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Incorporating Science News Letter

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COVER: Avalanche! But on Mars! This remarkable photo, taken by the Viking 1 orbiter on July 3, shows a huge canyon called Capri, a tributary to the huge Valles Marineris. The vast flows across the canyon floor are believed to be the result of giant avalanches, perhaps triggered suddenly by seismic activity after millions of years of surface abrasion had weakened the tough surface layer. See continuing Viking coverage p. 38. (Photo: NASA)

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LETTERS

Pluto's diameters

Your recent article concerning Pluto's mathematically shrinking diameter (SN: 4/10/76, p. 229) failed to explore the implications such a diminution had for the planet's density. Previous analyses had reduced the diameter from 6,400 kilometers to 5,800. Coupled with the most recent Plutonian mass value of 11 percent of earth's, or 7.2×10^{20} tons, the former density estimates ranged from 4.85 to 6.44 g/cc. But, if the Plutonian diameter is actually as low as 3,500 kilometers, the density will mushroom to 29.8 g/cc, an impossible figure! Even if constituted of pure uranium, Pluto's density could not exceed 18.95 g/cc. Hence, a scientific anomaly appears to be developing.

Franklin R. Ruehl, Ph.D.
Glendale, Calif.

(David Morrison of the University of Hawaii, one of the researchers, says, "To compute a density, we must know both mass and diameter. The mass of Pluto could be determined, in principle, from its gravitational perturbations on the motion of Uranus and Neptune. However, these effects are very small, and different analyses yield different values for Pluto's mass. The most comprehensive discussion [Ash, Shapiro and Smith, SCIENCE 174: 551] concludes that present data are simply unable to yield a mass for the planet." He adds that Pluto's accretion in the presence of methane might well have produced a methane-ice-laced body, perhaps like the head of a comet or a chunk from Saturn's rings with a not unreasonable density of as little as 2 grams per cubic centimeter.—Ed.)

The relevance of social science

Perhaps on the average, students do consider courses in the social sciences to be "easier" than courses in the natural sciences [R_x education: Back to basics (sort of), (SN: 6/19/76, p. 391)]. Indeed, it is conceivable—though by no means demonstrated—that social science courses are less difficult for most students. But if true, then the prescription for social scientists is clear: They should strive to make their analyses more scientifically rigorous, and they should be more demanding of their students. The problems tackled by social scientists are as intractable and as complex as those in the natural sciences, to be sure.

To suggest that students generally tend to

"use their elective options to take social science courses rather than study the natural sciences" primarily because the former are thought to be less difficult, slanders students and ignores their more compelling reasons for taking social science courses. I would submit that large numbers of students turn to the social sciences because they recognize that the most urgent issues confronting humanity at present are social, cultural, and political—not technological. They are aware, as they should be, that many of the dangers faced by people throughout the world (e.g., overpopulation, pollution, nuclear warfare, civil strife, racism and hunger) will not be ended by advances in the natural sciences and technology. In fact, some of these problems are the unfortunate byproduct of just such developments. If solutions to these problems are to be found, the social sciences will have to focus on them. The social sciences are responding to the challenges of our age. Students' choices of courses reflect their assessment of the value of these efforts and the importance these fields hold for the future of mankind.

Ralph Bolton, Ph.D.
Associate Professor of Anthropology
Pomona College
Claremont, Calif.

Physics and the Good Humor man

Up, down, strange, charmed, truth or beauty, red, white and blue—these are all very well and good, but what flavors do quarks come in?

Or for that matter, do quarks and leptons come in standard sizes or must they be custom made?

Wesley Perkhiser
Great Lakes, Ill.

(You quoted the flavors: up, down, strange, charmed, etc. We could just as easily say vanilla, chocolate, strawberry and chocolate fudge swirl. When we reach 28, we can paint the roof orange. Size is what you make it. They could all have zero waists.—Ed.)

Universal morality?

Eventual human contact with alien civilizations (SN: 6/5-12/76, p. 379) would present a problem only to those religions which are universalistic, i.e., those that apply their concepts inclusively.

I believe that toward the end of the Messianic Age humanity will qualify to enter into the company of other intelligent beings who because of their morality are also creatures in the image of God no matter what their physical shape or cultural values are.

Rabbi Allen S. Maller
Temple Akiba
Culver City, Calif.

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