

Dr. Kaufman refers. From the first word in the title and at several important points within the article, the authors specify very clearly the exceptional attributes of this single patient that led to the unfortunate outcome after exposure to a very common anesthetic agent. The further development of powerful DNA methods in recent years made it possible to understand the cause of death in this patient and thereby to shed further light on important, incompletely understood pathophysiological mechanisms.

Geneticists sometimes say, “Treasure your exceptions,” referring to the opportunities we encounter among patients for furthering our understanding

of important normal and abnormal human functions. This patient was assuredly an exception — indeed, a very rare one. Careful reading of the report and the Perspective article should allow readers to interpret correctly the relevance of this case report to the neurochemical functions of methionine, rather than making an inappropriate generalization about the risks posed by nitrous oxide, an anesthetic agent with a long and very positive record of safety.

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The Vulture and Stem Cells

TO THE EDITOR: Rosenthal (July 17 issue)¹ begins her article by considering the myth of Prometheus. She says that a vulture preyed daily on his self-renewing liver. Indeed, Greek mythology tells us that a bird ate Prometheus’s liver, but older sources allude to an eagle instead of a vulture^{2,3} (Fig. 1). This is not a trivial point, because vultures are scavengers, whereas eagles are birds of prey. Vultures would never eat living animals. This cultural imprecision might seem unimportant, but terminology is key with respect to the issue of the “stem-cell promise.” Semantic differences between terms such as “nuclear transfer” and “therapeutic cloning” are very important.

To continue the theme of Greek mythology, we suggest the myth of Phaethon. Helios (the Sun) drove his scalding carriage through the skies every day. Having made insistent requests, Phaethon, Helios’s young and inexperienced son, managed to drive the chariot for a day, but he could not stop the runaway horses, whose path threatened to burn the Earth. Annoyed, Zeus struck Phaethon with a lightning bolt. Since adult stem cells appear to show clinical safety and feasibility,^{4,5} it should be noted that other sources of cell therapy could be dangerous,⁶ at least until we have wider knowledge about how to control them.

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Figure 1. Prometheus Attacked by Zeus’s Eagle.

Attributed to the Arkesilas Painter, circa 555 B.C.

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1. Rosenthal N. Prometheus’s vulture and the stem-cell promise. *N Engl J Med* 2003;349:267-74.
2. Theogony [lines 520-525]. In: Hesiod. *Homeric hymns: epic cycle: Homeric*. Loeb classical library. Series no. 57. Evelyn-White HG, trans. Cambridge, Mass.: Harvard University Press, 1969.
3. Prometheus bound [lines 1020-1025]. In: Aeschylus. Vol. 1. *Suppliant maidens: Persians: Prometheus: Seven against Thebes*. Loeb classical library. Series no. 145. Smyth HW, trans. Cambridge, Mass.: Harvard University Press, 1969.
4. Orlic D. Adult bone marrow stem cells regenerate myocardium in ischemic heart disease. *Ann NY Acad Sci* 2003;996:152-7.
5. Garcia-Olmo D, Garcia-Arranz M, Garcia LG, et al. Autologous stem cell transplantation for treatment of rectovaginal fistula in perianal Crohn’s disease: a new cell-based therapy. *Int J Colorectal Dis* 2003;18:451-4.
6. Hochedlinger K, Jaenisch R. Nuclear transplantation, embryonic stem cells, and the potential for cell therapy. *N Engl J Med* 2003; 349:275-86.

DR. ROSENTHAL REPLIES: I commend my colleagues for their careful perusal of the ancient literature, having correctly identified two sources of the Greek legend where an eagle, probably a symbol of Zeus himself, was sent to torture the Titan Prometheus. As noted by other scholars,¹ the Promethean tale resembles one described in Homer's *Odyssey*, in which Tityos is tormented by two vultures and may have been the original victim of this punishment.

An earlier legend holds precedence in the Caucasus, where earthquakes were allegedly caused by the struggles of a fierce giant, fettered in a mountain cave for his various impieties while a vulture pecked intermittently at his bowels.² Perhaps it was this ancient version to which Bulfinch's *The Age of Fable* alludes in describing Prometheus "chained to a rock on Mount Caucasus, where a vulture preyed on his liver."³ Other literary figures, including Byron, have also described the vulture of Promethean legend.⁴

As for the argument that vultures never eat live flesh, this is not strictly true. They are omnivorous, feeding chiefly on carrion because they have rela-

tively weak beaks and lack the strength of other birds of prey. They rarely attack live prey unless it is rendered helpless. One might argue that Prometheus was defenseless against the attacks of emboldened raptors, but the true ornithologic identity of his devourer remains enshrouded in the mists of myth. Let us hope that as scientists we leave less indeterminate the documentation of the illusive stem cell's true identity.

(I am indebted to Professor Brian Bothwick, Department of Classics and Ancient History, University of Western Australia, for his invaluable tutelage and for the use of his excellent library.)

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1. Hesiod. *Theogony*. West ML, trans. Oxford, England: Clarendon Press, 1966.
2. Olrik A. Ragnarök. Ranisch W, trans. Berlin, Germany: W. de Gruyter, 1922.
3. Bulfinch T. *The age of fable: or stories of gods and heroes*. Boston: Charles E. Brown, 1855.
4. Prometheus. In: Byron GG. *Works*. London: John Murray, 1832.

Stem Cells

TO THE EDITOR: Regarding your editorial in the July 17 issue,¹ I would like to extend my compliments and appreciation to you and your editorial staff for making the publication of stem-cell research a priority. My mother has been fighting Parkinson's disease for almost 30 years, and although upcoming research may do little, if anything, to help her at this point, it has lifted the spirits of our family tremendously to know that promising research will get the attention it deserves and will perhaps help others.

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1. Drazen JM. Legislative myopia on stem cells. *N Engl J Med* 2003; 349:300.

TO THE EDITOR: You accuse the U.S. House of Representatives of "legislative myopia" in their vote to ban research on medical treatments derived from embryonic stem cells. It might be, instead, that many legislators and the people they represent are being prudent and thoughtful in arriving at their assessment that this research should be banned. Both reproductive cloning and therapeutic cloning produce a human embryo. Even at this single-cell stage,

the human embryo has a human genetic code and is a living human being. The therapeutic clone is then destroyed so that its stem cells may be harvested for research.

The opposition to therapeutic cloning is not a legislative gaffe but the result of a deeply held belief in the personhood of the human embryo and the intrinsic value of every being of human origin. The goal of finding treatments for conditions that are incurable is a worthy one, but not if the means to achieving this goal is the production, and then the destruction, of human embryos. I hope the editors of the *Journal* will accept moral views contrary to their own.

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DR. DRAZEN REPLIES: The letters we have received about somatic-cell nuclear transfer exemplify the differing opinions about the ethical aspects of this procedure. There is no one answer that will satisfy everyone. Our position is that the use of somatic-cell nuclear transfer to create embryonic stem cells for therapeutic purposes is ethically justifiable. Thus, the editors plan to judge research using this form