# Letters

## Recombinant DNA Research: Proposed Revised Guidelines

Secretary of Health, Education, and Welfare Joseph A. Califano, Jr., has approved release by the National Institutes of Health (NIH) of Proposed Revised Guidelines for recombinant DNA research funded by the NIH. The following documents were published on 28 July in the *Federal Register* for 60 days of public comment: (i) a Decision of the Director, NIH, to publish revised NIH guidelines for research involving recombinant DNA molecules; (ii) the Proposed Revised Guidelines; and (iii) an Environmental Impact Assessment of the proposed action.

Before the revised guidelines become effective, the Secretary will have all public comments reviewed by a high-level HEW committee which will be chaired by the department's General Counsel. The committee's review will also include a public hearing to be held on 15 September in the Washington, D.C., area. Within 45 days after the comment period, final guidelines will be issued with a notice in the *Federal Register*.

The events leading to the proposed revisions are described in the "Introduction and Overview" to the Decision and in the "Foreword" to the Assessment. The Decision document and the Assessment take into account all the issues raised at the public hearing of the Advisory Committee to the Director, NIH, held in December 1977 and the correspondence received on this subject before and after the public hearing. The 60-day period for public comment on these documents and the public hearing this fall provide further opportunity for public participation before release of the revised guidelines.

Comments and inquiries concerning the proposed revision of the guidelines are invited during a 60-day period beginning 28 July. Correspondence should be addressed to the Director, NIH, Building 1, Room 124, 9000 Rockville Pike, Bethesda, Maryland 20014.

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## Human Rights in Argentina

José Rivarola and Julio V. Uriburu write (Letters, 21 July, p. 211) of the troubled feelings of the National Academy of Medicine of Buenos Aires over "the false and malicious reports spread abroad by the press misrepresenting the social situation in our country." These rumors, it seems, might be deterring some members of the international scientific community from attending the International Cancer Congress to be held in Buenos Aires next October.

The nature of the rumors needs to be noted: "the general climate of public insecurity, the breaking of human rights laws, the persecution of scientists, and so forth," in Argentina. Rivarola and Uriburu mention four sets of "facts" to counter these rumors. The final one states, "At present, the universities and research institutes are places of quiet and fruitful work, in contrast to the agitation, the activism, and the persecution of professors and scientists that were so frequent before March 1976."

It is entirely possible that freedom from earlier persecution and violation of human rights now makes fruitful work a reality in the medical research activities of Argentina's universities and institutes. There seems to be room to doubt, however, that this freedom applies to physicians and other applied scientists in the country. A few days before the arrival of the 21 July issue of *Science*, a communication from Amnesty International described the disappearance on 31 May 1978 in Buenos Aires of a well-known psychiatrist, Francisco Berdichevsky, a patient of his, and one of the doctor's friends who had begun looking for him. There is concern for the physical safety of the three, and for their legal status.

About a month earlier another Amnesty International communication took up the detention and disappearance of a young lawyer and psychology student—Alberto Jorge Endrell—on 19 May 1978.

The choice of declining to attend scientific meetings in countries with a record of violating the United Nations Universal Declaration of Human Rights is, naturally, a personal one. Nevertheless, members of the international scientific community who are disinclined to attend the October cancer congress because of doubts that the U.N. declaration is being conscientiously observed in Argentina may not be fully reassured by the communication from the National Academy of Medicine in Buenos Aires.

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## The Image on the Shroud

The interesting article about the shroud of Turin (News and Comment, 21 July, p. 235) does not mention one possible origin of the image, namely, transfer from a preexisting painting rather than from an actual body. It seems to have been established that the shroud itself is not a painting from which most of the pigment has been removed, but could it not be a piece of linen that had long lain in contact with a flat painting on another surface? The appearance does not suggest transfer from a complex object in three dimensions, for the details do not properly relate to points of contact and reversals of curvature. Moreover, a close wrap around would show ears and hair in lateral view, not frontal. However, a piece of linen wrapped around a flat painting to protect it during storage or emergency would take up an impression from loose pigment particles, from water-soluble dyes carried in dampness by capillarity, and from slightly volatile components of the resins and other organic materials commonly used by painters as vehicles and binders. Even if these substances were adsorbed in amounts too minute to be immediately visible, they would locally modify the darkening of the fabric with age. Such transfer effects can be seen in many old books that contain color illustrations.

