

science can coalesce. (Let us trust our intelligence and worry about how to divide the pie later.) Third, knowing the world is competitive, the assumption that the flexible term "per capita rate" will take off on an upward trajectory among the global economic powers is not an unreasonable one. Thus this approach will save us much repetitive work.

As is always the case for an unpolished idea, this alternative may also have its simplistic shortcomings and undoubtedly suffers from a lack of sophistication. However, as in most human enterprises, the first small step is often the most important one, despite the usual groping, staggering and occasional self-doubts.

WILLIAM LIU

University of Alberta

5/91 *Edmonton, Alberta, Canada*

An Issue of Neglect for Astronomy?

It was with great anticipation that I opened my April 1991 copy of *PHYSICS TODAY*, but my heart was filled with great sadness as I scanned the table of contents. Why, with many distinguished women astronomers and astrophysicists out there, were women not represented among the authors in this special issue on astronomy and astrophysics?

I do not know how articles are chosen for such an issue. Surely some of them must be solicited from the authors, and perhaps some women were asked to contribute to the issue and did not. If the latter is true, then I must fault those women, but I strongly suspect that none were asked.

Time and again I have seen statements from The American Physical Society and the American Astronomical Society, member societies of the American Institute of Physics, that more women must be encouraged to consider careers in physics or astronomy. But where are their role models in *PHYSICS TODAY*?

The very fine PBS program "The Astronomers" prominently features some of our brightest and best women working on the cutting edge of science. What a fine example PBS is setting for young women in our secondary schools. But *PHYSICS TODAY* continues to fail in this respect.

The *New York Times* has a "critics' choice" once a week featuring young successful people in the arts. Why doesn't AIP follow this example? Praise need not be limited to young female physicists, but they are certainly out there among the young

men. We need to encourage all talented people to pursue careers in the physical sciences.

SHIRLEY W. HARRISON

Nassau Community College

Garden City, New York

5/91

A glance at the April 1991 issue confirms the feeling of most solar physicists that we are the Kurds of astronomy. It is a pity you could not devote a little space to the rich scientific problems of our very own star.

HAROLD ZIRIN

California Institute of Technology

Pasadena, California

5/91

THE GUEST EDITOR OF THE APRIL 1991 ISSUE REPLIES: Astronomy and astrophysics have profited enormously from both recent and historical research contributions of women. Those of us who helped to organize the astronomy and astrophysics decade survey, from whose committee members the authors of the April 1991 issue were drawn, tried to include women at the highest levels. We were moderately successful. Eight percent of the members over 40 of the American Astronomical Society are women, while women constitute 11% of the total membership of the society. The percentage of women among the panelists of the decade survey was almost exactly halfway between these two numbers, namely, 9.5%. There were 2 women among the 30 panel chairs and members of the executive committee. As Shirley W. Harrison might have guessed, some very distinguished women astronomers declined to serve either as panel chairs or on the executive committee because of other commitments. When we presented the results of our study to the media, two of the five speakers were women, and when we described the recommendations in a symposium at the National Academy of Sciences, one of the five speakers was a woman.

Astronomy of the Sun is mentioned or discussed on five of the seven pages of my summary of the astronomy decade survey in the April 1991 issue (page 24). Two of the 14 outstanding achievements of the previous decade listed in the summary refer to solar astronomy, helioseismology (carried out with superb precision at Harold Zirin's Big Bear Solar Observatory) and solar-neutrino experiments.

The editor of *PHYSICS TODAY*—a widely respected female physicist—and I jointly selected the topics and authors for the April 1991 issue, based on what we believed to be of

most interest to the magazine's readers.

JOHN N. BAHCALL

Institute for Advanced Study

Princeton, New Jersey

8/91

Theory Lack Shouldn't Prevent Publication

Philip W. Anderson has read my inmost thoughts! Although he refers to solid-state physics in his Reference Frame column "Solid-State Experimentalists: Theory Should Be on Tap, Not on Top" (September 1990, page 9), one thing he writes applies in general to most fields of physics, and most certainly to my field of experimental plasma physics: "Much more serious is the distortion of priorities, of communication and of the refereeing process that occurs when excessive weight is given to theoretical interpretation. We don't want to lose sight of the fundamental fact that the most important experimental results are precisely those that do *not* have a theoretical interpretation."

In spite of being an experimentalist, until recently I was (for 17 years) a member of an institute for theoretical physics. I often tried in vain to inculcate in my colleagues there the understanding that physics is not only (mathematical) theory but that there are such things as phenomenological models, which an experimentalist has to develop at first, simply as a strategy.

Let us assume you find during experimentation that a phenomenon that has been known for a long time suddenly shows some new features that disagree with the hitherto applied and generally accepted theory. This theory may have rested on a number of simplifying, even incorrect, insufficient or inapplicable assumptions that are at odds with the experimental arrangement. Of course this fact was also known to other scientists who had investigated the phenomenon, but some of them preferred to ignore it, since a number of experimental data agreed quite well with the theory.

In view of your new results you are forced to reconsider the old theory, and you develop a new, phenomenological model capable of explaining them. Of course you try to find a theorist who has time and interest enough to develop a new theoretical model. However, in view of the complexity of the system this will keep your theoretical colleague busy for several years. But in the meantime you want to publish proudly the results of your experiments together