

letters

esting one with potentially profound implications in the future. The question is, how far in the future—is there really a need for a tape depository now? AIP would be very interested to hear from other physicists who see a need for this type of depository, particularly those who might use deposits as opposed to making deposits.

The present PAPS depository is accumulating at the rate of about four or five deposits per month. The majority are indeed computer-generated tabular data. But whether such data would or could be used as part of the input to other physicists' computer programs, or directly to "look up" particular values, is perhaps not obvious. Besides, a substantial number of the deposits are in categories such as extensive details of mathematical proofs, detailed descriptions of experimental apparatus and procedures, and so on. The rate at which copies of deposits are presently being ordered by users is about 10 to 20% of the deposit rate.

Mirman and Schindler mention some of the technical questions that would have to be settled in creating a tape depository. There are also problems with the long-term security and integrity of tape archives. And, of course, there is the cost factor. In principle PAPS could be used as a depository for any reproducible materials, and the question of a computer-tape depository will be brought before AIP's Publications Board (the editors of all the journals published by AIP).

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12/22/77 New York, New York

Request for help

We have recently formed a small department specializing in solid-state physics. We badly need journals, books and equipment. Donations, as well as low-priced offers, would be most welcome. Please write to: Coordinador, Depto. de Fisica, Instituto de Ciencias de la Universidad Autonoma de Puebla, Apdo. Postal J-48, Puebla, Pue. Mexico.

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More recognition of teachers

It is about time that the problem of recognition for teaching is faced squarely, and I am happy to see the letter by M. A. Ijaz in these columns on this very important subject (August, page 11). Lack of interest on the part of university administrators to evolve any kind of guidelines

to recognize teaching is a universal disease which is crippling the field of education not only in the US but in the entire world. Having a long tail by way of publications, however mediocre they may be, has become a *sine qua non* condition for getting promotions for faculty in all disciplines, not just in physics. A clever person gets this tail to be very long by publishing the same material as a letter, a paper at a conference, an internal report and finally as a review or a chapter in a book, if luck favors him. Of course, a dedicated researcher will never stoop to doing such things, just as a dedicated teacher will never stop updating his lecture notes. But, then, both species are fast becoming rarer commodities these days, but for entirely different reasons. A dedicated research scientist is forced to abandon his chosen path of intellectual pursuit because the system under which he functions requires that he beat his drum as loud and as fast as he can to catch the eyes of the powers that be. On the other hand a dedicated teacher abandons his chosen path because it has become a pathological obsession with university administrators to ignore teaching and to recognize mediocre research output as something desirable.

When such is the situation in the developed nations, what can one say about developing nations that unwittingly or deliberately choose to ape the methodologies of the developed nations? While the developing nations are in step now with the so-called developed nations in so far as ignoring teachers is concerned, they have gone one step further (like adding insult to injury) by discriminating amongst researchers. For example in some countries university authorities ask their faculty to indicate the number of papers published in foreign journals in contrast to the local journals, and the weight is always in favor of publications in foreign journals. Of course they are perpetrating this slavish attitude under the guise that "science is international."

Swami Vivekananda, a pragmatic-saint of Old India, has summed up the value of the student-teacher interaction as follows: "One should live from his very boyhood with one whose character is like a blazing fire and should have before him a living example of the highest teaching." The basic tenet of the old Indian educational system was the recognition of teacher as equal to God. It is a pity that India, which has established laudable traditions in recognizing the value of its teachers to the development of its society, is fast slipping in its mad rush to catch up with the so-called developed nations. I should say we really have caught up, because in India also, these days, a mediocre research scientist is considered superior to even the best teacher.

And now we are hearing voices from the developed nations such as the US protesting the injustice done to its teachers.

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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

Indian Institute of Science
Bangalore, India

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

National Bureau of Standards

1/19/78

Washington, D.C.

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, employees 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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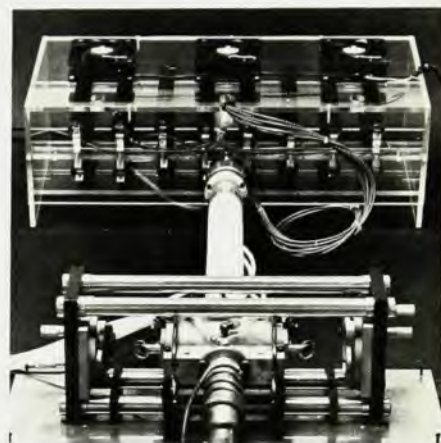
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