LETTERS

Sociobiology: The Underlying Concept

Darius Baer (Letters, 28 Apr., p. 382) presents as the "underlying concept of sociobiology and behavioral genetics" the formulation $P = G + E + (G \times E)$, where "P is the measured value for some character of an individual (behavior or otherwise), G is the value conferred upon the individual by its genotype, E is the environmental deviation resulting from all nongenetic causes, and $(G \times E)$ is the deviation resulting from genotype-environment interactions or the differential response of different genotypes to different environments." This incorrectly implies that a phenotypic trait of an individual can be partitioned into distinct genetic, environmental, and interactive components. It is equivalent to saying that if A is 6 feet tall, then perhaps 5 feet may be attributable to his genotype, 8 inches to his environment, and 4 inches to the interaction between the two. In fact, every inch of A's height is due to the interaction of genotype and environment, so Baer's statement is more accurately recast $P = G \times E$.

Presumably, Baer was thinking of the formulation $P_{var} = G_{var} + E_{var} + (G \times E)_{var}$. This statement is conceptually correct, but it refers to the *variance* in a trait; that is, it is true of populations, not individuals. Thus, if we measure a sample of people (of which 6-foot-tall A is one), we can obtain a measure of the variance for height in the population, and with sufficient other information we can also obtain an estimate of the heritability of the trait—the fraction of phenotypic variance attributable to genotypic variance. But by its definition, heritability is a population phenomenon only, saying nothing about individuals. Heritability also says nothing about the extent to which a trait is genetically controlled (its canalization); in fact, traits with a large impact on fitness usually have a very *low* heritability—because additive genotypic variance for such traits tends to be low.

In addition, Baer says, "There are no claims to date by authentic sociobiologists to *definite* race or sex differences. . . ." This is misleading: to my knowledge, no sociobiologist has made any claim whatever concerning race differences. Indeed, since it points to the biological universals shared by all *Homo sapiens*, a field of human sociobiology, if it were to exist, would be a potent antidote to racism. Finally, I object to Baer's implication that sociobiology will have something to say about genetic engineer-

ing. We are left with the image of science and society, linked arm in arm, marching off to greet the Brave New World under the streaming banner of sociobiology. It just isn't so.

DAVID P. BARASH
Center for Advanced Study in the Behavioral Sciences, 202 Junipero Serra Boulevard, Stanford, California 94305

The Icarus Legend

In his review (12 May, p. 673) of D. A. Reay's *The History of Man-Powered Flight* (*1*), Robin Higham states, "Reay conclusively shows that Icarus could not possibly have flown from Crete to the mainland of Greece. Someone needs to reexamine that legend to see what his real objective might have been or whether he might have been under the influence of hallucinogenic drugs." Icarus certainly did not make the flight; he fell into the sea and was killed. Daedalus, father of Icarus, made wings to escape from imprisonment by King Minos and reportedly flew to Sicily, not Greece. Since the distance is approximately 450 miles, he may be suspected of having made the major part of the journey by ship. Hallucinogenic drugs are not the only cause of strange opinions; too much sun may also be harmful.

TERRY F. HUFF
Arkansas Department of Pollution Control and Ecology, Little Rock 72209

Reference

1. D. A. Reay, *The History of Man-Powered Flight* (Pergamon, New York, 1977).

Neuroendocrinology: Pioneering Efforts

In the second of his three articles on Guillemin and Schally, Nicholas Wade (News and Comment, 28 Apr., p. 411) refers to the forthcoming volume 2 of *Pioneers in Neuroendocrinology*, edited by Joseph Meites *et al.* (*1*). He omits, however, any reference to volume 1 of this publication, which is already available (*2*). I wish to call volume 1 to the attention of *Science* readers, particularly the chapter on "Neurosecretion and its role in neuroendocrine regulation" by Berta Scharrer. There we learn that in 1928—when Guillemin was 4 years old and Schally was 2—Ernst Scharrer discovered that certain hypothalamic neurons specialize in secretory activity to a degree comparable to that of endocrine