

## WITH PHYSICS IN TRANSITION, ISSUES OF SUPPLY AND DEMAND MUST BE FACED

Among the topics mentioned in the recent discussion "Roundtable: Physics in Transition" (February, page 36) was the "problems young people face in starting their careers in science," a point we would like to echo. Briefly, we are all postdoctoral researchers in nuclear theory at national laboratories or major research universities who received our degrees under advisers (who are themselves leaders in the nuclear physics community) who encouraged us to continue in academic physics, and we each have at least one or two postdoctoral positions under our belts. Despite our track records we have had no success in finding permanent positions. In fact, we have to look very hard among our peers to find someone who has even been interviewed for a faculty job. Furthermore these difficulties are not unique to nuclear theory but, from our observations, are pandemic in physics.

Given this state of affairs we feel compelled to offer an analysis of the job market from the perspective of struggling young scientists. To begin, we break our job "opportunities" into three categories:

▷ *Research-level academic positions.* The chances of obtaining these positions in an era of shrinking Federal research budgets have always been slim. Recently, however, this dearth of suitable positions has been exacerbated by the focus of many available jobs on very specific sub-specialties within nuclear physics and by the significant number of more senior physicists (that is, those who already have faculty jobs) who are looking to move. This latter development is particularly disturbing, since it suggests that the positions they held either were unsatisfactory or did not offer real job security.

The suggestion made in the roundtable discussion that young physicists consider branching out into nontraditional areas such as biophysics or mesoscopic physics is appealing but unrealistic. Even if the freedom

to explore these options were available to young researchers in the current system, there are no more jobs in those fields than anywhere else. In fact we know of no division or subfield of physics, traditional or otherwise, where the supply of jobs exceeds the number of qualified applicants.

▷ *Industrial research.* For many years the conventional justification for pursuing a physics education in spite of the general dim prospects of obtaining an academic position was the notion that the skills acquired along the way would allow one to compete successfully with graduates from other scientific and engineering fields for industrial positions. This rationale suffers to a large degree from the same prejudice, namely that physicists are somehow "smarter" than graduates from other fields, that leads the roundtable participants to accuse young physicists of "disdain" for industry. From our perspective there is no shortage of young physicists willing to take these jobs but rather, with the defense build-down and the economic squeeze on electronics and other industries, a shortage of jobs for us to take.

▷ *Teaching positions.* Finally, teaching, at least at the college or university level, does not present much of an option either, particularly for young people like ourselves, who were encouraged along a research track. The positions advertised at teaching colleges typically have several hundred applicants and are often aimed at experimentalists, particularly in fields such as condensed matter, which are perceived to provide a greater opportunity for on-campus undergraduate research. Once on the research track, it is extremely difficult for a young scientist to acquire the teaching experience required to compete for these jobs.

Contrary to what was implied in the roundtable discussion, we don't want to be clones of our advisers: We

would love the opportunity to branch out into new fields of research or application and would like very much to contribute to both physics and society. Unfortunately, the real opportunities today range from limited to nonexistent, and the situation is, as Albert Libchaber noted in that discussion, quite depressing.

CHARLES BENESH  
CALVIN JOHNSON

*Los Alamos National Laboratory  
Los Alamos, New Mexico*

MAURICE AUFDERHEIDE

*Lawrence Livermore National Laboratory  
Livermore, California*

ERICH ORMAND

*California Institute of Technology  
Pasadena, California*

4/93

It was very interesting to read about the views of some of our influential colleagues in the roundtable discussion "Physics in Transition." I think some of the participants correctly identified the difficulties recent graduates have in getting permanent positions and the lack of research funding as some of the most serious problems that are facing physicists now and that will face them in the near future.

It is extremely disappointing, though, that most of the roundtable participants still advocate attracting more people into physics and into science in general. I wonder if they have ever heard of supply and demand in economics. We in California certainly know the consequences of having an oversupply of scientists and engineers in a shrinking job market. With the projected decrease in research funding and job opportunities, wouldn't it be sensible to reduce the number of physicists (and other scientists and engineers) being trained so as not to increase competition unnecessarily and, more importantly, to enable people who would otherwise be prospective physicists to go into professions that have brighter futures? To those people who are concerned about there not being

## LETTERS

enough physicists to fill vacant positions, I would point out that the signs are that that is not going to happen anytime soon, and if it *does* happen it might not be a bad thing either, because we would then be in a better bargaining position to improve our working conditions. In a capitalist system like ours, adjustment by supply and demand sounds logical and rather trivial.

So why can't our physics leaders see it? Their views appear to be rather puzzling at first. Note, however, that all the roundtable participants are senior members of the profession who are either tenured professors or have good, secure positions. Encouraging more students to go into physics increases the supply of cheap labor that would enable their own groups to obtain more research funding and increases membership in their community, with all its trimmings (for them). It is therefore unrealistic to expect them to look after the interests of the junior members. Until the situation improves I am afraid younger physicists will have to get together themselves to ensure the continuity and future prosperity of the physics profession.

V. K. YEE

3/93

Arcadia, California

I have read about and partaken in many discussions regarding the current increased difficulty in obtaining funding and its effect on the job satisfaction of academic scientists. There is general agreement about this increased difficulty, yet funding in constant dollars has, if anything, risen. Little attention has been paid in Leon Lederman's article "Science: The End of the Frontier?" (published in January 1991 as a supplement to *Science*), the roundtable discussions in *PHYSICS TODAY* or my own conversations to explaining this apparent paradox.

One possibility lies with the demand—more scientists are competing for the same piece of the pie. A trend of increasing levels of research has occurred in the last ten years at many colleges and small universities. Faculty at more liberal arts colleges are now expected to establish rigorous research programs, where once they put all their energy into educating students. As the supply-to-demand ratio for science faculty has increased, small universities have been able and have chosen to hire faculty with stronger research programs than those faculty being replaced; research provides both prestige and financial support for these universities. This process,

however, increases the net demand for funding resources.

I believe in the current economic climate we should neither ask for nor receive increased funding levels to satisfy a growing demand for research resources. Perhaps we ought to address how to best balance our own demand with the given supply.

BENJAMIN R. COWEN

University of Pennsylvania  
Philadelphia, Pennsylvania

3/93

As a young physics postdoc in academia, I would like to offer my impression of the roundtable discussion that was featured in the February issue of *PHYSICS TODAY*:

I am a deck hand on a supertanker. An enormous iceberg has been sighted and we are headed straight for it. The captain and his officers are frantically discussing what to do about it. The crew, however, are looking for the lifeboats, because they know that supertankers cannot be turned on a dime.

GANES KA-SHU WONG

California Institute of Technology  
Pasadena, California

3/93

"Roundtable: Physics in Transition" missed the important point that it is physicists themselves who are in transition.

They are in transition to poverty.

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PETER DUNCAN

Walnut Creek, California

3/93

## Investment Climate Stunts Tech Transfer

Over the last 12 years an attitude has been fostered and championed in this country that the best use of investments is measured solely by the return on investment. This argument has been used to suggest that taxing rich investors, particularly those whose returns were the highest, is bad, because it takes money from people who obviously know the most about doing what's good for the country, as measured by all the money they are making, and gives it to people who are economic failures,

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212-983-6745, e-mail:  
mulligan@pinet.aip.org.

