12 June 1964, Volume 144, Number 3624 **SCIENCE**

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE 6-1858.

Time To Pause and Regroup?

Science course improvement is making remarkable progress, thanks to the generosity of able scientists, skilled teachers, and granting agencies. But an essential step remains if the American public is to be brought to a proper level of scientific literacy. To this end specialists in the fields of science must broaden the perspective of their teaching. Otherwise, not only the support of science but effective citizenship in the neotechnical age—to say nothing of the vast possibilities of increasing enjoyment for the individual—will suffer.

Present emphasis is on course improvement from kindergarten through high school, and this is good. It is now clear that the capacity of pre-college pupils has long been underestimated. But the best of syllabi and other accessories cannot operate well without good teachers and informed parents. What happens in undergraduate college years is critical to the supply of both. Except for the small minority who specialize in science or who must have it for professional reasons, too few students elect more science than they are obliged to.

In one liberal arts college, the figure for those who do go beyond the minimum is a remarkable high of about 50 percent of the student body. In another, probably much nearer the national average, the figure is only 15 percent. To lapse for a moment into the approved idiom, the explanation is probably complex and calls for a thorough statistical sampling. Even so, the results of five decades of discussion with students and alumni are too consistent to be ignored.

Right or wrong, the impression prevails that the typical introductory college course is taught with a jealous eye on the possible majors who "must be prepared to take the next course." Meanwhile, knowledge important to the layman is reserved for the advanced courses—carbon chemistry and the energetics of living communities, for example.

Most universal is dissatisfaction over the lack of convincing experience with actual phenomena in the laboratory, which should be the heart of the whole enterprise. Often the student's work in the laboratory is in the charge of cheap and preoccupied labor. This is part of a larger problem that exists in the humanities as well, notably freshman English. There should be some contact with masters, more leisure for reading, for rumination, for trial and error, for simple probing around. What scientist has ever savored his subject, or what scholar the field of literature, by bell and time clock?

The final evil of the one-course-and-it's-over lies in the lack of communication and concession at the beginning level among the science departments themselves. One narrow window, even though clean and polished, is not enough to open the vista which science can give of the world of nature and its component man. There ought to be, in the modern college, a 2-year sequence knitting together the "sciences" into *science*, taught by men who work as a team, who wish to do this, who believe profoundly that it can be done, and who have strong administrative support.

As a practical means to this end, I suggest that a few groups of such individuals be set up and supported for a suitable period of discourse among themselves, and then be given the chance to try out the results. Compared to the millions that have been spent for intensifying the teaching of the separated conventional fields of science, this would be a relatively inexpensive enterprise, but the benefits might well be incalculable.—PAUL B. SEARS, *Department of Biology, Yale University*