political statement about "genetic elitism" by openly accepting donors from traditionally disenfranchised groups.

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On reading Marshall's article "Whose genome is it, anyway?," it occurred to me that this entire issue could be handled in an entirely different manner. Why not auction off the right to sequence chromosomes or parts of chromosomes? The highest bidder would get his or her DNA sequenced. This would provide additional funding, diversity, and the question of consent, and anonymity would be obsolete. Admittedly, it would lead to an elitist genome being sequenced first—the genome of the financially potent. But didn't certain qualities determine who was the first man to walk on the moon? The Human Genome Project would make it into history books, and surely many people would like to have their names (DNA) associated with it.

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Evolution Teaching

In Karen Schmidt's News & Comment article "Creationists evolve new strategy" (26 July, p. 420), Eugenie Scott of the National Center for Science Education is said to discourage individual scientists from debating creationists. Schmidt further suggests that scientists who have engaged in such debates say Scott is right. I have had several formal debates with creationists, I have experienced that feeling of having "been in a boxing match," and I think Scott is flat wrong.

No evolutionist should ever plan on converting the faithful to our view of the planet's history in a debate or even in a semester-long class. True believers are not swayed by logical interpretations of loads of evidence. The pious, however, are not the ones for whom we present our counterarguments to creationists' interpretations. We are there for those who would like to learn how to deal with that purveyor of creationism on the doorstep, that biblical literalist in the cafeteria, that roommate who believes in Noah's ark, or even that schoolteacher who presents "both models" and lets students choose the preferred alternative.

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Paul R. Gross (Letters, 6 Sept., p. 1321) is quite right: not only is it not "demeaning" for scientists to enter public debates to question claims about "facts" (his quotes) offered by creationists, but it is usually their duty to do so, and such interventions are not without their effects. What, however, *is* demeaning is for scientists to treat their disputants with contempt and derision and to try to counter what scientists may see as misconceived parodies of scholarship with "a willful strategy of distortion and demonization" (*1*) of their own, abandoning all pretense of trust and respect among academic colleagues. To do so is to squander one priceless asset of scientific practice, namely, eschewing ad hominem argument and engaging in open, fair, honest, and well-informed disputation. To behave otherwise is to demean (and will eventually destroy) the very science and reason that we all are so anxious to conserve and extend. Whom the cap fits. . . .

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Judy Harvey writes (Letters, 6 Sept., p. 1321) that after significant experimental support is gathered, a hypothesis becomes a theory. This much is true. She then writes that if, after further testing, the theory "proves true in all circumstances, then it becomes a law." This should be restated. A law is a concise verbal or mathematical statement of a relationship between experimentally observed parameters that is always the same under the same conditions. A theory does not become a law; rather, a theory explains a pre-existing law and the body of facts upon which that law is based.

Hypotheses explain laws, and well-tested, corroborated hypotheses become theories. Harvey states, "there is a Law of Gravity and the Laws of Thermodynamics, but there is not a Law of Evolution. . . ." This mixes apples with oranges. The laws of gravity and thermodynamics are mathematical equations. There is no Law of Evolution because the facts explained by the theory of evolution cannot for the most part be pre-

sented as a law, in a mathematical format. This is not a flaw of the theory, but rather an idiosyncrasy of the field.

A theory that cannot explain significant data sets published in the peer-reviewed literature inevitably falls out of favor and is replaced by a better theory. So far, evolution has repeatedly, since the mid-19th century, stood the test of time. Creationism, which is not a credible theory, should not be taught in our classrooms. Evolution must be taught, along with the data that both support and contradict the theory. A robust theory has nothing to fear from contradictory data; on the contrary, explaining confusing data strengthens a theory and leads to advances in science. Giving students all the facts will allow them to see the excitement and power of the scientific method.

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German Universities

Wolfgang Zeman writes (Letters, 23 Aug., p. 1029) about German universities having "large sums of public funds to provide [to] the students," which is "a hefty subsistence." However, only a small group of students in Germany obtains this help. The great majority see nothing of these funds because of the severe criteria one must meet to receive them. The long period that German students are in the university is probably because many must work while studying. Also, Germany does not have more students than other countries; the percentage of students in the population is about the same as elsewhere. The "egalitarian concept" is right, because everyone has the right to study. So it was progress when tuitions were abolished.

Zeman also states that "medical schools were opened to anybody," but since ancient times every German student has needed to pass the *Abitur* or a comparable exam to enter any university.

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Stuart Brody (Letters, 23 Aug., p. 1029) incorrectly implies that German scientific faculties from 1933 until after World War II were made up mostly of "lesser talents" or opportunists. It is correct, however, that some formerly Nazi professors were wrongly put in office under the post–World War II government of Konrad Adenauer. In fact, most scientific faculties at most German universities seem to have tried to protect themselves and their subject matter from political interference as much as possible. The ability to do this, and success at it, varied. It was probably most difficult in biological sciences, because the Nazis believed in a biologistic reductionism. As to whether good science was done, although German science was clearly substantially and severely weakened by the expulsions, there seems to have been a continuity of scientific tradition among those scientists remaining. The prejudice that only under democratic- republican forms of government can good science be done has a long and honorable heritage going back at least to David Hume. But it is that prejudice which led politicians in the United States to believe in 1945 that they could keep the secrets of atomic weaponry from the Russians.

Finally, Adolf Hitler was never "installed by elections" or elected in any way. In fact, in the last election (6 November 1932) before Hitler became chancellor (30 January 1933), the Nazi party actually lost votes and seats in parliament from their previous high the preceding July. While, after the November elections, they were the largest party in the Reichstag, the communists and the social democrats between them controlled far more votes. Hitler was appointed chancellor by the aged president Paul von Hindenburg, influenced by his son Oskar and by former chancellor Franz von Papen. In March 1933, after being in power for 6 weeks, Hitler engineered another election, and even then the Nazi party failed to obtain more than 50% of the vote.

In making historical points, scientists need to treat historical facts with as much respect as they give to scientific facts.

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Letters to the Editor

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