an inconvenient detail in a futile campaign to maximize demand for the labor of the farm sector's entrepreneurial class.

Consumers of the world, unite. You have nothing to lose but your bucolic illusions. You have a world to win. ■

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The legal and economic arguments underlying this paper are more fully developed in Professor Chen's article, "The American Ideology," published in the Vanderbilt Law Review *(Vol. 48, May 1995, pp. 809–77).*

Editor's note: The endnotes found below are a departure from our usual reference style; however, an exception is made in this case to allow the author to substantiate sometimes controviersial assertions and to properly credit original sources of material.

Notes

1. Compare Karl Marx and Friedrich Engels, "Manifesto of the Communist Party," in *The Marx-Engels Reader.* Robert C. Tucker, ed., p. 331, 335, New York: W.W. Norton, 1972 ("A spectre is haunting Europe—the spectre of Communism.").

2. Council for Agricultural Science and Technology, *Sustainable Agriculture and the 1995 Farm Bill,* p. 9-10, Special Pub. No. 18, Ames, IA, April 1995.

3. Hugh Lehman, E. Ann Clark, and Stephan F. Weise, "Clarifying the Definition of Sustainable Agriculture," *J. Agr. and Environ. Ethics* 6(1993):127, 139.

4. Curtis E. Beus and Riley E. Dunlap, "Conventional Versus Alternative Agriculture: The Paradigmatic Roots of the Debate," *Rural Sociol.* 55(1990):590, 595.

5. See Emilio Esteban et al., "Reproductive Performance in High Producing Dairy Cows Treated with Recombinant Bovine Somatotropin," *J. Dairy Sci.* 77(1994):3371; Kerst Stelwagen et al., "Effect of Milking Frequency and Somatotropin on the Activity of Plasminogen Activator, Plasminogen, and Plasmin in Bovine Milk," *J. Dairy Sci.* 77(1994):3577, 3577–78.

6. Letter from Richard H. Teske to Samuel S. Epstein, at 1 (7 March 1994) ("[T]he [FDA] has received and reviewed several more comprehensive studies [that] have demonstrated that the IGF-1 content of milk is *not* altered by BST supplementation."); see also J.F. Hocquette et al., "The Human Liver Growth Hormone Receptor," *Endocrinology* 125(1989):2167, 2172; J.C. Juskevich and C.G. Guyer, "Bovine Growth Hormone: Human Food Safety Evaluation," *Science* 249(1990):875, 877; M. Wallis, "The Molecular Evolution of Pituitary Hormones," *Biol. Rev.* 50(1975):35, 62–63, 67–68; Food and Agr. Org., United Nations, *Bovine Somatotropins* 113-42 (1993) (U.N. Doc.

No. 41/5); Peter D. Gluckman et al., "The Effects of Growth on Lactation and Performance in Ruminants and Humans: Mechanisms of Action and Effects on Milk Hormone Composition," in *NIH Technology Assessment Conference Abstracts* (1990):41.

7. D.E. Bauman et al., "Somatotropin (BST)," International Dairy Federation Tech. Rep. 293, pp. 2, 4, 1994; see also D.G. McClary et al., The Effects of a Sustained-Release Recombinant Bovine Somatotropin (Somidobove) on Udder Health for a Full Lactation," *J. Dairy Sci.* 77(1994):2261 ("No evidence existed of an association between somidobove administration and the incidence or duration of clinical mastitis.")

8. *Cong. Rec.* 139(1 April 1993):E888, E888 (statement of Rep. Sanders); compare *Cong. Rec.* 136(7 February 1990):H310-01, H310 (statement of Rep. Smith) (criticizing the unknown impact of rbST use on "the economic stability of...smaller family-owned farms" before contemplating the hormone's effect on "consumer trust in dairy products").

9. *Cong. Rec.* 139(1 April 1993):E888, E889 (statement of Rep. Sanders).

10. See National Research Council, "Metabolic Modifiers: Effects on the Nutrient Requirements of Food-Producing Animals," 26(1994); Dale E. Bauman, "Bovine Somatotropin: Review of an Emerging Animal Technology," *J. Dairy Sci.* 75(1992):3432, 3436–37; W. Chalupa and D.T. Galligan, "Nutritional Implications of Somatotropin for Lactating Cows," *J. Dairy Sci.* 72(1989):2510.

