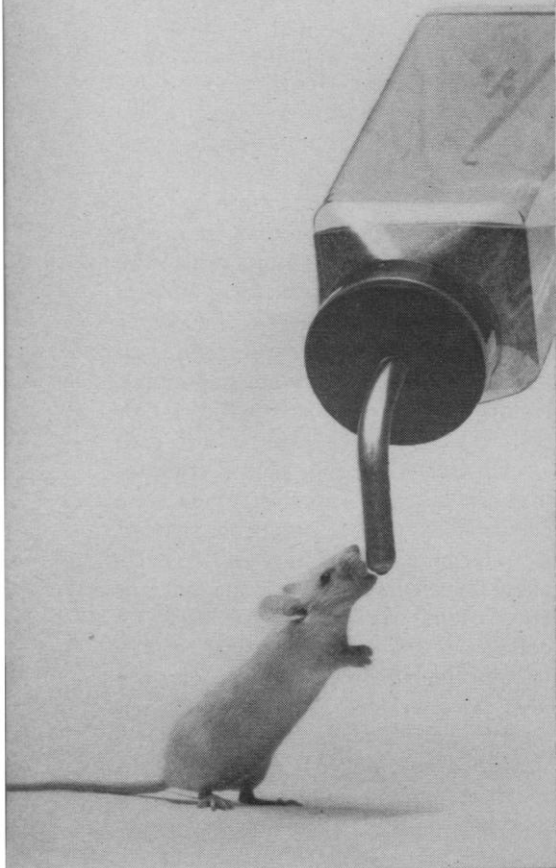


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the caveats so fully spelled out on earlier occasions (1). Besides, to have discussed at all adequately the prospective benefits, risks, and quandaries of possible eugenic programs would have required another occasion. Even more recently, in an address entitled "What man can be," I tried especially to emphasize the grave difficulties in the realm of value judgments which the new biological reproductive possibilities might bring about, and concluded:

I have asked many questions which cannot at present be answered. I have predicted a future in which many cherished values of our society and many ethical standards may be questioned or superseded. It is not sufficient to have a few scientists raise such issues. Only a prolonged and profound attention by many of the wisest men of our time, men of philosophy and religion, students of society and government, and representatives of the common interests of men throughout the world, together with scientists, may achieve a wise and sober solution of the crisis evoked in our world by scientific discoveries and their applications (2).

Let me suggest that there are rather better ways to judge a man's opinions than by reading his countenance or observing his gestures.

There is a more important point raised by the objections of Kass. He has ignored altogether the possibility that the introduction of eugenic measures through prenatal adoption will proceed on a voluntary basis. The experimental approaches used by R. G. Edwards in England are based on the voluntary consent and participation of women whose oviducts are blocked but who, together with their husbands, deeply desire to have children. My own files contain many letters from women who have indicated their hopes to have a child by such a method, whether because they are sterile or because of knowledge that in their families there are hereditary factors that might inflict a lifelong burden upon a child of their own. I think it quite clear that if such practices are introduced in countries of the Western World it will occur first through voluntary action. That is why genetic counseling must be greatly improved and rendered far more accessible to those who need it. The idea that, in the conceit of their ignorance, boards of experts will decide who may reproduce and who may not, is as repugnant to me as to Kass. Nevertheless, under a Nazi type of dictatorship, it might become a reality with which the world would need to reckon. The

biological developments indeed make the "brave new world" credible.

In the matter of the right of every child to be born "with a sound physical and mental constitution, based on a sound genotype . . . the inalienable right to a sound heritage," I shall not retreat. Incumbent on every prospective parent is the duty of ascertaining whatever is possible regarding the probabilities that his or her child will be mentally and physically sound. Since detection of heterozygous carriers is now possible for about 60 recessive genetic defects, and since chromosome defects, such as the extra chromosomes that produce mongolism (Down's syndrome) or a variety of serious sex deviations from the norm, such as the XYY condition, are detectable by amniocentesis, the way lies open to voluntary constraint in reproduction and to voluntary induced abortion in those states where the laws permit. I, for one, regard the New York abortion law as more significant in opening up the possibility of voluntary eugenic practice than in protecting the life of the mother in a few cases or in disposing of unwanted children in lieu of contraception.

