

PhD physicist do such work would be of value either to the physicist or to society? He mentions the cost that society has incurred in educating a man to the level of a PhD. That man has also incurred some costs in time, effort and lost income. Both he and society are entitled to the return that can be had only if he can do the work he was trained for.

I am particularly concerned by the implication that the editorial is speaking for society to young PhDs. Society will render its own judgment on the need for physicists; *PHYSICS TODAY* can not presume to speak for it. What it can do is offer something more constructive to those of us about to enter the profession than the chilling thought that unemployment is the price of freedom. Other professions find it not only possible but desirable for their publications to speak for them as well as to them. Like it or not, others will regard *PHYSICS TODAY* as a voice of the physics profession in any case. If we continue to present ourselves as martyrs to our work, totally unconcerned about our position, reputation or security, society will treat us that way, and we will have only ourselves to blame.

ROBERT LEVINE
University of Pennsylvania

Who accepts responsibility?

I am aghast that R. Hobart Ellis Jr could take such an irresponsible position in the June editorial, "Who Finds the Job?" His primary attitude seems to be (correct me if I err in my interpretation) that competent physicists who cannot find jobs within physics should leave and undertake other vocations (he suggests specifically high-school teaching, the Peace Corps and advising the poor and underprivileged). Furthermore he suggests that the universities and the American Institute of Physics have no responsibility for the physicist after graduation beyond providing employment data and job placement services.

My position, as a graduate student, is this: If colleges and universities throughout this country are preparing thousands of physicists only to face careers in some other field, they are propagating a cruel joke. Do not misunderstand me on this point. I am not knocking the Peace Corps or high-school teachers or any other worthy

occupation Ellis would suggest. I am merely stating that I have not *chosen* any of these avenues as a career and I do not care to be *forced* to choose them. I am not asking for a hand-out when I graduate. I simply want to find a productive job within physics.

I can not offer any concrete proposals to alleviate the present situation except to suggest that Ellis's attitude of passive acceptance is precisely what is *not* needed. I sincerely hope that Ellis's position does not represent the official attitude of AIP. After encouraging students to major in and study physics, I feel that it would be inherently dishonest for AIP to turn around and disown them after they graduate and can not find a job. I certainly could not support a professional society that is not interested in the welfare of its members.

WILLIAM M. GREENBERG
San Diego State College

How far to quasar?

I am sure that Fred Hoyle and Geoffrey Burbidge would not wish to take the entire discredit of being the *only* devil's advocates in the matter of quasar distances as suggested in Bernard Burke's excellent article on radio telescopes (*PHYSICS TODAY*, July, page 54). A good part of the opprobrium for suggesting that quasars may be at less than cosmological distance must rest on me (J. Terrell, *Science* 145, 918, 1964; 154, 1281, 1966; 156, 265, 1967; *Astrophys. J.* 147, 827, 1967; *Science* 159, 291, 1968; *Phys. Rev. Lett.* 21, 637, 1968).

The question of quasar distance is still open as there are a number of puzzling observations apparently inconsistent with cosmological distance, such as anisotropy of quasar distribution, apparent cutoff of red shifts at $z \approx 2.4$ (z = change of wavelength divided by laboratory wavelength) and lack of association with distant galaxies. Origin of the observed quasars in a gravitational collapse at the center of our galaxy would appear to be more consistent with these and other observations. JAMES TERRELL

Los Alamos Scientific Laboratory

Subjective relativity

The February article in *PHYSICS TODAY*, "Space, Time and Elementary Interactions in Relativity" by Mendel Sachs, is certainly a most valuable report on modern developments in rela-

We Measure Radiant Energy...



NOW DIGITALLY MEASURE UV TO FAR IR

Model 202 Infrared Radiometer

- ☐ Stable, flat response, **black body thermopile detector** with a one cm²x one steradian total effective field of view
- ☐ Readout in **watts, watts per cm² or watts per cm² per steradian**
- ☐ Automatically ranges from 10⁻⁷ watts resolution to 10⁻¹ full scale with provision for higher range levels
- ☐ Fixed absolute measurements or variable gain
- ☐ Optional filters, shutters and irises maintained at thermopile temperature to maximize stability
- ☐ Thermally floating thermopile housing eliminates the effect of ambient temperature changes.

In Addition...

- ☐ Automatic ranging over **many orders of magnitude**
- ☐ Unique, **simplified, digital data** presentation
- ☐ **BCD 1-2-4-8** and linear analog outputs (logarithmic optional) over the entire dynamic range
- ☐ **Precalibrated**, interchangeable, plug-in sensing heads
- ☐ Remote function programming capability
- ☐ Selectable fast or slow response
- ☐ Hold range and hold reading controls
- ☐ Silicon solid-state design incorporating integrated circuits
- ☐ 0.05% range calibration resistors.

Cintra

440 LOGUE AVENUE
MOUNTAIN VIEW, CA. 94040
(415) 969-9230

ACCURATE DIGITAL RADIATION
MEASUREMENTS — THERMAL •
INFRARED • VISIBLE • ULTRAVIOLET