Rhesus macaques suitable for AIDS and other research are in short supply, but it is suggested that "[o]nly when we can define our animal resources through genetic testing will we be able to effectively manage our rhesus breeding colonies to meet...research needs...." A member of the U.S. Department of Education's panel that reviewed and selected math curriculum material for endorsement discusses the selection process and comments that a variety of materials and approaches should be used because children learn in different ways. And some of the difficult issues inherent in clinical research are examined: "Our efforts to ensure ethical conduct of experimentation with humans need to catch up with the incredible advances in science."

Managing the Rhesus Supply

The News Focus article "Vaccine studies stymied by shortage of animals" by Jon Cohen (11 Feb., p. 959) highlights the problem of availability of Indian-origin rhesus macaques in AIDS research. A shortage of rhesus macaques is a problem in other disciplines as well, a point Cohen mentions only briefly. To develop effective strategies for meeting this need, the problem must be viewed at a national level, not as the problem of a single institute.

AIDS and other research is hard hit by the rhesus shortage.

CREDIT: R. DODSWORTH/WISCONSIN REGIONAL PRIMATE RESEARCH CENTER

Similarly, the population of rhesus macaques in the United States must be viewed as a whole, rather than as subpopulations of animals. The perception that rhesus macaques of Chinese origin are not suitable for AIDS research is, to our knowledge, based on a single peer-reviewed paper and anecdotal accounts from various research labs. There are opposing anecdotal accounts indicating that these animals can indeed be used for AIDS research. Although there may be variations in different populations of rhesus macaques, there is insufficient scientific evidence to eliminate a portion of the breeding population in the United States. The species, *Macaca mulatta*, has a wide range, extending over millions of square kilometers in India and Asia. To efficiently and wisely manage the nonhuman primate resource in the United States, we must define these animals not only by geographic origin but by genetic characteristics as well.

The need in the late 1980s for specific pathogen-free rhesus macaques was met by the National Center for Research Resources' (NCRR's) support of programs to develop tests for screening rhesus breeding populations for undesirable viruses. Now is the time for NCRR to provide similar support for the development of genetic screening tools for rhesus macaques. Only when we can define our animal resources through genetic testing will we be able to effectively manage our rhesus breeding colonies to meet the research needs of U.S. investigators.

Jeffrey A. Roberts*
California Regional Primate Research Center, University of California, Davis, CA 95616, USA. E-mail: jaroberts@ucdavis.edu

David Glenn Smith
National Institutes of Health Genetics Typing Laboratories, Department of Anthropology, California Regional Primate Research Center, University of California, Davis, CA 95616, USA

Andrew Hendrickx†
California Regional Primate Research Center, and Department of Anatomy, School of Medicine, University of California, Davis, CA 95616, USA

*Assistant director and †director of the California Regional Primate Research Center

From the "Math Wars" Front

A prime example of federal meddling in local elementary and secondary education is well illustrated in the News Focus article "Packard heir signs up for national 'math wars'" by Jeffrey Mervis (11 Feb., p. 956). A Republican Congress mandated that the U.S. Department of Education establish a panel of experts to inform school districts about exemplary and promising math curriculum materials. When the panel was assembled, many members indicated the no-win situation and questioned whether the government should be getting involved to such an extent. Told that Congress wanted this done, the panel members, over a period of a year, worked on establishing criteria for materials to be classified as "exemplary" or "promising." Once the criteria were established, some materials were used for a trial run, and modifications were made on the basis of those trials. A call then went out asking for voluntary submission of materials. These materials, including research on student performance, were then evaluated by the panel according to the criteria.

Most of the curriculum materials that made the list were developed through grants, from either the National Science Foundation or other foundations. Their original development proposals had a strong research component built in, and materials were tested, revised, and tested again. These projects had longitudinal data of student performance, a major criterion of the "exemplary" classification. This is not to say that other materials were not considered of high quality. Many were, but they did not have the data of student performance that were required. Unlike the ratings by Project 2061 (a science education reform initiative of the American Association for the Advancement of Science, publisher of *Science*), there was no attempt to indicate anything about the nonqualifiers; that was not part of the panel's mission.

