sents the sister taxon to the ungulates, which should serve as the most appropriate outgroup to properly root the tree. This dilemma is no less profound for the morphological data than it is for the molecular data.

John E. Heyning
Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, CA 90007, USA.

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Edison's Laboratory

The issues raised by John J. Gilman in his 15 January letter (*Science*'s Compass, p. 327) prompt me to respond both to his remarks and to Bettyann Holtzmann Kevles's review (*Science*'s Compass, 11 Dec., p. 1997) of my book, *Edison: A Life of Invention* (*1*). The book's arguments are actually much closer to those suggested by Gilman than those represented in the review. In her effort to distill a 500-page book into a short review, Kevles chooses language that oversimplifies my analysis of Edison's laboratories and research methods.

I would never use the term "overgrown workshop" to describe Edison's laboratories. In fact, I discuss at some length how he combined the tradition of machine shop invention with laboratory research to construct a new institution—the industrial research laboratory. In addition, I point out how the first of these laboratories at Menlo Park was seen as new by his contemporaries, who then tried to emulate his example. I also note that, during the last quarter of the 19th century, Edison had the finest and best-equipped private research laboratories in the United States. Moreover, Edison pioneered the use of research teams that combined skilled mechanics, able to construct and modify new technologies, with laboratory researchers using the best electrical and chemical apparatus available to investigate and test the materials and mechanical and electrical elements that made up these devices.

The research that went on in Edison's laboratories was certainly much more than mere tinkering, another term I would never use to describe Edison's work. It may be that Kevles and I disagree over the extent to which Edison's research, which was largely empirical, represents research rather than tinkering. But I would argue that much scientific and technological research is primarily empirical. Throughout the book, I discuss at length how the research undertaken by Edison both drew on the best scientific knowledge of the day and often moved beyond that knowledge to provide new understanding of materials or electromagnetic effects that proved essential to his inventive work. Moreover, from 1874 until near the end of his career, Edison periodically undertook basic research designed to discover unknown natural forces; while these might ultimately be useful to the development of new technologies, the creation of new knowledge was the primary goal. The laboratory records that I draw on extensively show us a very different Edison from the commonly held image of a self-taught tinkerer.

Paul Israel
Managing Editor, Book Edition, *Thomas A. Edison Papers*, Rutgers, The State University of New Jersey, New Brunswick, NJ 08901–1108, USA. E-mail: pisrael@rci.rutgers. edu

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Response

It seems to me that it is a matter of tone that disturbs Israel. It is true that the phrases "overgrown workshop" and "tinkering" are mine, not his. But I did not omit to mention his attention to Edison's interest in and understanding of the basic science of his day. I certainly did not intend to denigrate Edison. I suggest that readers examine this very important biography for themselves and then decide if my review distorted or demeaned Edison's character or contributions.

Bettyann Holtzmann Kevles
575 La Loma Road, Pasadena, CA 91105, USA. E-mail: Bkevles@aol.com

Journal Prices

As most of us know, the price of commercial scientific journals (R. Johnson, Letters, *Science*'s Compass, 1 Jan., p. 33; D. L. Roth, *ibid.*; P. T. Shepard, *ibid.*, 27 Nov., p. 1643; H. K. Lee, *ibid.*; D. Malakoff, News of the Week, 30 Oct., p. 853) has increased at about three to four times the consumer price index (CPI). Even allowing that the CPI is not the correct measure of costs in academia and even allowing for an increase in the number of journal pages published, this is an outlandish rate of increase. Most academic libraries cannot keep up with these price increases and, as a result, the number of subscribers for most commercial journals has decreased over the years. This "wastage" causes the commercial publishers to increase their subscription prices even faster to keep their revenues level. Because the users of these journals (the scientists who publish in them) are not the

ones paying for them, the normal law of supply and demand is not operative. In other words, there is no natural feedback system to keep the prices in line. Journals published by societies have not had these outlandish price increases, in part because they are not driven by a need for increasing profits and because there is some feedback from the society members.

What can we as scientists do about this problem? First, consider the circulation of a journal before publishing in it. With a few exceptions, the higher a journal's subscription price, the fewer libraries will have it. Why send a paper that you have worked on for months or years to a journal that few people will ever see? (Of course, we know that the answer to this question is that commercial journals tend to have more lax acceptance standards.) Second, the more senior among us can refuse to serve as editors and on the editorial boards of expensive, commercial journals. The irony here is that we often serve in these positions so that we can get a free copy of the journal, one that our library cannot otherwise afford.

Ronald A. Hites
School of Public and Environmental Affairs, Indiana University, Bloomington, IN 47405, USA. E-mail: hitesr@indiana.edu

Breast Implant Safety

When reading Jocelyn Kaiser's article "Scientific panel clears breast implants" (News of the Week, 11 Dec., p. 1963), one should not confuse the failure to accumulate sufficient human evidence that silicone breast implants damage the health of some people with evidence that no such link, in fact, exists. While the court-appointed science panel reviewed human epidemiologic studies and found "no association" between implants and connective tissue or immune system disease, this finding does not mean that silicone breast implants have been given a "clean bill of health." Rather, this conclusion reflects the serious challenges of obtaining valid human data in these circumstances, where all exposed persons have not been followed medically throughout their lifetimes and the nature of their exposures has not been clearly charted.

As the scientific study of patterns of health in populations, epidemiology remains a blunt instrument best suited to confirming relatively large and easily characterized past risks that affect sizable populations over time, such as those linked with cigarette smoking and poor health. When it comes to assessing risks of relatively rare diseases that may be tied with recent exposures and affect relatively small numbers of people, epidemiology is seldom definitive.

Many of the critics of the silicone breast implant legal settlements ignore a vast literature of medical studies of in vitro immunoassays, human cell cultures, and experimental animals published in leading medical journals which document a host of complex immune system effects linked with silicone exposure. When it comes to developing new drugs, experimental studies are the very foundation of modern pharmaceuticals. By what logic are these same studies not relevant to predicting human impacts?

The court-appointed science panel is narrowly correct about the failure to find statistically significant results in human studies of silicone breast implants at this time. However, sound health policy requires using the full complement of experimental and human evidence in devising strategies to protect health.

Devra Lee Davis
Health, Environment and Development Program, World Resources Institutes, Washington, DC 20006, USA, and Strang Cancer Prevention Center, Cornell Medical School, New York, NY 10021, USA

Robert F. Garry
Department of Microbiology and Immunology, Tulane University School of Medicine, New Orleans, LA 70112, USA. E-mail: rgarry@tmcpop.tmc.tulane.edu