11. Dale E. Bauman, "Frontiers of Improved Productive Efficiency by Dairy Cows," in proceedings of the Governor's Conference on Agricultural Science and Technology, Albany NY, 9–10 November 1993, pp. 345, 347.

12. See Northrup King Co. and Ciba-Geigy Corp., *Fed. Reg.* 60(EPA, 15 February 1995):8658 (authorizing the experimental planting of corn that has been genetically altered to produce the plant pesticide *Bacilus thuringiensis* subsp. *Kurstaki* Cry IA(b) insect control protein), amended, *Fed. Reg.* 60(15 March 1995):13,984; Karen Schmidt, "Genetic Engineering Yields First Pest-Resistant Seeds," *Science* 265(1994):739.

13. American farm animals consumed the equivalent of 445 million tons of corn in 1988, or nearly 403 billion kilograms. See U.S. Department of Agriculture, *Agricultural Statistics*, p. 54, 1993. Bauman's estimate of 2.5 billion kilograms in reduced demand for corn is roughly 0.62% of this figure. Bauman, above note 10, p. 3447. See generally D.E. Johnson, G.M. Ward, and J. Gorrent, "The Environmental Impact of Bovine Somatotropin Use in Dairy Cattle," *J. Environ. Quality* 21(1992):157.

14. Daniel W. Bromley, "Technology, Technical Change, and Public Policy: The Need for Collective Decisions," *CHOICES* 2nd Quarter 1991, p. 5.

15. "Transgenic animals are those whose DNA, or hereditary material, has been augmented by adding DNA from a source other than parental germplasm, usually from different animals or from humans." U.S. Congress, Office of Technology Assessment, *New Developments in Biotechnology: Patenting Life*, p. 12–13, 1989; see K.R. Bondioli, M.E. Westhusin, and C.R. Looney, "Production of Identical Bovine Offspring by Nuclear Transfer," *Theriogenology* 33(1990):165; J.M. Massey, "Animal Production Industry in the Year 2000," in W. Hansel and B.J. Weir, eds., "Genetic Engineering of Animals," *J. Reproduction and Fertility* (1990), 199; R.S. Prather and N.L. First, "Cloning Embryos by Nuclear Transfer," in "Genetic Engineering of Animals," above, p. 125.

16. U.S. Congress, Office Of Technology Assessment, *U.S. Dairy Industry At A Crossroads: Biotechnology And Policy Choices*, p. 59, Washington DC, 1991.

17. See generally Jim Chen, "Of Agriculture's First Disobedience and Its Fruit," *Vand. L. Rev.* 48(1995):1261; compare Jim Chen, "The American Ideology," *Vand. L. Rev.* 48(1995):809, 835–36 (noting that "mere landownership does not automatically give rise to 'stewardship'").

18. Vernon W. Ruttan, "Agricultural Scientists as Reluctant Revolutionaries," *Interdiscip. Sci. Revs.* 7(1982):170, 175.

19. See generally Donald Worster, *Nature's Economy: A History of Ecological Ideas*, 2nd ed., pp. 115-29, Cambridge MA: Cambridge University Press, 1985 (recounting how Charles Darwin and Herman Melville's observations on the apparent moral ambivalence of nature shattered the Victorians' romantic view of biology).

20. Ruttan, above note 18, p. 175.

21. Ibid.

22. Vernon W. Ruttan, *Increasing Productivity and Efficiency in Agriculture*, *Science* 231(1986):781.

23. Ruttan, above note 18, p. 170.

24. See, e.g., West Lynn Creamery, Inc. v. Healy, *Supreme Court Reporter* 114 (1994):2205, 2217 (rejecting as unsubstantiated the claim that dairy farming preserves "unique open space" and provides other "environmental benefits").

25. D. Gale Johnson, "U.S. Agricultural Programs as Industrial Policy," in S.R. Johnson and S.A. Martin, eds., pp. 307–8. *Industrial Policy for Agriculture in the Global Economy*. Ames IA: Iowa State University Press, 1993.

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