A scientist using sophisticated modern instruments in the study of ancient objects must maintain close, continuing interaction with the broader expertise of other scholars. (This is why I feel uneasy about the growing use of the term "archaeometry" to describe this type of study, for it should be so much more than measurement).

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## Human Cloning: An Apathetic View

Doomsday predictions of the outcomes of scientific research tend to overlook the social variables that intervene

between the availability of a new technology and its widespread adoption. Projections of the impact of novel technologies may therefore be naive and simplistic. For example, the advent of clonal reproduction of life forms almost immediately raised spectres of the mass production of armies of identical human neonates. I will briefly demonstrate the relevance of some social factors to the impact of research on the cloning of human beings.

Adoption of any technique is unlikely if there is a less costly means of accomplishing the same end. Anthropological studies of the spread of industrial technology in peasant societies indicate that the assessment of cost-effectiveness is based on a remarkably rational balancing of costs and benefits. For cloning of humans to become widespread, some clear advantage of standardization must be found which would outweigh the considerable cost of manufacturing human beings.

Suppose that a corporation, Clone Limited, desires to mass produce 1 million John Waynes and sell them to the U.S. Army, along with ten cloned Bob Hopes to staff USO tours. The immediate problem facing the corporation is the cutthroat competition of natural parents, who are producing nearly 4 million neonates a year at no cost to the government. The investment of tens of thousands of dollars and thousands of hours of child care is necessary to create an 18-year-old. The benefits of producing shoes all of the same size for the clonal army would not outweigh the costs.

Faith in economics of scale should not convince us that clones would be cheap to produce. Medical procedures are among the most rapidly inflating costs in the economy. Foster mothers for cloned ova would presumably demand compensation. If artificial uteri were employed, the capital investment required to produce large numbers of clones would be staggering.

Many advantages of standardization are available by nongenetic techniques. In *Brave New World* Aldous Huxley's scientists bred a race of retardates to serve in menial jobs such as running elevators. Modern self-service elevators illustrate that such jobs can be automated at a much lower cost.

Behavioral uniformity can be achieved without the expense of genetic manipulation. Documentary films of the 1930's show citizens of an advanced nation marching in lockstep, raising their arms at identical angles, and methodically murdering defenseless fellow-citizens. What we see in these films are "behavioral clones." What does it matter that the storm troopers are not genetically identical?

Having failed in mass merchandising, Clone Limited might well try a more restricted market, turning out copies of such elite human beings as Margaret Mead, Artur Rubenstein, Marilyn Monroe, or Sandy Koufax. These exceptional humans could be expected to be more productive than worker clones, promising returns commensurate with the costs of their production. Merely reduplicating the genetic material of a genius does not solve the riddle of his or her subsequent growth and development. Obviously we do not want to exactly reduplicate the adult genius (it would do no good to have an adult Charles Darwin in 1999 reveal that man was descended from the apes). What we wish is to preserve those exceptional qualities that led these persons to be so successful.

The problems outlined above are susceptible to solutions based on psychological research and experimentation. If one assumes advances in psychology and sociology, one faces the problems of alternative solutions to the problem of genius. There is no shortage of naturally occurring genius. If only .015 percent of infants are potential geniuses, a minimum of 500 each year await discovery in the United States. Investment in psychological testing research on a scale comparable to the basic research needed for cloning would produce comparable results at less cost.

Even if cloned geniuses were available at low cost, the question of their social impact remains problematic. Those who foresee the breeding of master races of Einsteins and Fermis tacitly base their projections on a great man theory of history, a social theory seriously weakened by extensive criticism. Once we recognize that intellectuals are subject to the restraints of their milieu, the idea that we can significantly affect the course of history by judicious breeding is seen in its proper perspective. An extraordinarily expensive program of cloning could, perhaps, double the number of geniuses in the country. They could join the ranks of the thousands of unemployed biologists, chemists, historians, and anthropologists around us today.

A similar disillusionment awaits the mad millionaire who seeks to perpetuate himself by cloning. He will be confronted by an offspring whose early childhood experience, peer relationships, life style, and points of view make him a stranger to his parent.

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