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Science as an Instrument of Service

The disaffection of the young has been in the headlines for several years. Some writers claim to understand the phenomenon and have offered explanations ranging from Freudian father-hatred to fear of the atomic bomb. It is not my purpose to offer any additional insight of this dubious kind; rather, I suggest a means of turning the phenomenon to good advantage at the educational level. For there is no doubt that some of our most thoughtful young people see science as a destructive force. Some of this disillusionment stems from a preoccupation with the failings of science, and especially the failings of technology. But people who complain of the increasing pollution of the air never saw England's industrial Midlands, so appropriately named the "Black Country," early in this century, or even Pittsburgh in the 1930's. Viewed on this time scale, air pollution has been strikingly decreased. Similarly we worry about malnutrition in the southern states, but our ability to detect such pockets of poor nutrition is possible only because of our general high level of nourishment. We forget that beri-beri, scurvy, pellagra, and rickets were rampant as recently as 50 years ago, and that the vitamins that cured them have been known to biochemists for barely a generation.

As for water pollution, in the middle of the last century one drank unboiled water at one's peril, and indeed in eastern Europe and Asia one still does; dysentery, typhoid, and even cholera are still widespread in much of the world. Safe drinking water for city dwellers is a relatively recent gain for civilization.

Thus, the jeremiads against our shortcomings are, in the long run, scarcely justified. On the contrary, the record of steady progress can give us confidence that the residual blemishes and pockets will indeed be wiped out as the power of science and technology is increasingly brought to bear on them. And it is here that teachers can have their greatest impact on the idealistic young. For dissatisfaction with the ills of society and a desire to serve mankind could surely lead some to learn how to make use of science. In the past we science teachers have stressed the fascination of science, the unity of science, or the power of the scientific method; it is time now to stress the role of science as an instrument of service and as the means of curing mankind's ills—time to stress the hope of the future as well as the achievement of the past. For in some fields the scientist wields almost unlimited power for good. The International Rice Research Institute, with a staff of only 16 Ph.D's, has apparently changed the whole nutritional future of Asia in a scant 5 years. The doubled or even tripled yields of rice which their work has made possible may save millions of lives in the next 20 years. True, these men had the resources of the Rockefeller Latin American programs to draw upon. But what a tremendous record of service! Fleming and Waksman, with their observations on microbial antagonism, made similar records: penicillin and streptomycin have saved countless lives. And the long-drawn-out miseries of tuberculosis are now, for us of the Western World, largely a thing of the past. One could cite many other instances of science as man's greatest benefactor, and they are not limited to biology. We need new introductory courses, and new textbooks, dedicated to this theme. A new generation of scientists, eager to put their knowledge to use in the service of mankind, may bring the greatest advances yet.

—KENNETH V. THIMANN, *University of California, Santa Cruz*