



## Human enhancement

I read with interest Maxwell J. Mehlman's "Biomedical Enhancements: Entering a New Era" (*Issues*, Spring 2009).

My principal association with biomedical enhancements has been in connection with sport as a member of the International Olympic Committee and, from 1997 to 2007, as chairman of the World Anti-Doping Agency. This is a somewhat specialized perspective and is only a subset of the full extent of such enhancement, but I think it does provide a useful platform from which to observe the phenomenon.

Let me begin by saying that the advancement of science and knowledge should not be impeded. Neither science nor knowledge is inherently "bad." We should be wary of any society that attempts to prohibit scientific research or to tie it in some way to ideology.

On the other hand, once knowledge exists, there may well be value judgments to be made regarding the circumstances and application of such knowledge. Some may be confined to the personal and the freedom of individuals to do what they wish with their own bodies, however grotesque may be the outcome. Other judgments, perhaps even impinging on the personal, may justify some effort, even if perceived as paternalistic, to be certain that decisions are fully informed and risks under-

stood. Still others may require collective or selective prohibition, either by the state or by direct agreement.

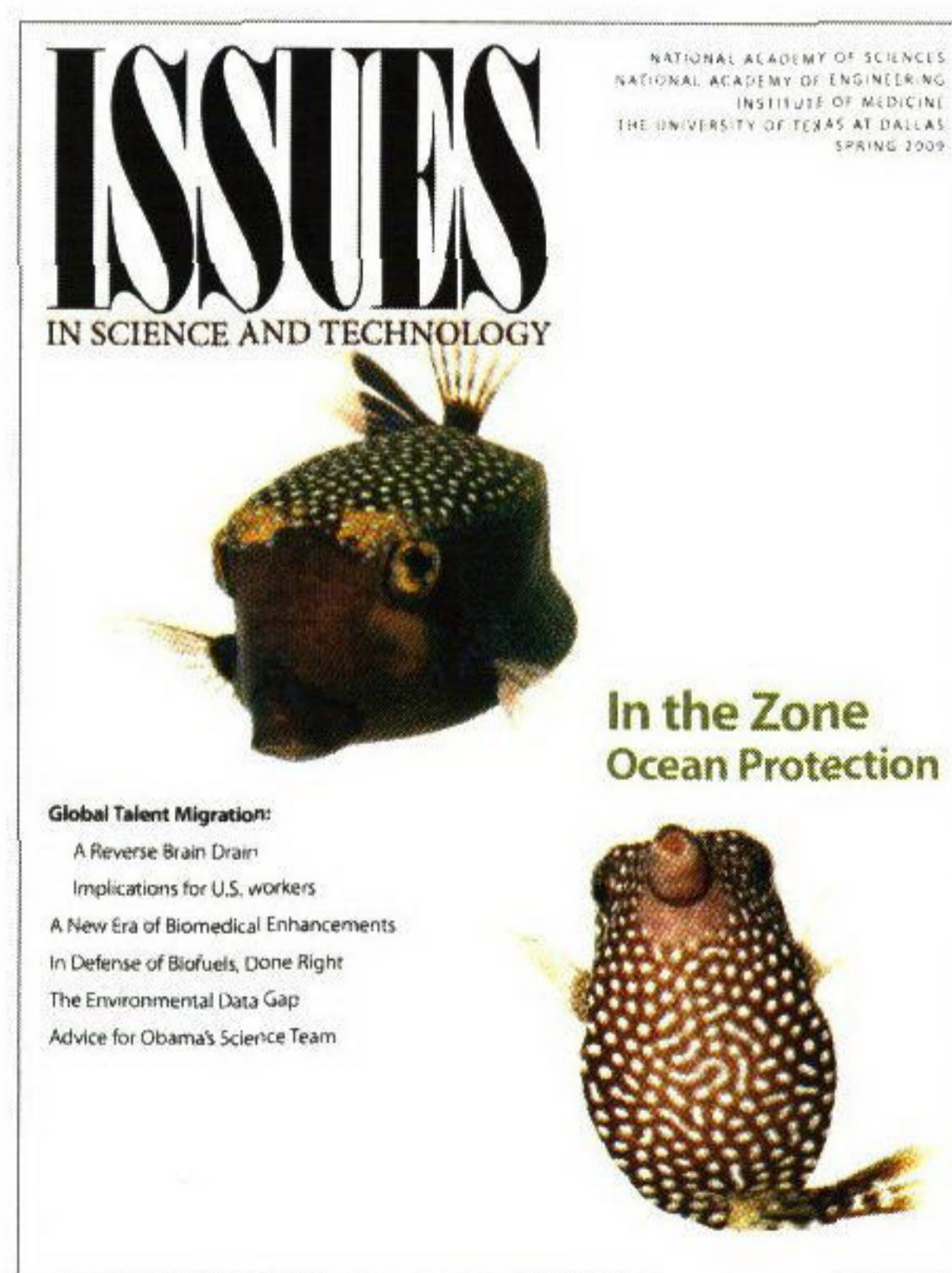
Sport has generally proceeded by agreement in relation to enhancements. Participants agree on all aspects of sport, including the rules of the game, scoring, equipment, officiating, and other areas, as well as certain substances or enhancement techniques that the participants will not use. In this respect, the initial concern was the health of the athletes (many of whom have little, if any, knowledge of the risks involved), to which was added an ethical component, once consensual rules were in place to prohibit usage. This consensual aspect is what makes drug use in sport "bad"—not the drugs themselves, but the use of them notwithstanding an agreement

