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SCIENCE

Lessons of the Intellectual Biography of Science

One of those never-ending battles seems to be going somewhat worse these days: all who love the sciences must be dismayed to see an upswing today in largely uninformed attacks that all but drown out the appropriate, corrective criticisms that we shall always need. If this process is allowed to continue unchallenged, one may indeed wonder for how long even the more striking and beneficent advances of science can command a fair and interested hearing beyond the circle of fellow specialists.

In such a situation, it is doubly urgent to celebrate what is worth celebrating. That was one of the motivations for devoting the current fall issue of *Dædalus*, the journal published by the American Academy of Arts and Sciences, to intellectual biographies of some of the men and some of the conceptions that have transformed science during the last few decades. The authors were asked to address themselves to the journal's nearly 60,000 general readers, as informally as they liked, about their own careers or the careers of the current chief ideas in their fields.

As editor of the project, I found in the essays not only information but a number of lessons—none more intriguing than the confirmation of common properties shared by scientific fields despite the obvious differences between them. It was not surprising that even 400 pages could not do justice to the splendid variety of scientific types and concerns, although the areas sampled range from psychoanalysis and sociology to genetics, molecular biology, chemistry, physics, and engineering. Despite this diversity, one is struck by the reappearance of the same themes, which keep coming up in not very different guises: the efficacy of quantification in the treatment of phenomena; the conscious or unconscious search for symmetries; the use of the concept of an evolutionary development as a fundamental tool of thought (as much in psychological and sociological research as in genetics and astrophysics); the contrary pulls of reductionism and holism. There is surely something like a scientific imagination shared by all scientists, which forms one of the bonds among them and which makes possible the interdisciplinary approach that characterizes almost all the developments here described.

Another of the bonds among scientists may be forged by sharing a style of life that starts with their early experiences as students. The personal development of such diverse scientists as Erik Erikson, Talcott Parsons, Francis Crick, Linus Pauling, and R. R. Wilson, among others here presented, shows that a set of ingenious social devices exists to seek out special scientific talent and to bring the acolyte quickly to the most fruitful frontiers of research. In the process the young scientist usually has both the opportunity of training and companionship with a team and also, in the best cases, the opportunity of developing even his most idiosyncratic and iconoclastic ideas.

Such case studies should be helpful antidotes to the current threats of demoralization that, paradoxically, come at a time when the immense dynamism of science has brought it to its highest plateau of achievement. Given sufficient backing, and given bright students who are eager to take part in the intellectual struggle, we can confidently expect the next decades to bring a flowering of scientific progress for which the successes of the past may turn out to have been simply a preparation.

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