Letters

Professional Education in Russia

If the summary in "Science and the news" is correct [*Science* **135**, 204 (19 Jan. 1962)], Nicholas DeWitt seems to misinterpret Russian scientific and professional education in at least two respects.

1) Charitably, or perhaps optimistically, we include undergraduate colleges among our "institutions of higher education" (*ibid.* Table 1, p. 205). The graduates of Soviet secondary schools, like graduates of the French lycée or German gymnasium, at the age of 18 have reached approximately the same educational level as the American student who enters his junior year in college. Accordingly, 30 percent of Soviet students (Table 1, line 4) had completed what amounts to about 2 years of our college, whereas it appears that only 23 percent of our eligible students *entered the freshman year* (Table 1, line 5).

2) It is probably true that "*no* higher educational establishment in the U.S.S.R. offers non-specialized professional instruction such as the general studies or liberal arts programs common in American colleges and universities." However, I think it is wrong to conclude from this that our Soviet colleagues "lack . . . humanistic education and disregard . . . cultural, ethical and social values cherished by the West." The Russians I have met over the years seem to be less well educated in painting and sculpture than many of my colleagues in France or Britain or this country. However, they are perhaps more broadly educated than are most of us in literature and the performing arts. I can cite a Russian neurologist, an illiterate shepherd boy before the Revolution, who could discourse on modern French literature, or a neurosurgeon who could quote Shakespeare as well as Pushkin extensively—though both in Russian. These are older people, but I have met a few young scientists who also seemed to be at least as well cultivated as our own graduate students or young Ph.D.'s—which may not be saying very much, of course.

A significant and perhaps even a more objective measure of the comparative cultural levels of our own and of Soviet students could be provided by figures on attendance at theatres, concerts, and so on, and by an analysis of the reading material, type and number of literary journals, their circulation, and the use of library facilities. From the few data I have seen on this score, it appears that the cultural level in the U.S.S.R. is not lower than the level in our own country.

It would be much more significant and healthier for our education if we compared commensurable quantities, though this may be difficult and sometimes, perhaps, even unpleasant. Furthermore, it is deplorable to say, as DeWitt does, that Russians show "disregard for the cultural, ethical and social values cherished by the West." The Russians seem to have the same Greco-Judeo-Christian cultural and ethical (though not religious) values that dominate the West. Their social values, undoubtedly, differ from ours, but so do those of many other civilized countries.

HARRY GRUNDFEST
College of Physicians and Surgeons, Columbia University, New York, New York

Space Research

I was interested as well as intrigued to read Howard Margolis's note "Money for space: The program's managers fear the public does not understand the issue" [*Science* **134**, 1602 (1961)]. The case of the public's not understanding the issue on the reasons why the Administration should spend $20 billion on space research and extraterrestrial projects does require serious attention. While research in general science and technology is an accepted part of the work of present civilized society, we of the underdeveloped countries fail to fathom and to conceive clearly why such a staggering amount should be spent on space research only. This amount could well-nigh feed, clothe, and shelter Asia's teeming millions. I wonder whether it is really necessary to spend such a large amount *at this stage* on such projects. Could not this amount be more profitably utilized in other fields of research which directly affect humanity on earth?

We of the underdeveloped countries place a high value on research, for it is this very characteristic that has enabled some of the Asian countries to industrialize themselves much more rapidly than would have been possible otherwise. The practical benefits are clearly visible here. However, when it comes to spending staggering amounts to send

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