Letters

Scientists and Eugenics

In his editorial of 16 July (p. 251), Abelson explained—rightly, in my opinion—the even greater importance of the acquisition by man of the ability to change his genetic constitution in predetermined directions than of the ability to make nuclear weapons. As he further pointed out, such revolutionary power inevitably becomes applied, and here lies the enormous danger of its falling into the hands of those representing what R. D. Hotchkiss termed "private profit and ignorance." Among the forms of such asociality and ignorance are especially to be included class, race, and national biases, and social naivety of other kinds.

This situation becomes sharpened by another circumstance referred to in the editorial. That is the existence even now of "practical means of controlling human heredity and evolution," by the use of sperm banks, as was advocated in my chapter in the book under discussion, *The Control of Human Heredity and Evolution* [T. M. Sonneborn, Ed. (Macmillan, New York, 1965)]. This method would employ the relatively modern techniques of preserving cells indefinitely without deterioration, by deep freezing. This procedure allows better perspective to be gained on the donors than when freshly obtained cells are used, it avoids personal entanglements between donors and recipients, and it thereby allows the latter to make open, informed choices of their own.

However, contrary to what Abelson implied, this procedure does not call upon "the new knowledge of genetics." In fact, I gave reasons for regarding the intelligent application of molecular genetics in a major way as being remote in the case of man. It is just because the genetically less elaborate procedure does not require this knowledge that it is already applicable. And yet it is nonetheless of high potential efficacy in achieving results sought, and carries less risk than punctiform operations do of resulting in biological imbalances.

The early misuse of this readily available technique somewhere on this planet is likely, and would then tend to spread. It would be futile for scientists to attempt to suppress it. But neither should they simply give way to the despair expressed in Abelson's conclusion. It is their social responsibility, instead, to join with humanistically oriented persons in providing a model pilot enterprise along these lines. Such an enterprise should endeavor to demonstrate how such techniques, when put to the service of the already widely recognized human values of brotherliness, general intelligence, creativity, and physical well-being, can result in inestimable good rather than catastrophic harm. Such an enterprise can, however, set a wholesome example only if carried out, without any dictation, by the purely voluntary action of the participants, guided by the best scientific information and humanistic advice available.

This means that preliminary banking, small-scale testing, and research in diverse contributory fields should be begun now, for wider application some decades hence. Even a small undertaking of this kind requires, to be sound and successful, a considerable effort. It therefore becomes necessary for people in general and more especially scientists (including geneticists, psychologists, medical men, and so on), humanists, and publicists to be not only educated in matters relevant to the enterprise but also *motivated*. That is why—in the face of the traditional taboos and the wishful thinking prevalent in some circles, even of scientists—what Abelson termed "evangelistic zeal" has its necessary place in any such program. Have we not had enough lessons concerning the dangers of the puristic ivory-tower attitude still dominant in many "scientists" and "humanists"? The best answer that scientists can make to those who would misapply such a technique is to join with others in showing how it can be applied constructively.

HERMANN J. MULLER
Institute for Advanced Learning in the Medical Sciences, City of Hope, Duarte, California

Abelson's editorial will leave many a reader with an unsatisfied feeling. Abelson has opened up the problem of the uses of science, but he has not explored it very far. He says: "Geneticists will create new knowledge and will have high ideals for its application. In practice, power to apply that knowledge, as was the case with atomic energy, will rest in other hands." Since our society functions under a system of specialized division of labor, it is a matter of course that the power to apply the results of science rests in hands other than those of the scientists who made the discoveries. Abelson is of course justified in entertaining doubts as to whether the new genetics will result in a utopia for man. But his possible implication that if the scientists had the power they would use their knowledge in accordance with high ideals, but that *hoi polloi* will use it for bad purposes, is an insult to nonscientists. . . .

The problem of the uses of science has been sharply posed for modern man by the discovery of atomic energy. This problem takes on renewed urgency from the prospect that developments in the biological sciences, particularly in genetics, may create a new and worse "atom bomb" situation for human civilization.

