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able argument about the accuracy of his estimate, based upon various assumptions about the kind of stade he used, and that no one seems to have attacked the question directly by measuring the average speed of a camel.

Tobler has called my attention to the work of James Rennell [*Phil. Trans. Roy. Soc. London* **81**, pt. 2, p. 129 (1791)]. Rennell studied the speed of a camel by analyzing the records of a number of desert travellers, and actually proposed that the camel be used as the distance-measuring device in the initial surveying of Africa. Comparison of his results with the work of Eratosthenes reveals an interesting circumstance.

Briefly, Rennell found that the hourly distance travelled by a camel is almost independent of the loading and is remarkably constant. He found a rate of about 2.5 statute miles per hour, with deviations of about 2 percent. The daily distance does depend upon the loading; apparently the more heavily loaded camels simply stop sooner and refuse to continue. For the "heavy caravan," after allowing for stops and the sinuosity of the path followed, he found an average day's journey of 16.6 miles per day, and about 10 percent more for the "light caravan."

Eratosthenes gave 50 days' journey as the distance from Aswan to Alexandria. From an atlas, I judge this distance to be about 520 statute miles, giving 10.4 miles as the "camel-day" in Eratosthenes's time. Thus camels in 1791 travelled 60 to 75 percent faster than camels in 250 B.C., according to the assumptions made about the loading of Eratosthenes's camels. The most likely explanation of this large discrepancy is improvement in the breed.

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## Genetic Code: Exaggerated Claims

In your editorial of 22 May you quote the statement by Glenn T. Seaborg of the AEC that "inevitably our recently acquired knowledge of the genetic code will be applied also to the improvement of the human species." As a graduate student of biochemistry and molecular biology I find the appearance of such a statement in the pages of *Science* profoundly unsettling.

Without a doubt recent advances in

molecular biology have opened provocative new vistas both for the acquisition of knowledge and for its application; indeed I believe the coming decades will find this to be the most exciting field of science. Nevertheless, this very fact should make the scientific community aware of the need to guard against sensationalism. We are far from a full elucidation of the genetic code. Many of its most basic features are understood only poorly and some not at all (for example, the sequence of bases within a codon, intercistronic punctuation, and the various kinds of suppressor mutation). The 22 May issue of *Science* gives some idea of the situation in the dispute between Woese and Hinegardner and Engelberg ("Universality in the genetic code," p. 1030).

But leaving this aside, there is the much more fundamental question of the aims of scientific endeavor and the responsibility of scientists to make these aims clear to the public (which foots the bill) and especially to avoid suggesting melodramatic results which are not attainable with presently foreseeable means. Specifically, I know of no way whereby human heredity will "inevitably" be altered because of present studies on the genetic code. It would be fascinating to hear a concrete suggestion. Until the time when such suggestions become current and scientifically responsible, however, I think that a reputable and influential journal such as *Science* should refrain from spreading generalizations which inevitably will lead to disillusionment and mistrust of science, or an irrational fear of Frankenstein.

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## Meharry Medical College

We sympathize with the University of Skopje, Yugoslavia (Letters, 19 June, p. 1409), in the loss of their modern laboratories. However, they are far more fortunate than we are, for we have never had a modern laboratory. The Department of Pharmacology at Meharry is housed in converted army barracks; the renovations were carried out by the faculty and staff aided by minute grants from two pharmaceutical houses (the only responses to numerous letters sent out by members of the faculty). The building has no permanent heating system; the furniture