The panel members did the best job they could under the edicts of the legislation. Every person there wanted the best possible mathematics education for all children. How these ratings are used by the school districts is obviously their choice. What does not appear to be obvious to the more than 200 academics who took out an ad in the 18 November *Washington Post* urging the Department of Education to withdraw its endorsement of 10 new math texts for elementary and secondary school students, and to many school districts, is that children learn in different ways. The materials and strategies that work with one student may not work with others. For all students to meet the same high standards, standards that are locally adopted, the best solution is to put a variety of quality materials into the hands of mathematically competent teachers who understand that they must use this variety of materials and a variety of approaches to meet the needs of all their students. No federal panel or legislative body, however well meaning, can substitute their judgment for the best judgment of the school district and the teacher in the classroom. All the panel can say is, "This is how it looks to us. Do with it as you will."

Jack Price*
Department of Mathematics, California State Polytechnic University, Pomona, CA 91768, USA

*Member of the Department of Education's panel that assessed the math curriculum material

Statistics of Ancestral Roots

My comment reported in Constance Holden's News Focus article "Were Spaniards among the first Americans?" (19 Nov., p. 1467) was a general, not a specific, comment on Walter Neves' interpretation of the hominid skeleton Luzia. Nevertheless, Neves' comment (*Science*'s Compass, Letters, 11 Feb., p. 974) that he and his colleagues have "almost 15 specimens dated between 8500 and 11,500 years ago" is no contradiction of my statement in Holden's article that variation within (and, I should have said, intergradation between) racial groups today is so great that it is impossible to identify an individual's roots on the basis of sparse skeletal evidence. Multivariate statistics won't offset small sample sizes. Whether analysis is based on 1, or 15, or 30 individuals spread out over a 3000-year period, any attempt to assign them to a race is spurious: they do not constitute a population, and there is not enough evidence to point conclusively to any original homeland or to affinities (other than coincidental ones) between them and modern Australians or Africans.

L. G. Freeman
Department of Anthropology, University of Chicago, Chicago, IL 60637, USA, and Instituto para Investigaciones Prehistóricas, Avenida, De Pontejos, 9, Santander 39005, Spain. E-mail: l-freeman@uchicago.edu

A Question of Permanence

Scientific literature has a definite structure, a connectivity matrix consisting of citations from one article to previous articles. This structure was recognized by *Science* 45 years ago (*1*). In fact, *Science* took a leadership role by publishing several articles dealing with the literature (*2–4*). Publishers of online journals, however, do not seem to appreciate this inherent structure.

In Floyd E. Bloom's Editorial "Lunch selections expanding" (4 Feb., p. 801), he refers to the *British Medical Journal* policy of allowing authors to make changes in their online articles. Although this policy may be innocuous in itself, in the same category as meeting presentations, it would be disastrous to the literature structure if these ephemeral articles are allowed to be cited. The inherent value of paper journals is that they cannot be changed once published. Any changes must be made in a subsequent publication. That way, an author citing an article can be assured that the information referred to in it does indeed exist exactly as it was read. If articles are ongoing works in progress, the utility of the published literature breaks down.

Articles may be cited many decades after they have been published (*5*). Meta-analyses are based on the permanence of their underlying articles. Current concern over such matters as peer review and format pale into insignificance if the basic integrity of the literature structure is lost.

Science has advanced because of its literature structure. Online journals certainly have many advantages over paper, but they must also preserve the basic advantage of paper—its immutability. Citation networks differ from hyperlinks, a point scientific publishers must keep in mind. I'm concerned that students today are getting the impression that if information is not available online, it doesn't exist. On the other hand, we old-timers think that if something is not published on pa-