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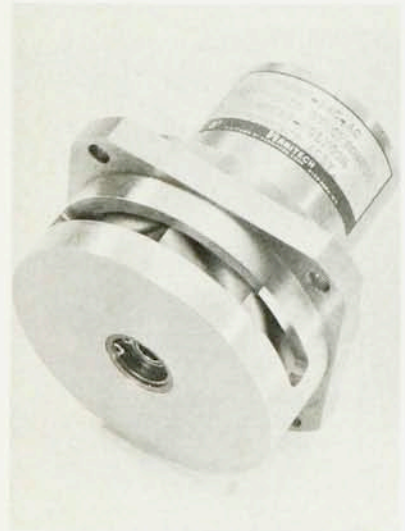
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letters

were a lecturer in chemistry, Mohammad Saleem, and Tariq Ahsan, lecturer in political science. Information from AI indicates that these scientists were only expressing themselves freely. AI further reports that since their arrests in November 1981, they have been tortured by the authorities. AI requests that letters on behalf of these individuals be written by fellow professionals and academicians to indicate their deep concern for the treatment of persons incarcerated for the simple act of self-expression. Therefore, I urge the readers of PHYSICS TODAY to write to one or both of the following individuals expressing their concern for the prisoners, and urging their release from custody: Mohamed Ali Khan, Minister of Education, Islamabad, Pakistan; Zafar-ul-Haq, Minister of Information and Broadcasting, Islamabad, Pakistan.

I may note that AI has adopted these persons as prisoners of conscience and is urging a letter-writing campaign on their behalf.

EMILE RUTNER
Dayton, Ohio

11/82

Should God save the Queen?

In regard to our letter concerning the frustration of physicists (April, page 89), the response by Robert Bell (August, page 78) is rather amazing. He readily admits his ignorance of the subject, but this very fact does not seem to prevent him from judging us. Perhaps it was the page number "89" which incensed him by induced association with the 1789 French revolution! In any case, the strong point of his letter is an aggressive verse of the British national anthem. In other words, to speak subjectively about physicists is for Bell a direct aggression against the foundations of the "Royal Order." What a nice illustration of the spectacular power produced by physics, like a "church of natural order." Who would then think to accuse its "priests" of frustration? From the opposing viewpoint we say that research is not devine. It is the result of human activity which, by definition, is subjective. The gap between objectivity and subjectivity in science is not as large as people would like to believe. If it is true that the word frustration has had historically various meanings as quoted by Bell, the Freudian one is actually the most commonly used. Moreover, from the physical situation where the word frustration is used, it is evident that the underlying meaning is the Freudian one.

To pursue our "knaveish tricks" let us talk about "chaos" in physics. The

wide interest concerning frustrated objects has now moved toward "chaos." This is indicated by the increasing number of "chaotic" publications on the subject. First introduced in mathematics, the concept and study of chaos is spreading to various fields of physics, in particular to condensed matter (localization, spin glass, phase transitions) and hydrodynamics (instability, turbulence). It is only a beginning. The actual "chaos" in the western world compels one to look for a link between the sudden interest of physicists for chaos and the confrontation of society to the uncertain future of the world. The two basic approaches to chaos in life also exist among physicists: the optimistic one of those who look for "order" in "chaos" and the pessimistic one of others who see "chaos" in "order." This whole *état de fait* leads us to perceive physicists as a reflection of society. Through the problems they study, they would in fact express collective social anxieties. This is only our hypothesis, and we would like to hear other opinions.

SERGE GALAM
City of College of New York
New York, New York

PIERRE PFEUTY
Centre d'Orsay
Orsay, France

11/82

PhD a must for teaching?

Is the PhD degree necessary for college physics teaching? If so, why? If not, what degree is necessary?

First, let's consider the nature of the PhD itself. This degree indicates two things (at a respectable institution): the recipient has successfully demonstrated an advanced knowledge of physics, and he has completed research of a quality which is publishable in refereed journals. However, it indicates nothing about his teaching ability.

Second, let's consider the nature of four college physics teaching positions: (1) directing graduate research and teaching graduate and undergraduate courses, (2) teaching a full range of undergraduate courses in a four-year institution with release-time given for research, (3) teaching a full range of undergraduate courses in a four-year institution (without release time for research) and (4) teaching general courses in a two-year institution.

Now, let's address the questions raised in the first paragraph. It is clear that a PhD is required for positions 1 and 2, since research is part of the nature of the positions. However, research is not part of the nature of positions 3 and 4, so a PhD is not required—indeed, a research-oriented PhD physicist would find himself frustrated in either of these positions.

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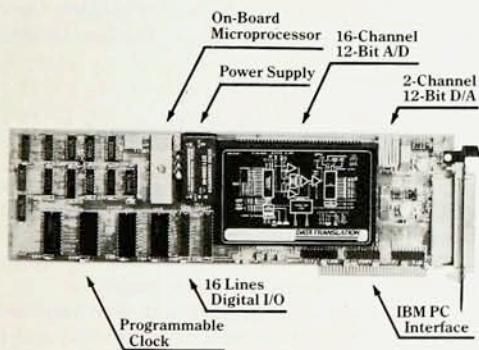
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letters

What is needed for positions 3 and 4 is a physicist who is dedicated to quality teaching rather than to physics research: a master's degree in physics (possibly with some further graduate work) is all that is required for position 3, and a bachelor's degree in physics is all that is required for position 4.