among participants not to do so. It follows, of course, that anything not prohibited is allowed.

Given the ubiquitous character of sport in today's society, it is often the lightning rod for consideration of enhancements, and we should resist those who try to lump all enhancements into the same category, or excuse all because one might be justifiable. If military or artistic or attention deficit syndrome-affected individuals can benefit from enhancements within acceptable risk parameters, and the resulting enhancement is considered acceptable, it does not follow that such societal approbation should necessarily spread to sport, whose specific concerns are addressed within its particular context. If that context changes over time, mechanisms exist to change the sport rules, but until they are changed, they represent the deal willingly agreed to by all participants, who are entitled to insist that all participants abide by them. There is no reason why any athlete should be forced to use enhancements simply because another athlete, who agreed not to do so, is willing to cheat.

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## Eva Sutton

Eva Sutton is a digital media artist, photographer, and programmer. Her current work explores the boundary between static images and interactive databases in which users change the visual state of the system. Before becoming an artist, Eva was a software engineer working primarily in the fields of biotechnology and large-scale database management. Her work has been featured at Aperture, SF Camera-work (San Francisco) Exit Art (New York), The Santa Barbara Museum of Art, The Tang Museum, The National Center of Photography in Paris, SIGGRAPH, and the on-line sites Digital Imaging Forum ([www.art.uh.edu/dif](http://www.art.uh.edu/dif)), [www.genomicart.org](http://www.genomicart.org), and [www.pbs.org](http://www.pbs.org). Sutton teaches digital media and photography at the Rhode Island School of Design. She lives and works in New York City.

*Hybrids* is an interactive installation that enables the user/viewer to access a database of images to create their own imaginary animals that combine parts of mammals, birds, fish, insects, and other organisms. The created images reflect evolution that has taken place over eons through random mutation and natural selection as well as the newly developed human ability to manipulate organisms with genetic engineering.

Maxwell J. Mehlman outlines a compelling case for why banning human enhancements would be ineffective and, most likely, more harmful to society than beneficial. He and I share this view. Thus, he highlights the inadequacy of expanding arbitrary enhancement prohibitions that are found in normative practices, such as sport, to the wider world. He also explains why prohibition for the sake of vulnerable people cannot apply to the competent adult, although he acknowledges that certain human endeavors often compromise informed consent, such as decisions made within a military environment. He doubts that traditional medical ethics principles would be suitable to govern the expansion of medical technologies to the nonmedical domain. In so doing, Mehlman points to the various examples of enhancement that already reveal this, such as the proliferation of dietary supplements. Mehlman also draws attention to the likely “enhancement tourism” that will arise from restrictive policies, rightly arguing that we should avoid this *state of affairs*.

However, Mehlman’s argument on behalf of human enhancement offers the negative case for their acceptance. In response, we might also derive a positive case, which argues that our acceptance of enhancement should not arise just because prohibition would be inadequate or morally indefensible. Rather, we should aspire to find positive value in its contribution to human existence. The story of how this could arise is equally complex, though Mehlman alludes to the principal point: When it comes to enhancement, one size doesn’t fit all.