BENTLEY GLASS

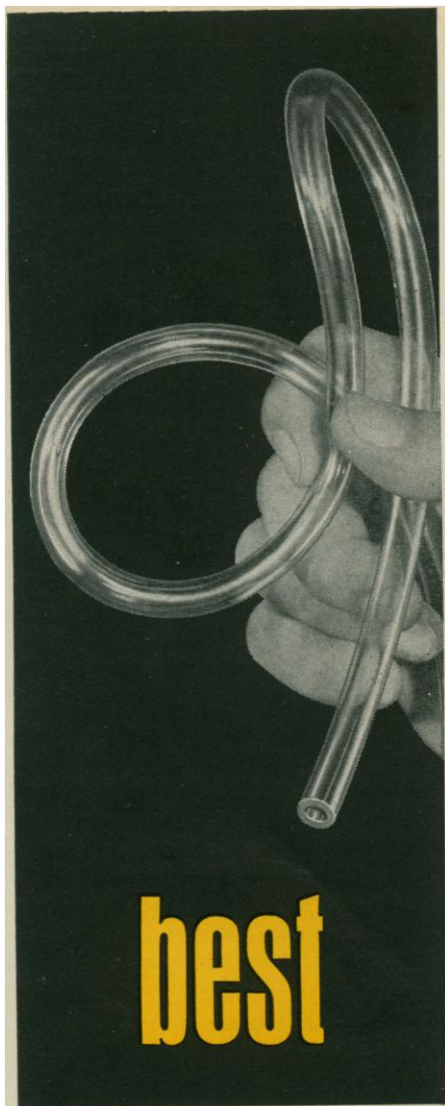
State University of New York
at Stony Brook, Stony Brook 11790

References

1. H. B. Glass, "Genetics in the service of man," in *Science and Liberal Education* (Louisiana State Univ. Press, Baton Rouge, 1959); "Human heredity and the ethics of tomorrow," in *Science and Ethical Values* (Univ. of North Carolina Press, Chapel Hill, 1965).
2. ———, *Educ. Rec.* 48, 101 (1967).

Restoring Bacterial Toxigenicity

The report by M. W. Eklund *et al.* (30 Apr., p. 480) on the restoration of toxigenicity by phage infection to nontoxic strains of *Clostridium botulinum* brings to mind a paper published 78 years ago on a closely related subject. Francesco Sanfelice's name is best known for his isolation of the pathogenic fungus *Cryptococcus neoformans*; however, in 1893 (1) he reported studies on anaerobic bacteria, including *Clostridium tetani* and related organisms that he regarded as indistinguishable except for their having lost the ability to produce toxin. In support of this evolutionary view, he studied the effect of culturing the nontoxic strains in sterile filtrates of the toxic bacteria. His crude assay methods



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were far from compelling, but they did indeed point to a toxic conversion quite analogous to that described in the recent report. Neither bacteriophages, nor their fascinating attributes of transduction or lysogenic conversion had yet been discovered; nor had toxins been purified. He may be forgiven for the naive speculation that the toxin itself was the active agent.

As far as I am aware, Sanfelice's experiment was never subjected to further verification, and it thus played no part in the further history of bacterial genetics. However, it was conceptually similar to the pneumococcus transformation, reported by Griffith 35 years later (a latent period familiar to geneticists). It is now a reasonable surmise that his observations were correct.

JOSHUA LEDERBERG

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Medicine, Stanford University,
Stanford, California 94305*

Reference

1. F. Sanfelice, *Z. Hyg. Infektionskr.* **14**, 339 (1893).

Nomenclative Etiquette

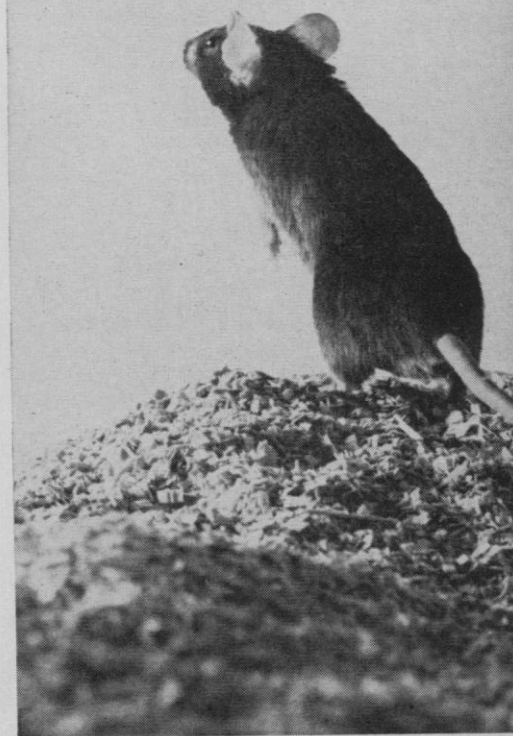
Plumb suggests (Letters, 19 Feb.) the suppression of the term centigrade so that "at some time in the future, degrees Celsius will be a natural expression." Why? Degrees centigrade is already a "natural expression" which furthermore describes the system as one of 100 degrees between reference points. Not so long ago, a perfectly understandable unit like cycles per second was changed to hertz, and spectroscopists are now forced to use nanometers when everyone has always understood millimicrons. Furthermore, I challenge anyone to demonstrate how "torr" is any more understandable than "mm-Hg." All this useless arbitrary pedantry torr my heart out. It hertz so much it gave me a fever, which steadfastly, I shall always measure in degrees centigrade.

BARRY M. AUSTERN

*Environmental Protection Agency,
Water Quality Office,
Ohio Basin Region, Cincinnati 45226*

It is not hard to understand why the medical people are switching to centigrade degrees rather than to Celsius. For centuries the doctors suffered under eponymic names: Prowazek-Greeff bodies (trachoma bodies), the Achard-Castaigne test (methylene blue),

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*U.S. Patent No. 3,256,857.

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