letters

Research consortia

Kenneth Smith's comments in February (page 24) on industry–university research programs at MIT were widely discussed at The University of Tulsa. We have long been in the peculiar position of drawing more than half our research funds from industrial sponsors, mainly because the oil industry has invested heavily in petroleum engineering research at Tulsa.

Since 1968, continuing consortia have been an increasingly important means of organization. Typically, member firms pay an initiation fee plus annual dues. These funds support graduate students, pay faculty release time and purchase equipment. Each firm sends one delegate to a semiannual advisory board meeting to review progress, to advise the project director on industry priorities to be considered in selecting projects and to offer assistance on solving current technical problems. Any reports are proprietary for member firms for two years, after which they are available for publication. The four existing consortia currently have total annual funding over a million dollars. Experience with this organizational form leads me to three observations.

First, a significant inducement to attracting members is the forum provided by the semiannual advisory board meeting. It not only reduces the burden of periodic reporting to a single effort every six months, at which time all progress must be documented, but it also ensures that sponsors physically observe the experiment. Feedback is immediate and detailed. Board members observe the graduate students growing professionally as their research progresses, thus gaining an unparalleled opportunity for recruiting students trained in topics of specific interest to them. Because the companies send top technical representatives, these meetings become state-of-the-art seminars.

Second, long-term institutional commitment to a single area of study stimulates an interdisciplinary approach to research that benefits the entire scientific–engineering program of the university. In 1983, Tulsa University Artificial Lift Projects was formed to investigate questions in gas lift, sucker rod pumping, hydraulic pumping of two-phase mixtures and multiphase flows in large diameter vertical pipes. The project directors are a mathematician, Dale Doty, and a physicist. As the physicist, I contribute to experimental design, instrumentation, data analysis and fluid dynamical modeling. We feel that our areas of competence are complementary.

Finally, in a period when universities find it increasingly difficult to retain faculty, research consortia provide experimenters with contacts needed for consulting. Scrupulous care must be taken to avoid conflict of interest with the demands of either the consortium or the university.

For certain institutions, industrial–university research consortia are an attractive way to fund long-term research.

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Test ban—yes

I would like to accept Robert Barker's invitation to contribute to the nuclear-weapons test-ban debate. In both Barker's article and that of Hugh Dewitt in August (page 24), it is obvious that a nuclear weapon is not a scientific research project, but an engineering application of known scientific principles, like an automobile or a computer. In this case, we ought to think of the evolution of a nuclear-weapons design in terms of two steps: the specification of the design problem, and the designer's solution of that problem. Ideally, the specifications should come from the "consumers": the armed forces, the government and, ultimately, the people.

Historically, the government and the people have not assumed the responsibility for determining these specifications. In the years of the Atomic Energy Commission (AEC), all of this responsibility was delegated to the