I am writing this letter because it seems to me that many of the descriptions of academic openings call for overqualified candidates which, in the long run, fosters job dissatisfaction. This is especially true of openings for positions 3 and 4; I'm afraid that the imposition of the requirement of a PhD for position 3 or of a MS for position 4 is an artificial grasp for prestige rather than a sincere effort to find the correct candidates for the positions.

BYRON C. HALL JR
Cincinnati, Ohio

11/82

Scientific visit restrictions

I have been working for several years to arrange for a young scientist from Eastern Europe to spend a year or so in my laboratory. Everything was arranged (so I thought) in September 1981 under sponsorship of the International Research Exchange Board (IREX) when the scientist was suddenly withdrawn from nomination, according to IREX. Once again, everything was arranged for October of this year when I received a call from the Department of State for more information on his program before they would issue a visa.

Through a series of conversations with the State Department personnel, I learned that the State Department was the source of the scientist's "withdrawal" in 1981. His visa application was bounced with absolutely no communication with the scientific sponsor, namely me! Second, I was informed that his visa would be granted this time but that his stay in the US should be subject to certain restrictions. I quote edited excerpts from the letter from State:

...I would appreciate it if you would confirm in writing that you would see that the following restrictions are *enforced* during his stay...

1. His research is to be strictly basic and fundamental in nature. He is not to make any visits to industrial facilities, and no visits to the National Bureau of Standards of Boulder, Colorado.
2. His access to unique lab equipment is to be a user only. He is to have no access to design or maintenance information.
3. His access to all information

should be restricted to that which is available in public domain and the results of his research should be available for public dissemination. You are aware, of course, that... should not have access to any unpublished technical data, which might require an export license.

Now, because of my desire to help this scientist to realize this long anticipated visit, I have been reluctantly cooperative with the request from State and have indicated that I will "endeavor" to see that their "guidelines" are followed. At the same time, however, I find these attempted intrusions on the freedom of my visitor rather upsetting. It seems even more incredible that the Department of State would expect me to enforce their request.

It would be useful to know how widespread such requests have become. I would be happy to learn of other experiences by colleagues along these lines.

Fundamental questions also need answers. Are these request legal? Who has enforcement powers? Are host scientists liable to McCarthy-type tactics down the road? What are the limitations on the government's right to interfere with unclassified university research?

CARL E. PATTON
Colorado State University
Fort Collins, Colorado

12/82

Natural-hazard photographs

The National Geophysical Data Center (NGDC) of the US Department of Commerce has collected a file of 2000 natural-hazard photographs, worldwide in scope and covering events that span two centuries. The photographs are accompanied by captions which include the event data; location of earthquake; photograph location, description and source; and quality codes. This file includes approximately 300 volcano photographs, 700 tsunami photographs and 1000 earthquake photographs.

A data-coding system has been used to classify earthquakes and tsunami photographs according to a number of categories, including such things as photo perspective, building damage, structural damage, ground effects and sequential photographs. Damage-specific and event-specific photograph requests can easily be filled.

The photographs are available to the general public for the cost of photo reproduction and processing the orders. Catalogs describing these photographs are available free from NGDC.

Twenty outstanding color slides, available as a subset of the natural-

hazard photograph file, comprise the Earthquake Damage Slide Set. These slides graphically illustrate the geologic effects and damage to man-made structures produced by earthquakes. The slides are 35-mm color transparencies. The complete set depicts the range of geologic effects resulting from major earthquakes and relates the damage to the underlying geologic causes. Since these photographic records show clear-cut evidence of several dynamic geologic processes, the set provides a unique and affordable tool for presentations to technical and non-technical audiences. The slides are accompanied by descriptive captions which include the source of the photograph.

The slides illustrate several kinds of earthquake effects: strike slip and thrust faulting, surface ruptures, landslides, fissuring, slumping and sand boils. Structural damage shown on the slides results from such different effects as seismic vibration, soil liquefaction, slumping and location on a moving fault. Structural damage from adobe construction, masonry infill walls, foundation failure, support-pillar failure, compression and soil composition is illustrated. Transportation systems damaged include railroads and highways. Damaged structures include residences, factories, municipal buildings, apartment houses and schools.

All inquiries should be addressed to the National Geophysical Data Center, NOAA, Code EH11, 325 Broadway, Boulder, CO 80303.

PATRICIA A. LOCKRIDGE
National Geophysical Data Center
Boulder, Colorado

12/82

Breakthrough questioned

I would like to comment on two news stories in November, "New Method for Determining the Phases of Diffracted X-Rays," and the related article on the 1982 Warren award (page 83).

It seems to me that the emphasis given to this topic is completely out of proportion.

The Warren award has been used, in the past, to recognize significant contributions in the field of diffraction physics. Previous Warren awards were given to Bonse and Hart (1970) for their invention of the x-ray interferometer, to Shirane and Axe (1973) for their studies on displacive phase transitions, to Cowley and Iijima for their work in electron microscopy with angstrom resolution, and lately (1979) to Stern, Lytle and Sayers for their contribution to the development of EXAFS (Extended Absorption Fine Structure).

In all of these cases it is easy to