

Letters

Dangers of Reprogramming Cells

In an editorial, "Will society be prepared?" (11 Aug., p. 633), Nirenberg wrote about the prospects of molecular genetics:

Cells will be programmed with synthetic messages within 25 years . . . and when man becomes capable of programming his own cells, he must refrain from doing so until he has sufficient wisdom to use this knowledge for the benefit of mankind.

No subject of policy is more important than this, and it deserves the most critical debate. There is some danger that, whether so intended or not, Nirenberg's language could generate public misunderstandings that might undercut the very research needed to reach sufficient wisdom. His underlying concern, which I share, is that biological control might be used by a malevolent government to the peril of individual freedom. As Hitler's racial policy illustrated only too well, the State's access to forcible compulsion already gives it the power of genocide.

Presumably we have to be even more concerned about subtler mistakes. A well-intentioned government might impose rash commitments for the sake of short-term advantages. Plainly we must be very sensitive about innovations that, once introduced, constitute irreversible evolutionary deviations.

However, we should emphasize the distinction between eugenics, that is, programmed evolution, and euphenics, that is, the reprogramming of somatic cells and the modification of development. "Message" does carry a strong connotation of RNA messengers with somatic effects. To interdict such personal uses of messages would be hard to justify without a prohibition on all new medicine, especially such interventions as the use of hormones. If only germinal messages are meant, we have other prospects to worry about too. The manipulation of germ cells for genetic

surgery would almost certainly be preceded by techniques for clonal propagation and for chromosome manipulations in human beings, which would already have the most cogent evolutionary implications.

Human culture, as the late H. J. Muller has pointed out, is already a major commitment of individual development to formative influences decided by the community. Our educational systems are certainly a form of psychological engineering scarcely different in fundamental principle from the biological interventions that our knowledge of nucleic acids is likely to bring about.

Our main concern must be to maximize the role of individual decision. This could be defeated by overenthusiastic policing of personal initiative and experimentation as well as by premature positive measures imposed by the State.

In point of fact, we already practice biological engineering on a rather large scale by use of live viruses in mass immunization campaigns. While these are of indubitable value for preventing serious diseases, their global impact on the development of human beings of a wide range of genotypes is hard to assess at our present stage of wisdom. Crude virus preparations, such as some in common use at the present time, are also vulnerable to frightful mishaps of contamination and misidentification.

Live viruses are themselves genetic messages used for the purpose of programming human cells for the synthesis of immunogenic virus antigens. Nirenberg's cautions are just as relevant to considerations of contemporary policy as they are for the ever-widening applications of molecular biology in the near future.

JOSHUA LEDERBERG
*Department of Genetics,
Stanford University School of Medicine,
Palo Alto, California 94304*

Samuelson's article on the SST (8 Sept., p. 1146) emphasizes the future problems of the sonic boom, but certain parts of the country already are in the supersonic age. While camping deep in the Teton wilderness area of Wyoming this summer, our family experienced almost daily this menacing noise. Presumably these shattering onslaughts arose from planes based at nearby military centers.

The temptation to use unpopulated regions of the country for SST overflights must be great and will increase shortly. However, the Wilderness Act set aside a small percentage of our nation to be left unspoiled, and I am convinced that the SST must be excluded from such areas now and in the future.

ALBERT B. LOWENFELS
*95 Soundview Avenue,
White Plains, New York 10606*

. . . No mention is made by Samuelson of the bias evidenced in the sonic boom tests which are conducted by the Federal Aviation Administration and other agencies. Again and again, the investigators seem to strive to remove the main thrust of the sonic boom: its startle effect. It is well known that the boom, striking with no warning whatsoever, is highly startling; often it produces muscular spasm and marked increase in rate of heartbeat (1). But in the most recent sonic boom tests (2), the investigators actually warned the human subjects just before each sonic boom that the loud noise in question would occur "...in one or two minutes." In certain other tests (1) each subject knew *within five seconds* when the boom would occur. Also, in these two series of tests the subjects were adults, in good health, wide awake, and in a relaxed state of mind; they were participating in the tests voluntarily, were paid for doing so, were persuaded that the tests had scientific value, and knew that the tests would soon be over.

Consider, then, the temerity of the FAA officials and other SST proponents in implying that the results of the tests have *general* relevance! How different might the outcome be if the subjects were of nervous disposition or already under strain, were responsible for children and infants, and had already had their homes damaged by booms; how different would be their response if the booms came at irregular times, night and day, with no warning, if the sub-

jects believed the booms to be a needless and uncivilized outrage, if they had no place of refuge, and if the booming were to continue for the rest of their lives? And what about the musician making a valuable recording, or the surgeon performing a delicate operation?

WILLIAM A. SHURCLIFF
19 Appleton Street,
Cambridge, Massachusetts 02138

References

1. K. S. Pearsons and K. D. Kryter, *NASA (Nat. Aeron. Space Admin.) Rep. No. CR-187* (1965).
2. "Sonic Boom Experiments at Edwards Air Force Base by National Sonic Boom Evaluation Office," *Interim Rep. No. ETU-6065* (28 July 1967).