Scientists as well as the lay public used to believe that the progress of science and its applications represented an absolute good. Today the old belief is being modified to the extent of saying that science as it comes out of the laboratory is pure and good, and that "only man is vile"—that is to say, that it is the nonscientists who misuse it and turn it to evil purposes.

But it seems to me that if we seriously face the fact that science can be used for both good and evil purposes, we must abandon the idea that science in itself is an absolute good. It is the moral progress of the individual and of society which is the absolute good and which alone gives value to scientific knowledge, whether pure or applied. Thus the pursuit of knowledge must be coordinated with the adjudged safety

with which this knowledge, if attained, can be entrusted to human nature in its present state of moral development. Otherwise we put ourselves in the position of the small boy who blows himself up by playing with explosives. . . . If scientists as human beings are concerned with the dangerous possibilities of "scientific progress," they can best serve mankind by doing their part in promoting the restoration of a healthy and proper sense of moral values.

BENJAMIN GINZBURG
5550 Columbia Pike,
Arlington, Virginia 22204

The control of human evolution by genetic treatment will probably overshadow the impact of the use of nuclear energy upon man's destiny. However, this achievement does not seem to be the great revolution in human history which Aldous Huxley foresaw when he wrote, as quoted by Abelson, "The really revolutionary revolution is to be achieved not in the external world but in the souls and flesh of human beings."

The external world is the objective world we are aware of by computing the signals collected by the sense organs. The internal world, the world of "the souls and the flesh of human beings" investigated by Huxley, is the introspective one revealed through the different states of awareness that can be reached in deep meditation.

To the internal world belong, on one hand, the "phantoms" built by a religiously indoctrinated imagination and the fantastic impressions generated by psychedelic drugs and, on the other hand, the inspired flashes of the scientists and the poets and the incommunicable states of awareness reached by the true mystics.

The discovery of the internal world is a strange experience. This discovery may drastically change the way of living of an individual by giving him the knowledge of the existence of a reality which transcends the reality of the physical world. If this knowledge were largely shared, the human race would probably enter a new phase of its evolution. Unfortunately, this knowledge is solely the result of a personal experience and apparently cannot be taught.

Contemporary scientists, objectively trained, are not inclined to accept the possibility of a *spiritual* mutation of the human race. But for those who accept the possibility of such a mutation, as suggested with persuasive arguments by Teilhard de Chardin in *The Phenomenon of Man* (Harper, New York, 1961), this mutation, and not the control of human evolution by genetic treatment, will be the revolutionary revolution prophesied by Aldous Huxley.

ANDRE L. JULIARD
Green Acres, Bryn Mawr, Pennsylvania

"Disjointed Incrementalism"

In his article "National planning for medical research" (25 June, p. 1688), Handler discusses the dynamics of planning in the face of unknowns and uncertainties which are characteristic of biomedical research. He states that research gains are achieved through a process of "disjointed incrementalism" rather than through balanced, overall planning. To make progress, a critical mass effort must be applied against a target. A resulting payout may cause an imbalance in knowledge to occur, says Handler, but the imbalances are self-correcting through a variety of mechanisms. He adds that such an irregular pattern of advance is more in conformity with reality than planners would have the rest of us—and themselves—believe. His arguments are directed toward the planning of breakthroughs, which he says cannot be planned although the exploitation of actual breakthroughs can be.

Handler's arguments are persuasive, especially within the context of the pursuit of knowledge. In the real worlds of social, economic, political, and military action, disjointed incrementalism has often furthered the public good but it has also been followed by disaster and grief which could or should not have been left to self-correction.

The emerging dangers in the real world of biomedical affairs lie in the ensuing phases of exploitation after breakthrough. There we have not really had the planning which Handler says is feasible. Rather, political considerations associated with the funding of medical affairs have led people into premature exploitation of laboratory findings and statistical inferences. Some of the perturbations in the area of chemotherapy are due to premature application of such findings in spite of ignorance of drug effects; that is, the side-effects problem. Assumptions in mental-health planning must now be revised because psychopharmacology has not paid off as first hoped and promoted. Public-relations gains were