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cists are lacking in mathematical training. I feel, in general, that they have more mathematics than they can use in a practical situation. What concerns myself and any other person in industry is, can they do a job for me, not how much fancy mathematics they can swirl around. The crucial question in the job market is, can they contribute something of economic value, can they make something work, and can they solve a problem? Too many physicists are fascinated to the point of distraction regarding the latest evolution of the spin reaction of something or other, not whether they can be of any economic help to anybody.

JOEL S. SPIRA

Lutron Electronics Company
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Chicago congratulations

I attended the annual APS meeting held in Chicago last week. The Topical Conference on Energy was one of the best attended physics meetings in recent years. I wish to congratulate APS for conducting the Symposium on Problems of Current Interest to Public and Physics Community.

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No Theory in *Phys Rev*

I was somewhat saddened and disappointed by the decision, embodied in a recent announcement by the editor of the *Physical Review* [Phys. Rev. D 8, 357 (1973)], to eliminate or drastically curtail publication of papers regarding "fundamental theories" in that journal. To dispel the idea that I have a direct personal stake in this, let me immediately point out that I am not myself a worker in this particular field.

It is clear certainly that papers on "fundamental theories" should not constitute a very great fraction of the content of the *Physical Review*. However, in moderate quantity, they contribute a refreshing change from the usual working out of yet another aspect or ramification of a fashionable, accepted theory. They serve a useful function in keeping the conventional work honest and on its toes by forcing one to compare the conventional with the more outlandish.

As a side issue to this, and an example of how "outlandish" theories test "conventional" theories, it is amusing to observe the set of criteria the editor has put forward to test prospective papers in fundamental theory. Is it real-

ly true that in a representative paper in the *Physical Review* today the author states "all implied assumptions ... clearly and concisely"? Do all authors of *Physical Review* papers "convincingly show" that their assumptions "explain hitherto unexplained observations," "expose new relations between known data," and that these assumptions are "simpler and fewer than in existing theories"? Do authors show that their assumptions "do not contradict existing experimental facts," and do they "investigate possible new consequences of [their] assumptions and whether these could be tested by new experiments"? These are excellent criteria, but I dare say it is a rare paper indeed that satisfies all of them.

On a deeper philosophical level, philosophers of science, physicists themselves, and others conscious of the practice of physics today have become aware of excesses in the "revolutionary paradigm-normal science" dichotomy introduced by the work of T. S. Kuhn (*The Structure of Scientific Revolution*, U. of Chicago Press, 1962). According to this account, in briefest outline, science progresses by "quantum leaps" during "revolutions" when a new idea (paradigm) is introduced, which becomes universally accepted, and is elaborated, criticized, extended, and generally worked through by the entire scientific community. This is "normal science." It is followed by another revolution, which introduces a new paradigm, more normal science and so on.

This may indeed be the way physics operates, and it may be the most efficient way to gain an understanding of nature. Somehow, however, one doubts it, at least in its most rigid form. There are few revolutions and few revolutionaries. The rest are practitioners of normal science. In the picture presented by this account it is a mystery why an autonomous, creative human being would choose to face the dreary prospect of grinding out some more consequences of someone else's paradigm; it is a wonder there are any "normal scientists" at all.

It is just possible that the "outlandish" papers in fundamental theory may help to break the back of the caricature embodied in this rigid pattern, or at least humanize it somewhat, or give it some spice. On the other hand, the editor's decision is a gesture that tends to support the "paradigm-normal science" pattern, and serves to expel and exclude any variation from it. In particular, by relegating all "unusual" work to journals outside the regular ones such as *Physical Review*, this work is effectively exiled, pushed further out of the mainstream of physics and given even more of a crackpot label. Its salutary qualities are there-