

letters

Will the other countries of the world take a cue even now and do something about the lot of their teachers and restore the dignity of teaching as a profession? In my considered opinion, it is the fundamental right of a person to opt for teaching and/or research, and it is the bounden duty of university administrators to evolve guidelines to reward teachers and researchers on their own merits, but not one at the expense of the other.

S. V. PAPPU

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11/23/77

The Tale of Schrödinger's Cat

Schrödinger called his cat and said,
"You can be both alive and dead,
For a linear combination of states
Postulates two simultaneous fates."

Poor shocked pussy could not say,
"I shall inform the SPCA.
Your pet theory seems to me
An ultraviolet catastrophe."

What then did his kitty do?
She looked at him and said "μ."

M. KOCHER

Corvallis, Oregon

10⁻³ mistake

The first figure and caption of the article "Critical-point Universality and Fluids," by Anneke Levelt Sengers, Robert Hocken and Jan V. Sengers in the December issue, truly took away my breath. That such a complicated seven-layered thermostat is capable of only 20 mK temperature control seems an unsurpassed feat of un-design. Or may somebody along the line have been unaware of the difference between m (milli-), standing for 10⁻³, and μ (micro-), standing for 10⁻⁶?

ANNEKE LEVELT SENGERS
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1/19/78

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Einstein unemployable today

With the recent discoveries of J and upsilon particles, many new quarks and gluons have now been postulated but none of them has yet been observed. The situation has prompted Martin Perl to call for a new Albert Einstein at the recent APS meeting in San Francisco. A similar call has also been made by the director of Fermilab.

However, with our present emphasis on research programs, it is quite possible that Einstein could not survive today. He would have great difficulty formulating a research program involving relativity, the

photoelectric effect and Brownian motion simultaneously. Indeed, it would be almost impossible for him to justify the coherence of such a research program. Paradoxically, his accomplishment was less impressive when he did have a well-planned and comprehensive research program in unified field theory.

With high unemployment (9% in 1974, 13% in 1975) among new graduates, employes can afford to be very choosy. With very scientific matchings of candidates and jobs by computers, young physicists often must work along the lines of their thesis research. Under present conditions, J. Willard Gibbs would be forced to work on "the form of the teeth of wheels in spur gearing" forever, and Ernest Lawrence on the photoelectric effect of metal vapors. If these events had occurred, the losses to physics would be very grave indeed. Under present conditions, Einstein would not qualify for his patent-office job, and would be denied financial security even at a very modest level. According to Banesh Hoffmann,¹ Haller (the director of the Swiss Patent Office at Bern) called Einstein for an interview, which quickly revealed Einstein's lack of relevant technical qualifications; but as the interview continued its gruelling two-hour course, Haller began to realize that there was something about this young man that transcended technicalities.

We all recognize the importance of scientific planning in research. There are many outstanding successes of well-organized research programs, such as the search for transuranium elements following the discovery of neptunium and plutonium during the Manhattan Project and the biological code research following the experiments with cell-free systems. (However, the search for biological codons was finished after only three years, 1961-64). At the same time, there is also the real danger of over-planning and overly scientific research programs, leading to the tendency of putting the same problem on a slightly bigger computer for a slightly more accurate answer.

In some respects, perfection and obsolescence may be regarded as complementary variables in the Heisenberg uncertainty principle. There are examples where a perfect weapon is also an obsolete weapon. The most powerful and most heavily protected battleships, *Yamato* and *Musashi* of the Imperial Japanese Navy, never accomplished much. Similarly, a perfect research program may also be an obsolete program. According to Lessing,² it does not follow that big creative breakthroughs are made by the big budgets and the big research staffs. For example, xerography came out of the home workshop of a patent lawyer, not from the duplicating machine industry. Let us remember that bureaucracy can

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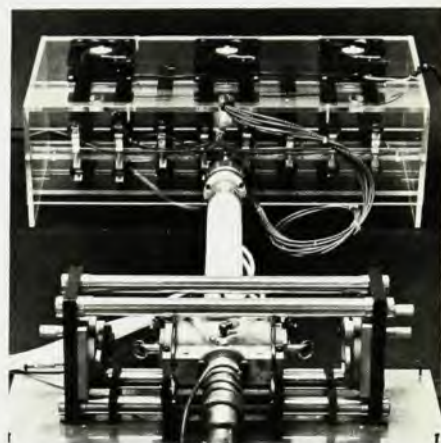
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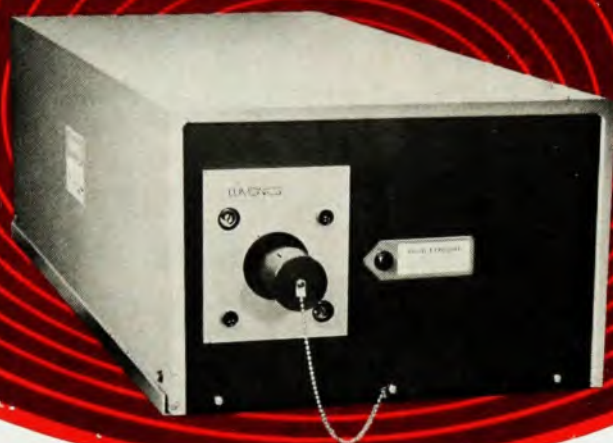
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stifle the US research community, and too much management can be as bad as too little management!

References

1. B. Hoffmann, *Albert Einstein, Creator and Rebel*, Viking, New York (1972), page 34.
2. L. Lessing, *Fortune*, April 1972, page 69.

T. TSANG

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2/17/78

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No prejudice against women

I think Alice Macnow's comments (November, page 11) on William Fowler's article to the effect that "Physicists are always imagined as men" is a bit unfair to him. Fowler was recalling *his* acquaintances at Caltech. That school didn't begin admitting women as *graduate* students until the late 1950's. It was even later that things opened up for women undergraduates. As he said, his was a *personal* view of things. I was a student in Engineering Science when there were only six women on campus. Fowler would only have known one of us at that time—Virginia Trimble—and she was in Astronomy.

Let's put this women's lib thing in perspective. The physics department at Caltech has no observable prejudice against women.

LOUISE GRAY YOUNG

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1/6/78

College Station, Texas

World oxygen supply

With regard to Yale Jay Lubkin's letter in January (page 87), I strongly disagree with his unusual comment that "there are vast acreages of useless jungle all over the Third World." Where does Lubkin think the world's oxygen comes from? Let him keep his suicidal ideas on an individual scale.

ART J. NELSON

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1/31/78

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THE AUTHOR COMMENTS: If one were to take the question raised by Nelson seriously, one would note:

The jungle acreage of Brazil is about 10⁹ acres. At 100 tons of biomass per acre per year, which is not difficult to obtain, the total Brazilian jungle biomass is 10¹¹ tons/year, which could produce 2 x 10¹¹ barrels of alcohol per year. World petroleum production is of the order of 10¹⁰ barrels per year, so that 5–10% of the Brazilian jungle, by itself, could replace all of the petroleum now used. This is a very small portion of the Earth's annual biomass production.