ing options.

I believe these early reports and articles contributed substantially in the public debate on the MX, which, unlike the impression conveyed by the piece in PHYSICS TODAY, did not confine itself to classified documents (how can classified documents contribute to a public debate?) and reports to the Congress.

KOSTA TSIPIS
Massachusetts Institute of Technology
Cambridge, Massachusetts
2/82

PhD not dropped

A recent article ("Foreign Grad Students Raise Enrollment," June, page 62) erroneously lists the Colorado School of Mines among several universities having dropped their PhD programs in physics. To set the record straight, the Colorado School of Mines offers the MS in physics and PhD in applied physics and has no plans to drop either program. On the contrary, both programs are experiencing rapid growth. Prior to the approval of these degrees in 1968 and 1978, respectively, the school offered interdisciplinary MS and PhD degrees in physics combined with engineering. Nine such interdisciplinary degrees have been conferred, four at the doctoral level. Since approval of the new degrees, 24 MS degrees in physics and one PhD in applied physics have been conferred. Both progams are healthier now than at any time in their existence. Of the 20 graduate students enrolled last fall, five were in the PhD program. We expect to have six in the program this fall.

Research associated with these programs is concentrated in several areas having application to the energy and mineral resource fields. These include solid-state and materials science, solar energy, surface physics, nuclear physics, geophysics, particulates and lasers. The largest effort by far is in solid-state and materials science, some of which is in collaboration with the nearby Solar Energy Research Institute.

Apparently the error in the June article came about because I had not checked the box labeled "Doctor's" on the AIP form for the Annual Survey of Enrollments and Degrees.

FRANKLIN D. SCHOWENGERDT
Colorado School of Mines
Golden, Colorado
7/83

Erroneous siting

The December "Washington Reports," concerning the termination of the Brookhaven CBA (page 41), erroneously states that "Los Alamos has suggested SSC could be located in the picturesque caldera of an ancient volcano just a few miles southeast of the laboratory." This romantic notion is unfounded in fact and contradicts elementary geological considerations, as could have been found by a phone call to informed sources, or even a superficial glimpse at the appropriate topographical map. As an institution, Los Alamos National Laboratory has no intention of competing for administrative control of the SSC. Individual scientists at Los Alamos are understandably interested in participating in the development of this exciting facility.

The interplay of technical requirements with realities of site possibilities (very restricted for such a large facility) requires an early consideration of sites and their constraints on R&D issues. As a preliminary step in this direction, a collaborative (rather than competitive) working group has assembled the first edition of a site atlas (R. Slansky, "Site Atlas for the Superconducting Super Collider," Los Alamos Report LA-UR-83-3078), to facilitate an objective study of site-related issues. The first edition contains contributions from Arizona, Colorado, Illinois, New Mexico, Texas and Utah. We hope that subsequent editions will include all realistic possibilities in the US.

PETER CARRUTHERS
RICHARD SLANSKY
Los Alamos National Laboratory
Los Alamos, New Mexico
1/84

Cost of astronomy in Chile

In reply to the news report that appeared in October (page 45) under the title "Observing in the high Andes with dollars, planes and bugs," we would like to point out the following:

The statement "while Cerro Tololo's current annual budget is $6.4 million, ESO spends nearly $4 for every $1 at the US observatory, according to NSF accounts" is unfortunately totally false. Actually, the total contribution to ESO in 1983 by its eight member countries was $16 million, of which $8 million are used for running the La Silla observatory, with the remainder serving to finance the European Center for Scientific Research, technological development, image processing and so on. With more than twice the number of telescopes as at Cerro Tololo—including a 3.6-m, a 2.2-m, three 1.5-m and three 1.0-m telescopes—the comparison of cost figures does not seem particularly unfavorable.

