Physicists in the Present Emergency

Physicists are presently much concerned as to the part they can and should take in the continuing emergency facing our country. There are few of us to whom World War II did not bring considerable dislocation of career. The younger among us had our training interrupted and large numbers of the older ones were employed in the existing defense laboratories and in additional establishments which were set up to help develop weapons. Some of these establishments achieved such spectacular success that our military men now tend to lean far more heavily on the work of scientists than they have previously. Extrapolating from the experience of World War II, we can but wonder what lies ahead of us.

The technical manpower distribution is substantially different from that which existed in 1940. At that time about one-sixth of the research and development effort of the country was employed in our defense program, leaving a large reservoir of manpower which was available for shifting to the war effort. This made expansion of the laboratories of the armed services fairly easy, as well as the staffing of the entirely new laboratories which were set up. Some of these were directly under the Government and some were operated by contract through universities or industrial corporations. The National Defense Research Committee, and subsequently the Office of Scientific Research and Development, were formed to help shift our scientific manpower into defense work.

In June 1950, more than half of the total research and development effort of the country, measured dollar-wise, was sponsored directly by the Federal Government, and more than four-fifths of the federal effort was devoted to defense projects. The older military research and development establishments as well as those which were put into operation in World War II were, for the most part, working at a level close to the wartime peak. Many university research foundations were putting substantial effort into defense projects, and many universities held contracts for research sponsored by the armed forces. A substantial portion of our industrial research and development capacity was already committed to the defense programs.

Efforts to increase manpower in research and development for defense are meeting with many difficulties. The first and most general area of conflict is with the over-all military manpower requirements. We must put ourselves in a position where another affair like that in Korea will not look profitable to a prospective aggressor, and this is estimated to require three million men continuously under arms. About one-third of these will be made up of professional soldiers and sailors, but the rest will have to be brought in by Selective Service. Since only about a million reach the draft age each year and not all of these are physically and mentally qualified, any long term plan must require more than two years of service of these men. This means an undesirably long hiatus in the training of all our young men, and would be particularly disastrous in a professional career such as physics, yet the discrepancy between demand and supply leaves little margin for deferment.

Even retaining in their professions those physicists now trained and at work is proving difficult. While clergymen and farmers are well enough recognized as unique groups among the population to permit general deferment, physicists and scientists generally enjoy no such favored position. In fact, their position is so poorly established as to permit pronouncements in high places implying that they are less essential in their professional positions than in military service. In the face of stringent manpower requirements this will not make deferment easy.

Many of our physicists are members of military reserve units. The Services face a serious problem here because so many of these reserve officers hold key positions in research and development programs sponsored by the Department of Defense, some of which are evolving weapons vital in the plans of the Services. Efforts to call these men to active duty have led to much confusion, and have shown that in the kind of warfare which we may expect much of our reserve force is really not available because it is busy developing or producing the tools with which the war must be fought.

An alternative of calling reservists to active duty and detailing them to their own or similar jobs exists. This also entails difficulties, because the rank structure of the reserves is not far different from that which existed in 1945. On the other hand, some of our brilliant technical men, whose partly completed education did not make them even eligible for commissions in 1945, are now important project leaders in our technical establishments. Any considerable number of reserve officers on active duty

in a group would sooner or later find intolerable incongruities in rank. Another alternative of assigning key technical officers to similar jobs but in different organizations results in expensive readjustments.

Nearly every technical agency in the Federal Government is wrestling with these problems both as they affect their own operation, and as they affect the agencies on which they must depend to get the contractual help they need. There have been sincere attempts to resolve the difficulties and evolve a workable plan. Selective Service has had a group of advisory committees at work for some time. The Department of Labor has established an Office of Defense Manpower which is dealing with some phases of the problem. The Interdepartmental Committee on Research and Development has been one rallying point for coordination of effort. The Office of Scientific Personnel of the National Research Council is another. This office has provided leadership in the effort to coordinate the views of the four scientific and technical groups, the National Academy, National Research Council, the American Institute of Physics, the American Chemical Society, and the Engineers' Joint Council, who have been asked to advise with respect to manpower.

Resolution of the problem lies within the province and may lie within the power of the National Security Resources Board. But it is evident that the total supply of manpower is inadequate, that many important areas of effort must go shorthanded, and that the best solution is obscure. Therefore, it may be necessary to take the problem to the Congress, which, while not necessarily infallible, is the court of last resort in a problem so basic to the American people. The special problem of the physicists will be presented, we hope in its true light, and we may expect that a workable, if not entirely satisfactory, solution will be found for this group.

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Notes and Comments

To one working in the country's weapons program, and rather used to having such efforts described as being degrading and immoral, it is a little new to have them called *passé*. For this novelty we have to thank Professor Morse, seasoned evaluator of the country's weapons systems. Under the heading: Must We Always Be Gadgeteers? (*Physics Today*, Nov. 1950) Professor Morse has given a sort of prospectus for work in operational research. He justly argues a great need for work in that field, and explains how a physicist who does not particularly wish to stay very close to physics could be effective there. Unhappily, in the course of this argument he invents a class of characters: physicists "whose overwhelming desire is to make more gadgets". He then points at his invention with scorn.

Now Professor Morse knows perfectly well that the physicists who, in trying to find and make an appropriate response to the present political situation, have given what time they could to these programs, have performed a very necessary service, and that ways must be found to increase the number of people available to these laboratories. (He knows, too, that an incidental by-product of such work is to add some interest and urgency to the problems of the operational researchers and thus indirectly contributes to their solution by making it easier for him to drum up recruits.)

When we in the weapons program might write for the help-wanted column we could say that though weapons work is not entirely physics, it is rather more specifically dependent on the information and techniques at the disposal of a person trained in the physical sciences and provides a more certain opportunity for the application of these than does operational research. We would be slow, however, to suggest that this was the only thing a self-respecting intellect might undertake in the way of government service. To do so, we would fear, would be a little too "unsymbiotic".

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There seems to be a twofold reason why physicists are often active in a field different from their own. One of them is the uneasy feeling that perhaps the normal pursuit of science ("gadgeteering" as Dr. Morse would have it) is at the present time perhaps not the best way to serve our country. The other is the widespread belief that for some reason scientists are especially qualified to make important contributions on all subjects from economics to religion. Physicists, who are so much "in vogue" these days, have been frequently victims of this point of view although many of them succeeded in making indeed important advances in these distant fields. It is very gratifying that Dr. Morse so clearly indicates the usefulness of a physicist in operations research. This suggests the old statement that "physics is not a science but a state of mind". To many physicists this new field of work may bring much satisfaction at the present time. The main issue, however, seems to be not whether each scientist is "doing his bit", but rather whether he is "doing his best bit". Some, perhaps most, physicists should keep on teaching and doing pure fundamental work, others should lean toward more applied problems, still others should enter such fields as operation research, etc.

This problem of greatest usefulness is not unrelated to the more general subject of the nature and support of true creative research as opposed to mass production of data. It thus appears that the main issue: when is a particular man most useful? still remains unanswered. Moves are underway to help clarify this situation, and it is perhaps appropriate to appeal here for more discussion of this increasingly vital topic.

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