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How Not to Alleviate the Engineer Shortage

Great shortages periodically confront our nation, and each seems more critical than the last. Rubber, oil, iron ore, tin—each in turn has been scarce, and now scientists and engineers are in short supply. Congressmen and commissioners, business executives and labor leaders have come forth with suggestions designed to solve this problem with dispatch so that we may turn our attention to the next crisis secure in our belief that the shortage is a thing of the past and that all is well. Actually, of course, the shortage is real and it is serious, because the world in which we find ourselves is particularly in need of special scientific and technical skills, and there is no sign that this need will ever be lessened to any significant degree. Since the problem is real and serious, careful attention should be paid to the suggestions which have been made, many of which have merit. However, some proposals are open to considerable criticism and two in particular should be viewed with some skepticism.

The first of these is the suggestion or belief that all can be solved by opening the Federal treasury for scholarship money so that more students will be attracted to engineering or science. This proposal is a poor excuse for facing the facts. In the first place, there is no real evidence that lack of scholarship assistance deters students from these fields. On the contrary, there is much evidence that students are attracted by the ultimate financial rewards in these professions, rewards which are themselves a consequence of the current shortage. But the major objection to this proposal is that it misses completely these paramount points: (1) who will teach the greater numbers of students? and (2) in what laboratories will they be taught? A scholarship program which does not provide means to acquire better laboratories and to attract more and better teachers is doomed to failure. Indeed, it poses a real threat to the educational standards of science and engineering. The country will profit little, if at all, from a larger number of poorer quality engineers. While the shortage is roundly condemned on all sides, it has had its beneficial effects, and one of them is the upgrading of engineers to positions consistent with their excellent training and abilities. We have a fine group of superior engineers at present, and we must guard against lowering our standards.

The second suggestion open to serious question is that the necessary teachers be brought from industry to instruct the larger numbers of pupils. One year has been mentioned as a suitable period for the industralist to be excused from his duties to help with the teaching. Let us give the proponents of this scheme an *A* for effort but an *F* for diplomacy! Although we strongly disapprove of the professional pedagogue who ranks the teaching art and technique above the subject matter, it must be admitted, nonetheless, that there are aspects of teaching the subject matter which are different from its application. Certainly there must be a liking for teaching, an interest in and affection for students, sympathy, firmness, and an approach to the subject at hand which is quite different from personal mastery of it. Above all, there must be, for the successful teacher, teaching experience. These things are not learned and put into practice in one year or, for that matter, in a few years. There are many people in industry who could lend assistance by lecture tours, by counseling, by bringing the attractions of science and engineering home to the students, but the number who can do the actual day-to-day teaching must be rather small. There are a lot of teaching positions open and there are very few "comers." Also, a possible unforeseen consequence of this plan is widespread nervous collapses on the part of the teacher-industrialists. After all, it is often said that the purpose of sabbatical years for professors is to permit them to have their coronaries off campus.

If the shortage of scientists and engineers is to be alleviated, it can be done only by a fundamental attack on the problem. Means must be found to make teaching more remunerative and to provide more laboratory facilities. This will attract more and better teachers. Nothing else will. Halfway and stop-gap devices will not meet the problem. And only more and better teaching will attract more and better students.

H. B