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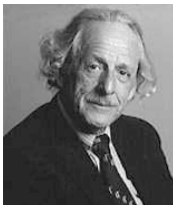

Taking Time Out To Think

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Max Perutz observes in this issue that "many young scientists work too much and read and think too little" (page 11). And I agree.

It's not just a matter of spending too much time at the lab bench; it is also too much time taken to write grant proposals, review those of others, serve on committees, and perform many other activities. While these tasks, taken individually, may be necessary and even worthwhile, too many can dramatically cut into the time spent thinking about one's research.

Younger scientists, those who are looking to get ahead in their careers, may be particularly vulnerable to trying to do too much research too quickly and to taking on too many commitments. The reward system of science actually encourages this, as when tenure or promotion decisions are tied, openly or implicitly, to publishing in quantity and serving on committees.

In a series of letters appearing earlier this year in *Science*, a debate erupted on the virtues of the so-called "60 to 80 hour macho work week" of scientists. Some expressed the view that long hours were part and parcel of being a professional. One remarked, "That type of effort is what it takes to get somewhere" (volume 239, page 1362). Another stated, and rather scornfully, that the 40 hour 9 to 5 [work week] is the mark of the hourly toiler, not the dedicated professional" (volume 240, page 1126). A dissenter wrote that we are in "dire straits if productive professionals are excused from contributing to family, community, and political activities because they are too busy with their jobs" (volume 249, page 588). Of course, each scientist must learn to find his or her own solution to balancing work and relaxation, but the trend to longer hours is certainly apparent.

For those of us who were around 20 and 30 years ago, this work week debate underscores just how much science has changed. The transformations have been many, but clearly one of the more significant has been "the disappearance of leisure time in the academic scientific life," which Rockefeller University president Joshua Lederberg has recently mentioned (*Annual Review of Genetics*, volume 21, 1987, page 230).

I fear that the demands of science today discourage uninterrupted or leisurely contemplation by actually compelling scientists to work constantly. But such contemplation is often vital to creativity and it is im-

portant not to forget this fact. The scientific literature is chock-full of examples of new ideas that have come to scientists *while they were doing something else*, usually something simple or repetitive, such as mowing the lawn or driving an automobile. To cite only one example, the possibility of a nuclear chain-reaction occurred to Leo Szilard while he was waiting for a street light to change while walking in London in 1933.

Taking time out to think is essential for scientists, but it is often easily neglected. Putting aside one's work in order to do it better upon returning may seem counterintuitive. It takes both common sense and a measure of faith in the salutary effects of time away from the bench to stand fast against the career pressures and competitive urges that are woven into the practice of science today.

If you're reading this instead of taking the traditional August vacation, perhaps I've convinced you to take some time off. But if you are reading this editorial while you are on vacation, you probably don't need to hear this message anyway. ■