... What happens when an SST going at 1800 miles per hour passes a Concorde going at 1200 miles per hour in the opposite direction? Which cancels out: the superbooms or the superplanes?

ROBERT F. MARSCHNER
18427 Stewart Avenue,
Homewood, Illinois 60430

The Right to Breathe Pure Air

In a recent appearance I made on television to discuss the social and psychological effects of smoking, I mentioned that whenever a student came into my office with a lighted cigarette I asked him to put it out. A colleague asked me why. I responded that I found the odor of smoke distasteful and that I did not care to have the air in my office polluted. He said that I was interfering with student rights, and that in an office provided for by taxpayers, I had no cause to inject my personal biases. Our conversation became heated, but he did cause me to do some thinking.

Is smoking by students or anyone else a right? May they smoke on any public property except where smoking is expressly forbidden for reasons of fire safety? From a philosophical point of view, one person's rights end where another individual's rights begin. If students have a right to smoke, certainly I have a right to breathe pure air in my office. Since I have to spend the most hours at my desk, my right to pure air would surely outweigh anyone's questionable right to smoke at my place of public employment. When I have been breathing smoke-filled air, I acquire a headache, my eyes smart,

I cough, and my mental efficiency performance must decline. Thus a student smoking in my office would deprive other students of their right to expect a maximum performance from me.

Assuming that my office is a "public facility" and at the disposal and use of taxpayers, I wonder why the university issues me a key so that I am responsible for what takes place in it. Are all tax-supported facilities "public"? Could my colleague exercise his "right" to smoke in President Johnson's office at the White House? And I don't think that an executive of a private company necessarily has a greater right to privacy than a similarly situated individual at a state-supported institution. All necessary expenses of doing business at the private company are tax-deductible. This means that the rest of the public must then pay more taxes. For that reason, the public has a vested interest in the private sector of the economy as well as in the public part.

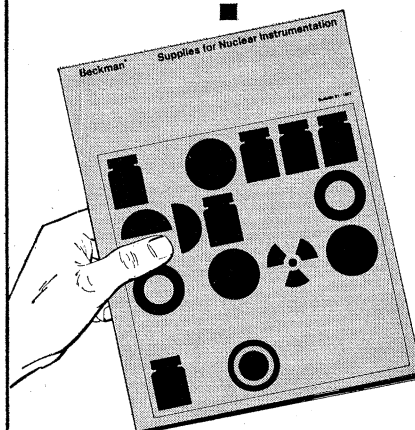
My own view is that the right to inhale pure air predominates over the right to pollute it. Every trip I take by air is marred by the smoke-filled air in the cabin of the plane. Couldn't the airlines, while passing out free cigarettes, also set up smoking compartments? Even an outdoor event, such as a football or baseball game, doesn't assure the spectator a supply of unpolluted oxygen. Aside from the ever-present industrial and domestic pollutants, a pall of tobacco smoke hangs over most of our occupied stadiums. Sometimes visibility is seriously impaired.

Columbia University recently announced its interest in a new cigarette filter. Aside from the obvious point that all filters are virtually useless in preventing the consumption of such substances as carbon monoxide, aldehydes and phenols, many of us non-smokers are wondering if the filter developers aren't barking up the wrong tree. What we really need is a filter to protect us from the smoker. With all our research into the causes of air pollution, haven't we overlooked smoking as one of the prime causes? We might make a start by restricting smoking to private homes and to public smoking lounges, but such a proposal is not within the bounds of reason at this time.

GUS TURBEVILLE
Department of Sociology, Wisconsin
State University, Superior 54881

Nuclear supplies

?



Buy 'em from Beckman direct-order supply catalogs

and get same-day-shipment service on all these off-the-shelf Nuclear items:

Vials	Storage Cabinets
Primary Fluors	Syringes
Secondary Fluors	Filters
Standards	Absorbent Paper
Solvents	Printer Paper and Ribbon
Quench Sets	Sample Dryer
Planchets and Holders	Warning Tapes and Signs
Counting Gas	
Test Sources	

from the nearest of our coast-to-coast stockpoints. Direct-to-you delivery means you can now fill every need whenever you feel the need. And who knows your analyzer supply requirements better than the instrument manufacturer? Other catalogs list supplies for IR, UV, GC, pH, Atomic Absorption, Aquameters & Titrators, Pumps & Fittings. Order the specific catalogs you need now and take advantage of special introductory offers. Contact your nearest Beckman office or write direct for Data File No. 1301D.

Beckman®

INSTRUMENTS, INC.
SCIENTIFIC INSTRUMENTS DIVISION
FULLERTON, CALIFORNIA • 92634

INTERNATIONAL SUBSIDIARIES: GENEVA; MUNICH; GLENROTHES, SCOTLAND; TOKYO; PARIS; CAPE TOWN; LONDON; MEXICO CITY