One can describe the positive case for human enhancement by appealing to what I call biocultural capital. In a period of economic downturn, the importance of cultural capital, such as

expert knowledge or skills, becomes greater, and we become more inclined to access such modes of being. In the 21st century, the way we do this is by altering our biology, and the opportunities to do this will become greater year after year. In the past, mechanisms of acquiring biocultural capital have included body piercing, tattooing, or even scarification. Today, and increasingly in subsequent years, human enhancements will fill this need, and we see their proliferation through technologies such as cosmetic surgery and other examples Mehlman explores.

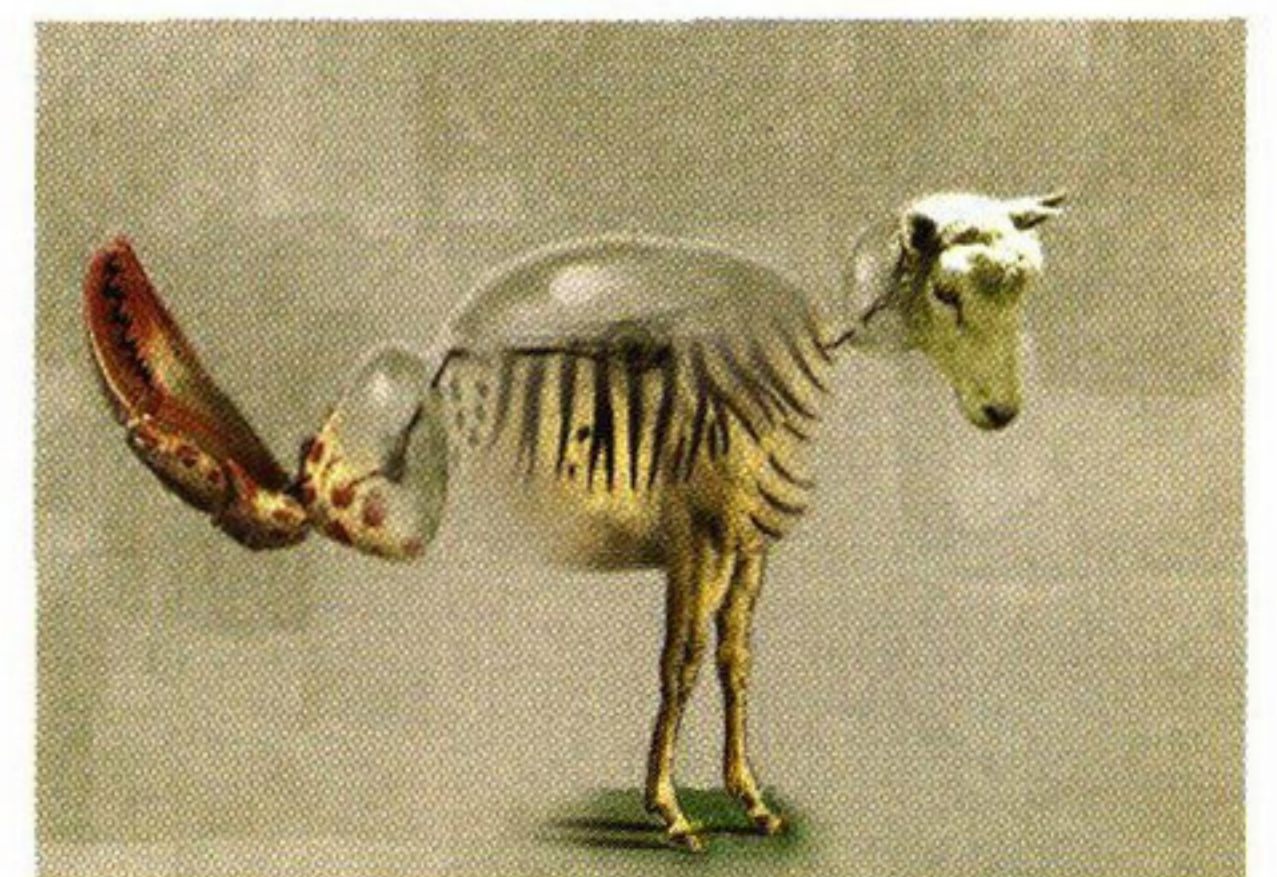
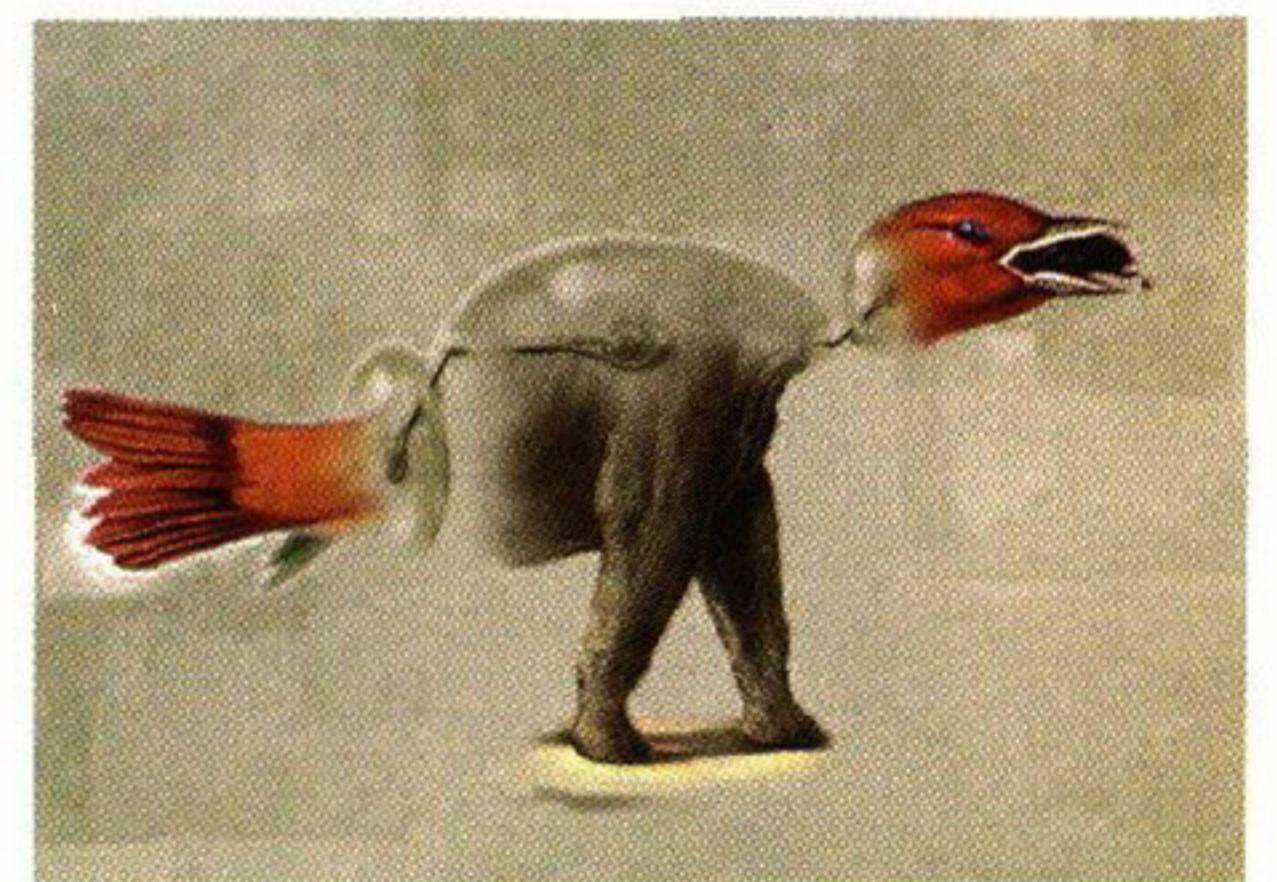
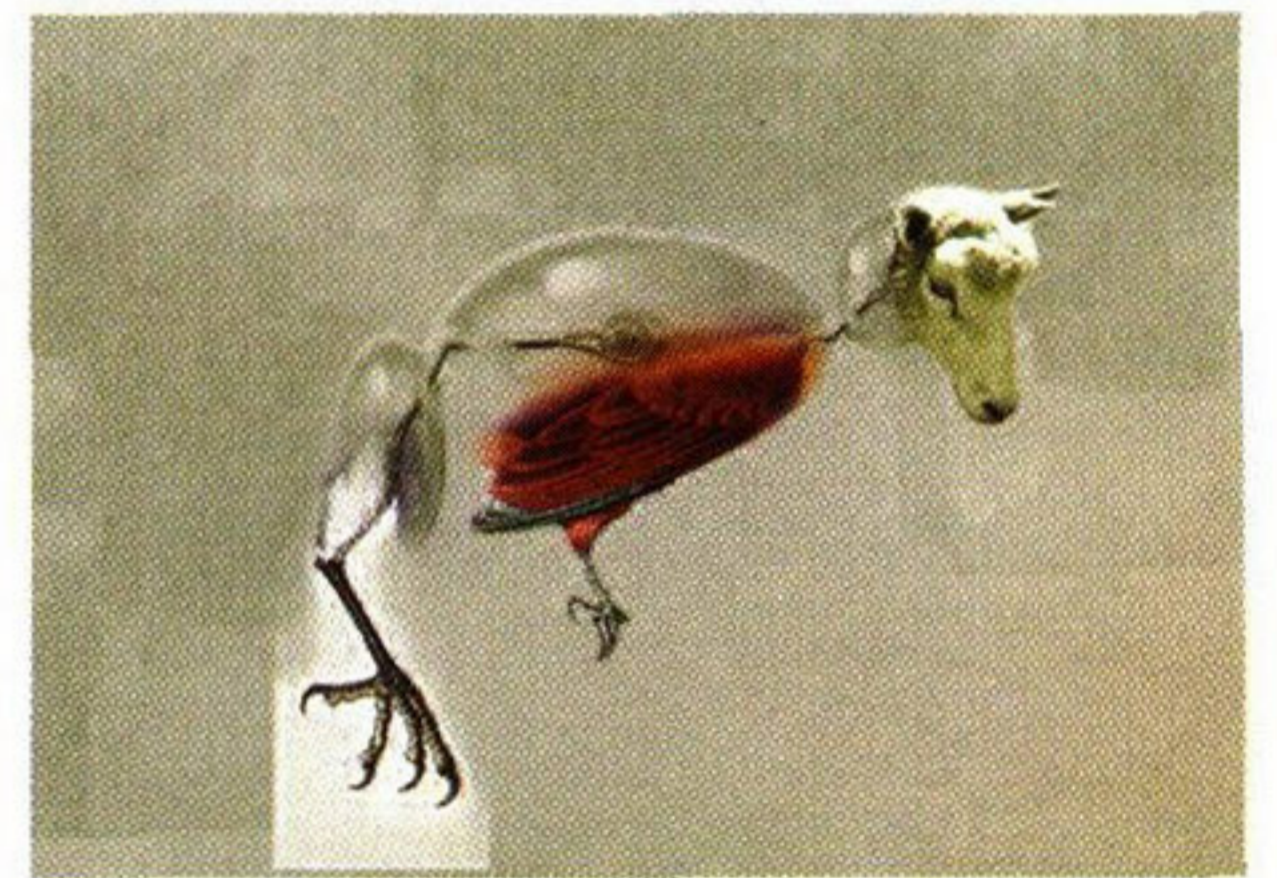
Making sense of an enhancement culture via this notion is critical, as it presents a future where humanity is not made more homogenous by human enhancements, but where variety becomes extraordinarily visible. Indeed, we might compare such a future to how we perceive the way in which we individualize clothing and other accessories today. Thus, the problem with today’s enhancement culture is not that there are too many ways to alter ourselves, but that there are too few. The analogy to fashion is all the more persuasive, because it takes into account how consumers are constrained by what is available on the market. Consequently, we are compelled to interrogate these conditions to ensure that the market optimizes choice.