We regret that a colleague whom we have held in great esteem has been quoted in your journal as having made the ludricrous statements you report-

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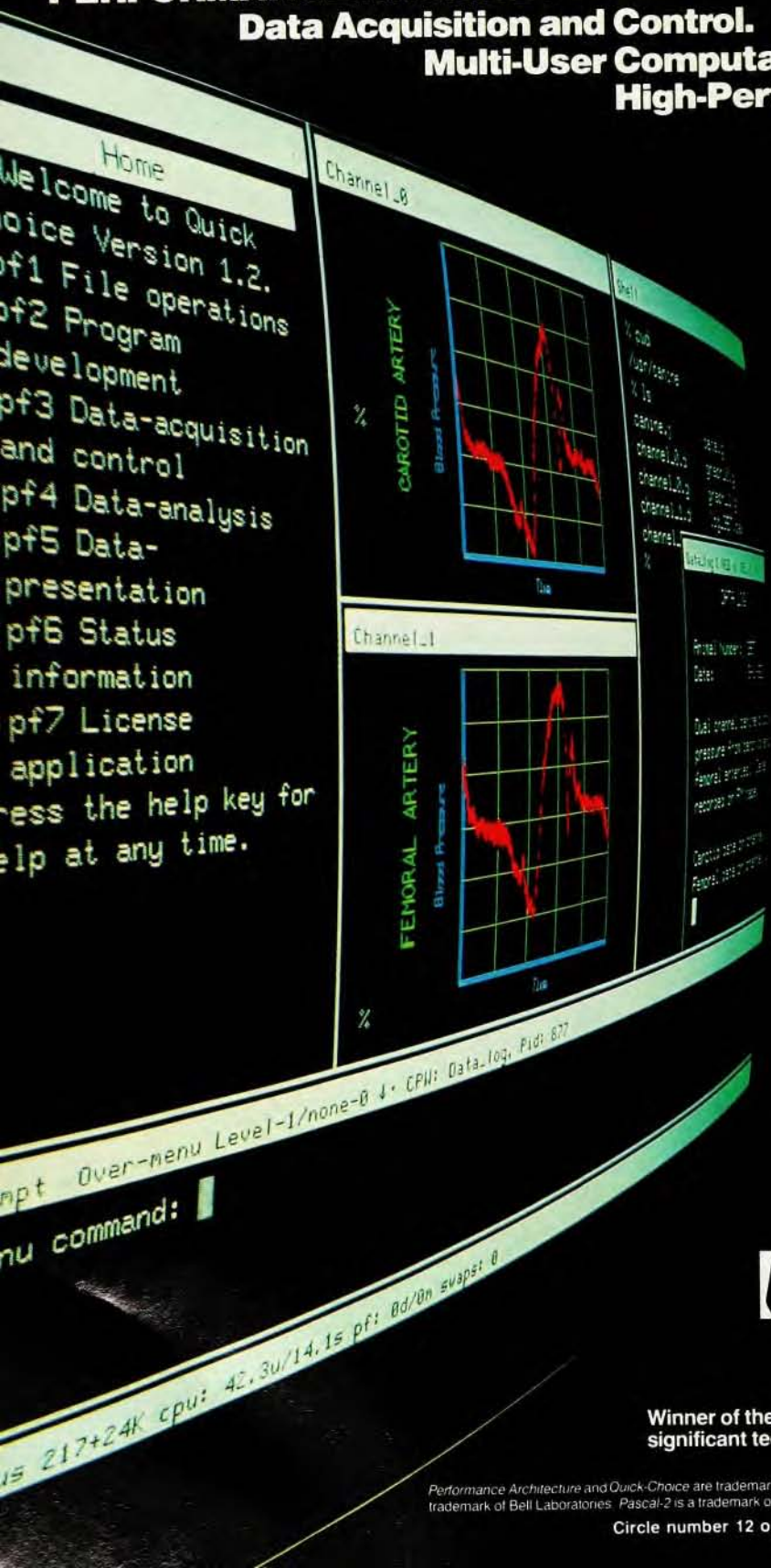

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ed. Of course, the misunderstanding is not surprising if "NSF accounts" are used as a source of information about European organizations. For our part, we shall continue to fly the "twin-engine, eight-passender de Havilland" as a cost-effective replacement for a nine-hour drive from Santiago. US astronomers visiting the American observatories in Chile will continue to be welcome to use seats on the plane when space permits.

