

laboratory, that gravitation is to be somehow derived from nuclear or atomic physics. I would suggest that this is to put the matter the wrong way round: the dominance of gravitation in the universe might lead us to ask whether nuclear or atomic physics should not somehow be derived from gravitation.

The large optical and radio telescopes or orbiting astronomical observatory needed for the study of galaxies are expensive. If any such devices are recommended, I would urge that emphasis be placed on the need for careful planning. All aspects of the design of the instrument should be completed before construction begins, pilot projects should be undertaken, the scientists who are to use the device and who know why it is needed should be involved in the project throughout, and so on. It might be thought that these are points too obvious to mention were it not for the sad history of the 600-foot dish at Sugar Grove. Above all, I think that the competitive aspect, either between scientists in one country, or between nations, is to be avoided. The aim should be not the out-doing of the other fellow at the price of hasty and slipshod work, but the nearest approach to perfection of which we are capable.

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Lunik III Photographs Reinterpreted

In a review of recent advances in solar-system science ("Space: Highlights of recent research," 11 Sept., p. 1129), Jastrow and Cameron suggest that one of the most interesting of recent finds about the moon was the discovery of the "Soviet Mountain Range" on the rear side of the moon. They correctly suggest that this range, if similar to terrestrial examples, requires revision of our theories of lunar structure. We wish to point out that after a thorough reprocessing and study of the Lunik III photographs, Whitaker concluded that the "Soviet Mountain Range" was nothing more than a combination of bright rays from two ray centers and does not represent relief [*Commun. Univ. Ariz. Lunar Planetary Lab.* 1, 67 (1962)]. In recent correspondence Breido, Schegolev, and Lipsky, who were responsible for the

misidentification of the feature, have agreed that Whitaker's interpretation is more likely correct. Further study of possible differences between the earthward and far-side hemispheres will be greatly aided by photography, preferably under morning light, of the one-third of the far side which has still never been seen.

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Space Poll

The editorial on the AAAS "space poll" (7 Aug., p. 539) must be disappointing to many statisticians and to others trained in statistical method. We are accustomed to expect AAAS and *Science* to display much of the best in scientific thought and practice. The space poll, as presented and interpreted by the editorial, falls far short of that standard as a reflection of present-day survey methodology.

It is entirely appropriate that *Science*, by means of surveys, obtain the opinions of its membership and report them. But it is reasonable to require that the sample be representative of the membership. And many consumers of the report might ask to know how the AAAS membership compares occupationally with the scientific community generally, or to see an accompanying distribution of AAAS membership by field of primary interest.

The poll is offered as a probability or random sampling of "the best minds of this nation," and thus invites the reader to believe that the conclusions are scientifically sound, when in fact they appear to rest on a doubtful technique. Several objections might be raised, but the critical weakness is acceptance, without investigation, of the 56-percent response as being representative of the target population. Obviously, biases can arise from a high rate of nonresponse, and in my opinion—shared by many, I'm sure—an inquiry cannot be accepted as a probability survey unless nonresponse is reduced to a small proportion of the designed sample, or at the very least until the representativeness of the respondents has been explored and found to be satisfactory.

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The remarks of a former president of the American Chemical Society quoted in Abelson's editorial of 7 August ("AAAS space poll," p. 539) seem chauvinistic and inhumane. Inasmuch as "we" are only Americans we can perhaps afford to spend our surplus on technological virtuosity and shrug off the cost. But inasmuch as "we" are mankind we are poor and in need. We have to struggle against disease, malnutrition, and ignorance that this same money could ameliorate if some of it were spent not "within the country" but without regard to country. In the long run, this might be not only a "vastly better" but the only way to avoid war.

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Bigotry in Scientists: Sources

As a psychoanalyst who works in a university setting, I was most interested in Abelson's editorial "Bigotry in science" (24 April, p. 371) and I would concur with Jesseph in his letter "Bigotry in scientists" (26 June, p. 1529), in which he opines that bigotry in scientists is "another proof that they are merely human."

But to transfer the onus for bigotry from the scientist to his parents seems to me unfair. With all of a psychoanalyst's appreciation for the power of parental precept, there are additional forces, and probably more important ones, which predispose the scientist, or anyone else, toward bigotry as defined in the *Science* editorial. For example, aging and tenure seem to be important factors, or the stoking of the hot fire of ambition by success, or the wish to hold onto one's gains and status taking precedence over the wish to renew the attack on the frontiers of knowledge, or the subtle loss of appreciation in the older person for the drive of youth toward the new, a drive which sometimes "leapfrogs" the conventional and the established and takes the lead in progress.

The same alliance of conservatism with aging can be observed both in the individual and in his organizations, scientific, political, or whatever.

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