and engineers in order to produce more "complete, universal men." University reform and elimination of obsolete methods and practices is imperative in Italy, but international vilification of the *Mater universitatis* and her students and graduates is not.

GIORGIO SOLI

41–885 Laumilo Street,
Waimanalo, Hawaii 96795

Reference

1. L. Barzini, *The Italians* (Atheneum, New York, 1964).

Zond 5: Sketches and Guesses

While I generally agree with the uses of the Zond 5 class of (Soviet) spacecraft proposed by Davies and Murray (11 Oct., p. 243), their description of Zond 5 as being comparable in design to the Soviet Mars and Venus probes is, I think, wide of the mark.

The sketch in Dmitriyev's article (*Pravda*, 25 Sept.) does show three sections for the spacecraft in its parking orbit. However, it is easily seen that the section described by Davies and Murray as containing a midcourse rocket motor (that is, a rocket engine) is not that at all. It is, in fact, the upper stage of the booster rocket and its purpose is to inject the Zond 5 into its translunar trajectory. That upper stage adds some 10,400 feet per second (3120 meters per second) to the Zond 5 which at that point already has an Earth satellite velocity of perhaps 25,400 feet per second. Midcourse engines add only corrections of the order of hundreds of feet per second and often less ΔV. The stage was ignited 67 minutes after the initial launching and discarded after burn-out, leaving only *two* compartments. All this is described by Dmitriyev and is shown in his sketches. He describes a sphere—the "descent vehicle"—and an instrument compartment as leaving the parking orbit.

Despite Dmitriyev's relatively detailed article, both Davies and Murray and myself will have to await photographs of the Zond 5 spacecraft comparable to those of the Venus 4 released by the Soviet Union. The latter were sufficiently detailed so as to permit counting of threads in the "plumbing," whereas the crude sketches of Zond 5 give rise to an extended guessing game, no less.

SAUNDERS B. KRAMER

1241 Eureka Avenue,
Los Altos, California 94022