The accumulation of biocultural capital is the principal justification for pursuing human enhancements. Coming to terms with this desire ensures that institutions of scientific and health governance will limit their ambitions to temper the pursuit of enhancement to providing good information, though they are obliged to undertake such work. Instead, science should be concerned with more effectively locating scientific decisionmaking processes within the public domain, to ensure that they are part of the cultural shifts

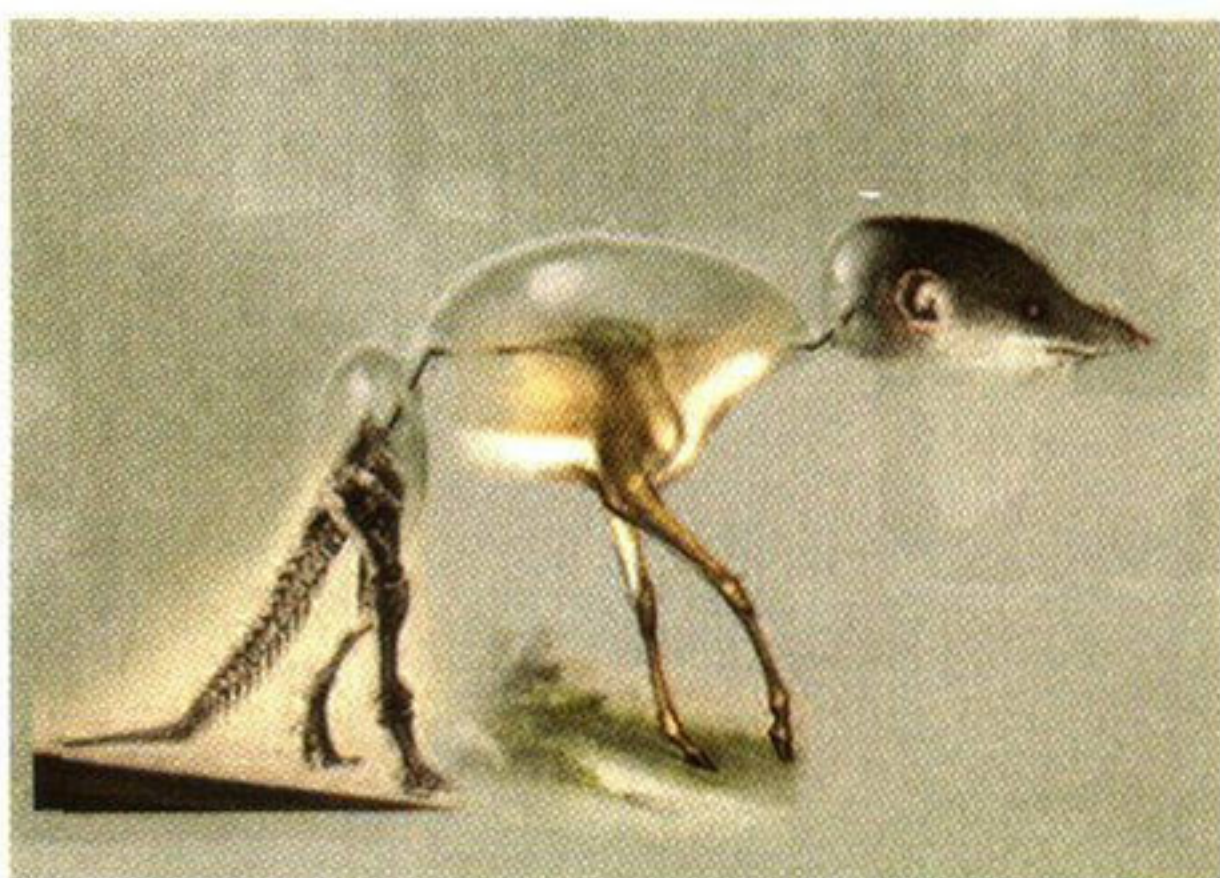
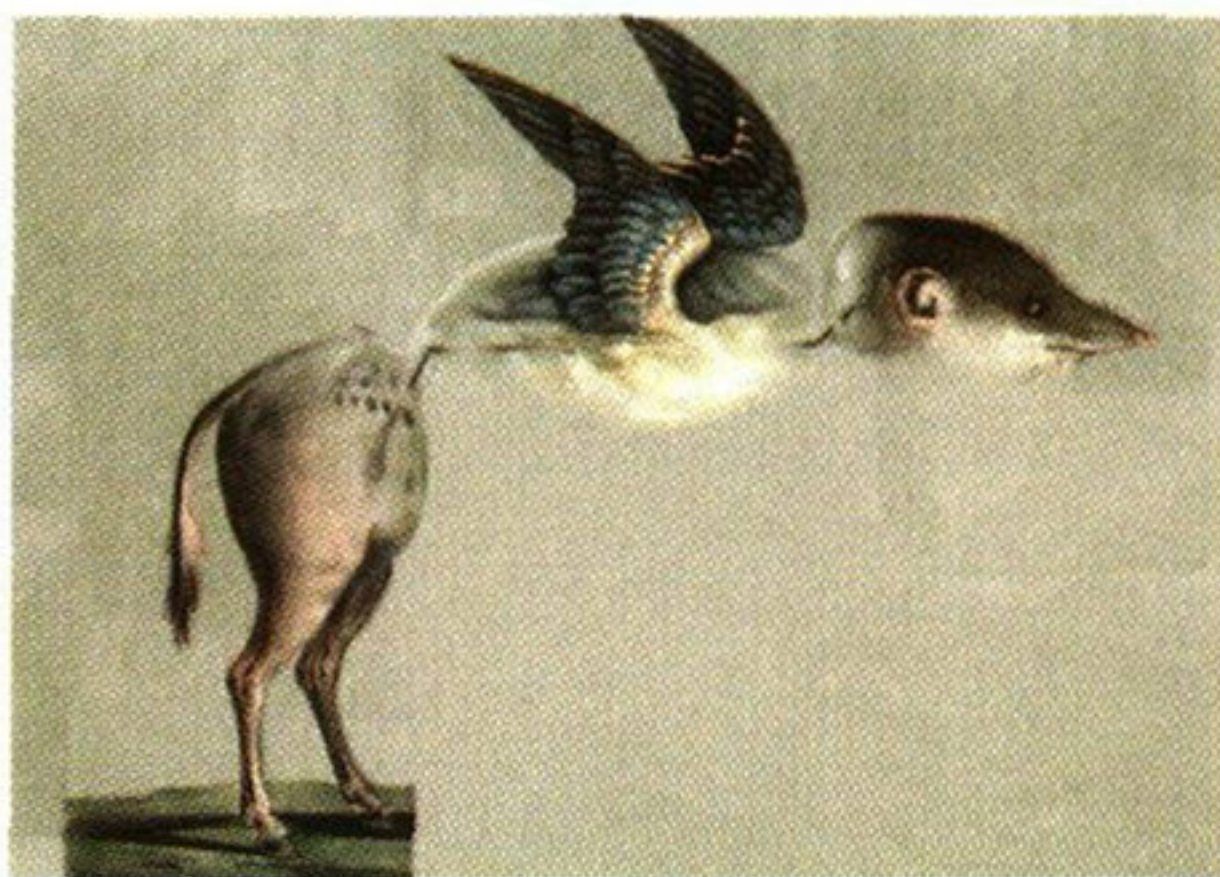
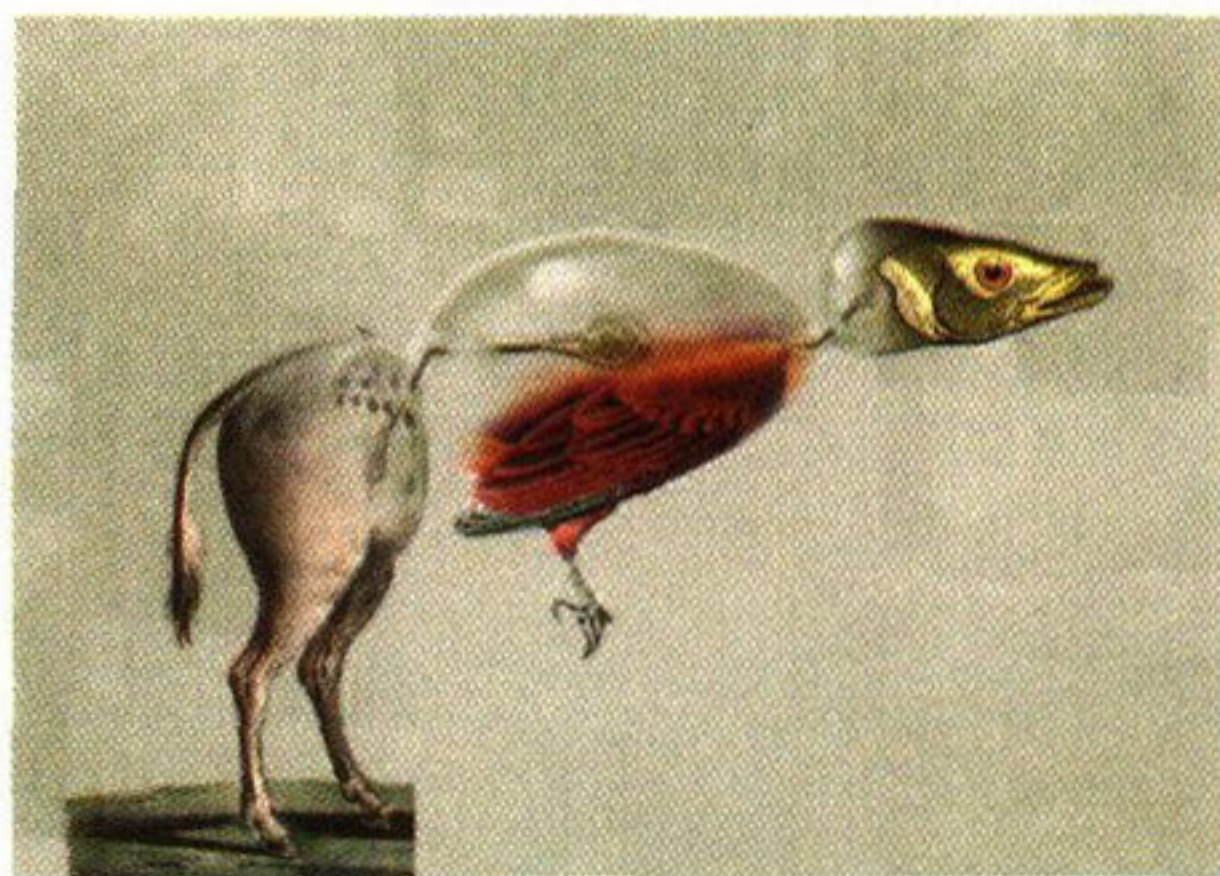




