

PART ONE

An appreciation of what is happening in science today, and of how great a distance lies ahead for exploring, ought to be one of the rewards of a liberal arts education. It ought to be a good in itself, not something to be acquired on the way to a professional career but part of the cast of thought needed for getting into the kind of century that is now just down the road. Part of the intellectual equipment of an educated person, however his or her time is to be spent, ought to be a feel for the queernesses of nature, the inexplicable things.

And maybe, just maybe a new set of courses dealing systematically with ignorance in science might take hold. The scientists might discover in it a new and subversive technique for catching the attention of students driven by curiosity, delighted and surprised to learn that science is exactly as [Vannevar] Bush described it: an "endless frontier." The humanists, for their part, might take considerable satisfaction watching their scientific colleagues confess openly to not knowing everything about everything. And the poets, on whose shoulders the future rests, might, late nights, thinking things over, begin to see some meanings that elude the rest of us. It is worth a try.

—Lewis Thomas, *Late Night Thoughts on Listening to Mahler's Ninth Symphony*.

We begin by focusing on the relationship between mission and planning for curriculum and campus. We also suggest ways that campus leaders can foster an environment in which the community comes to a common understanding about identity and mission, aims and objectives, and about the means to achieve those ends.

There are several paramount concerns as you begin, including the background and aspirations of your students, and the interests and strengths of your faculty, as individuals and as members of the community. You must also give attention to how and why students come to understand what scientists do, to your vision of an environment for teaching and learning in which students come to understand how scientists comprehend the world. Whether you are considering renovating a single classroom or constructing a new multidepartment facility, this is a critical time to step back and ask: "*How can we improve the environment for learning? How do we know what works?*"

In PKAL, we propose that what works is a natural science community, one in which all students—majors and nonmajors alike—are actively and personally engaged in learning, have persistent opportunity to do science as scientists do science, collaborate with student and faculty colleagues. Such natural science communities require facilities different from those built twenty or thirty years ago, when there were fewer opportunities for students to enter into apprenticeships with faculty, when the tools for learning were less sophisticated, when pedagogical approaches were based on a different understanding of how students learn, and—most important—when the program was designed primarily for majors—those who were to become the next generation of scientists.

As you begin, be especially attentive to the rich possibilities inherent in the planning process for creating and sustaining community on your campus, community within and beyond the disciplines to be housed in the new spaces. Your goal should be a structure with soul, one which expresses the institution's values, one which announces your commitment to fostering productive relationships. The spaces should enrich the work and the lives of the students and faculty who today do science within its walls, provide a safe and hospitable environment for learning for years to come, and contribute to the coherence and humanity of your campus. This will happen if you ask some basic questions about the purpose of the enterprise as you begin, and return to those same questions at appropriate times throughout your planning.