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LETTERS

The team on the path . . .

It was fascinating to read the group of articles on "High Energy Physics" that appeared in the November 1964 issue of *Physics Today*. In particular, the "Round Table Discussion" revealed, quite clearly, present-day attitudes that relate to the recently acquired wealth in the physics community, its distribution, and the relative importance that is assigned to "high-energy physics".

The advantages of our newly acquired nouveau riche status are obvious. On the other hand, there are distinct accompanying dangers that must be guarded against. Some of these were discussed by Dr. Weinberg and some by Dr. Pake. I should like to mention one more by-product that I feel presents a far greater danger to the future of Science than those which were discussed by the panelists. This is the present-day tendency to stifle individuality and freedom of intellectual curiosity in scientific inquiry. With our new status, we have evolved into a scientific community of large *teams* of researchers. The *team* refers here not only to the (necessarily) large groups that are engaged in high-energy experimental physics. It refers, more importantly, to the vast majority of scientists who are involved in different aspects of the same approach to the resolution of a (yet unsolved!) problem.

The present-day tendency is towards maximum conformity on the basic concepts and the *path* toward scientific truth. Along with this, there exists today, the (perhaps too human) tendency to stifle objective critical analyses of the norm which has been established by the captains of the team and followed by its members. It is implicitly assumed by the individual member of the team that the *probability* of their particular investigation going in the right direction is proportional to the total number of people and dollars that are involved. Thus, for practical purposes, this probability is taken to be unity.

It follows as a corollary that scientific investigations which are conducted by a very small number of people (maybe one!) who are not on

the team, must necessarily have a probability of validity that is essentially zero. Consequently, to take seriously such deviations and their consequence, would indeed be a waste of time to those who are on the *path* to scientific truth.

Certainly, it must not be denied that a great many investigations that deviate from the *path* are in fact logically fallacious and do contradict experience, from the outset. On the other hand, it is most likely that there do exist "deviations" which are quite sound. Nevertheless, to conserve their time, the team will tend to reject the whole batch of deviations. The danger of such a resolution is indicated, quite glaringly, from a slightest probe into the history of science. It is not unknown to most that a very large number of important discoveries in science have indeed emanated from individualists who deviated from the established norm of their day. One can also discover many other brilliant and creative individualists who, through a lack of excessive emotional strength, were stifled by their contemporaries.

Today, the surge of financial aid into the physics community has made the *team* stronger than it ever was—and much less tolerant of "heresy". Certainly, those who belong to the team should continue research in their chosen direction, if they have decided on *intellectual grounds* that this is a reasonable path toward scientific truth. On the other hand, they must not believe, because of their large numbers of colleagues, the brilliance of their leaders, and the net fiscal outlay, that this is the *path*. The history of science teaches us that such belief introduces a brand of dogma into science that can have a disastrous effect on its future progress.

Thus, for the sake of Science, the individualist who wishes to freely pursue his intellectual curiosity must be given equality of opportunity (with his "team" colleagues) to carry out his research—in spite of the deviation of his path towards the mutual goal of scientific truth! Above all, he must not be stifled!

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