continued from page 15

ty in each area—the AEC in the case of the Reactor Safety Study and the Federal Energy Administration in the case of the Energy Conservation Study.

The Reactor Safety Study is a classic example of the ability of the NSF to provide support for objective policy analysis in a critical and controversial area. We anticipate that the APS study will provide uniquely useful input in the continuing national debate over the conditions necessary if the public is to have assurance that nuclear energy systems have received intensive and independent scrutiny.

The NSF Office of Energy R&D Policy, using the resources of the National Science Foundation, is endeavoring through these grants and through others to develop such independent assessments and analyses in all key areas of energy R&D. Through this process we believe the science advisory function may become increasingly effective in affecting public policy determination.

PAUL P. CRAIG
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Crackpots unite?

As evidenced by Samuel Goudsmit's and Jack Sarfatt's remarks (September, page 9 and page 13) there is a serious problem in physics regarding creative, speculative research. The "establishment" institutions and fashions do undoubtedly discourage it. This has always *been* the case (Galileo, Einstein, and so on), and will always *be* the case!

The answer does not lie, therefore, in kicking the system, or calling conventions to discuss the problem. What we need is a publication outlet for speculative ideas, so they don't die unrecorded, and honest appraisal by the creative individual of his willingness to pay the price of creativity. The first requirement is currently being served very well by the *Foundations of Physics* and the *International Journal of Theoretical Physics*. Don't even try *Physical Review* or *Physical Review Letters!* You only invite ego destruction. By concentrating the speculative papers, we also make it easier for those interested to keep up with the spectrum of current mental wanderings.

The establishment promises glory and honor (hero worship) to anyone who *actually* succeeds in *finding* an important new insight, though it spits on you while you are *trying!* Maybe this is as it should be. If you dare to break out of the mold and commit yourself to unorthodox, unsafe, likely totally unproductive investigations, then you must be prepared to make a living away from the establishment inner circle of theoretical physics. You just can't have both unless you get your PhD at age 16 or 18 (recognized smarts, not creativity). This is why creative contributions are rare in science and other fields as well. You must give up a lot and know that most likely you will not come up with anything of lasting value to basic knowledge.

Perhaps Sarfatt's physics *Ecclaesia* (spiritual community) would give such "deviates" a shoulder to cry on, but I doubt that it would increase their success. They would do better to face the brutal realities of their options and plan accordingly.

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Teaching the deaf

In the October 1973 issue (page 23) there is an interesting article by Arnold Strassenburg, "Preparing Students for Physics Related Jobs." The article effectively makes the point that courses in interdisciplinary areas and more applied research should be included in the academic programs of students of physics.

Prominent in the article was mention of an interdisciplinary program pursued by a student in physics, with an illustration of his work applied to the teaching of deaf children. In the article it is mentioned that at the university where the work was done the interdisciplinary master's degree program has students participate in biology, chemistry, engineering, physiology, and physics.

No mention is made of work being done either in psychology or in the area of communication disorders (to include education of the deaf). It is apparent that if students in physics are to attempt to apply their work to areas of education, psychology, communication disorders and similar fields, a truly interdisciplinary program should include blocks of work in these related areas.

Table 2 of the article indicates that there is enrollment by physics students in areas of education, although to a minor extent in various academic institutions. It is also noticeable in figure 2 of the article that a background in psychology appears to be an area desirable among prospective students by about half of the physics departments.

At my home university, and I believe at others also, there are opportunities for students in physics to pursue studies in other fields. Especially pertinent is work in the behavioral sciences when the physics student wishes to apply his knowledge of physics to educational, communication, or behavioral problems.

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letters

the attention of advisors of students of physics that there is an area of technical competence, of academic endeavor and of related research that should be drawn upon to a much greater extent than at present for students of physics. This is especially so if they wish to be engaged in interdisciplinary academic training, and especially if they wish to make effective application of their fundamental knowledge in fields of physics to the solution of human problems, such as problems in the behavioral and communication sciences. It would be unfortunate for students of physics to delve into these other areas without drawing upon the existing knowledge, expertise, research and facilities in the area of communication disorders usually housed in university programs in speech pathology, audiology and deaf education.

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Impractical engineers

I think P. Tannenbaum brought home the point very nicely about the latent ability of physicists to function as effective problem solvers (March, page 13). I wish to elaborate on his statement: "Armed with this solid foundation and an ability to read and think all physicists can become problem solvers, . . ."

In my opinion there are in this world as many impractical engineers as there are useless (from the point of view of societal needs) physicists. This is especially true in developing countries because of inadequate facilities for training engineers and scientists. In my opinion, in this day and age of energy crisis, environmental pollution, overpopulation and so on, developing countries like India (or for that matter even developed countries) can ill-afford scientists and engineers who are dreamers and non-problem solvers. In the lights of these observations I think that the word "physicists" in Tannenbaum's above-mentioned statement should be replaced by the words "scientists and engineers."

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Correction

October, cover note, page 5: The first sentence should read: An ultrasonic pressure wave probes a perforated steel plate to form a visible image *on a sonosensitive plate.* □