EVA SUTTON, *Hybrids* interactive installation, Museo Tridentino Di Scienze Naturali, Trento, Italy, 2007.







that occur around their industries.

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## A necessary critique of science

Michael M. Crow's "The Challenge for the Obama Administration Science Team" (*Issues*, Spring 2009) doesn't call spades digging implements. It's unexpected to find a U.S. university president acknowledging and deploring the system of semi-isolated, discipline-oriented research in our universities. It's also noteworthy to find his critique in a publication sponsored by the National Academies of Science and Engineering. Crow's article may signal recognition that longstanding complaints about flaws in U.S. science policy can no longer be ignored at this time of national crisis. Even Daniel S. Greenberg, dean of U.S. science policy observers and a man fiercely devoted to the independence of scientific inquiry, has noted that public support without external oversight or responsibilities has not been healthy for U.S. science.

In a just-released five-year study of the origin of U.S. conflicts over environmental and energy policy, I identified additional and continuing adverse effects of the manner in which federal support for basic research was introduced to U.S. academia after World War II. Although the cost of the National Science Foundation and other federal research outlays was relatively modest, at least initially, the prestige associated with the basic research awards caused discipline-oriented, peer-reviewed publications to become the basis of academic appointments, promotion, and tenure. The quality of research products was generally high, but applied science, engineering, and larger soci-

etal issues became relegated to second-class status and interest. University curricula and the career choices of gifted scientists were affected. Scientific leaders failed to oppose the wholesale abandonment of mandatory science and math courses in secondary schools in the 1960s, so long as university science departments got their quota of student talent. Additional adverse direct or indirect effects of the new paradigm included initial neglect of national environmental policy and impacts on federal science and regulatory agencies and industry.

Finally, the entropic fragmentation of conceptual approaches to complex problems seems to contribute to the willingness of scientists and other leaders to ignore insights or ideas outside their preferred associations. This may complicate the task of gaining holistic understanding of major issues in society for citizens as well as scientists.

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## Squaring biofuels with food

In their discussion of land-use issues pertaining to biofuels ("In Defense of Biofuels, Done Right," *Issues*, Spring 2009) Keith Kline, Virginia H. Dale, Russell Lee, and Paul Leiby highlight results from a recent interagency assessment [the Biomass Research and Development Initiative (BRDI), 2008] based on analyses of current land use and U.S. Department of Agriculture baseline projections. The BRDI study finds that anticipated U.S. demand for food and feed, including exports, and the feedstock required to produce the 36 billion gallons of biofuels mandated