L. WOLTJER
Director General
10/83 *European Southern Observatory*

•

Your comparison between the spending of the Cerro Tololo and La Silla (ESO) observatories in Chile was highly inaccurate. The annual contributions of the member countries to the budget of the European Southern Observatory have totalled a constant DM 32.5 million (roughly $12 million, rather than the $25 million suggested in your article) for the last four years. This budget includes operations at ESO Headquarters in Garching (Germany). Apart from providing the necessary support for the observatory in Chile, Garching is a major research facility in its own right. It plays an ever-increasing role in fostering cooperation between European astronomers, by providing, for example, free access to plate measuring devices and image-reduction facilities (ESO will also host the European Coordinating Facility for the Space Telescope). In addition, what you describe as "a cluster of slightly smaller telescopes" is in reality an impressive array of 13 fully operational telescopes with a total collecting area well in excess of that of the telescopes at Cerro Tololo. All ESO telescopes are heavily oversubscribed, but observers on the hundreds of research proposals who are allotted telescope time every year get their trip from Europe paid for, all from the budget mentioned above. And yes, this includes the three-hundred-mile air trip from Santiago to the observatory in a chartered (and cramped) Cessna 402 (not a de Havilland); transportation on the mountain is in Renault 4s, a utility vehicle not imported in the US.

You wrongly cited the ESO as a prime example of the high cost of scientific research in Europe. In reality, ESO provides a high-quality observing facilities in a very cost-effective manner.

JAN KOORNNEEF
Space Telescope Science Institute
11/83 *Baltimore, Maryland*

•

The brief column "Observing in the High Andes" is remarkable for its density of inaccuracy and misinformation:

► The plane leased by the European Southern Observatory is used to transport astronomers 600 km from Santiago to the foot of their site at La Silla. Cerro Tololo's Volkswagens are used solely for transportation *on the mountain*. In fact, most CTIO visitors travel from Santiago to La Serena by public bus (6–7 hours), which is more economical than flying, but also more tiring and time-consuming. CTIO also offers visitors the option of making the trip via domestic airlines.

► The name "Mayall" given to the Kitt Peak 4-meter telescope honors a former KPNO director. The Cerro Tololo 4-meter has no honorary name at this time.

► During eight years in Chile, I never heard any Chilean call anything "astronomy ridge." La Silla is located 180 km northeast of La Serena while Cerro Tololo is 80 km east. ESO operates 13 telescopes on La Silla, while CTIO operates 7. The largest ESO instrument is a 3.6-meter; the others are larger than or equal to their CTIO counterparts in size . . .

NOLAN R. WALBORN
12/83 *Greenbelt, Maryland*

Negative reaction

I grit my teeth when I read "Negative impact of computers" (October, page 121).

If a computer is dropped on a physicist's foot, that is an impact. If time is reversed and the physicist says "!hcuO," I might consider it a negative impact. Otherwise it is an *adverse effect*.

ROBERT ERCK
Argonne National Laboratory
10/82 *Argonne, Illinois*

Change in language

Physicists use models to represent systems of observables; human language is also an abstract model whose formal rules represent some conceptual structure. As I do not expect people arbitrarily to change axioms in current mathematical models, I was distressed when reviewing the page proofs of an article which will appear soon in *The Physical Review* to discover that, twice, the first word of an independent clause following a colon had been capitalized by the editors. They confirmed in response to my telephone call that this had been done "for stylistic reasons." Language changes and evolves, to be sure, but whatever advantage the editors see in their decision is misguided, I

continued on page 135

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