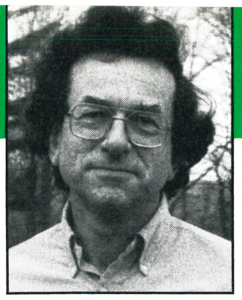

# WHAT'S WRONG WITH THOSE GRANTS

N. David Mermin

My colleague Professor Mozart burst into my office, just back from a pro-SSC rally in Washington and still full of excitement. "The police estimated the crowd at seventy thousand, but it was at least a quarter of a million. It makes you proud to be a physicist. And to top it all off, while I was dodging tear gas canisters, it came to me!"

"Tear gas, at a pro-SSC demonstration?" I gasped in disbelief.

"Yes," he confirmed. "An enormous crowd, unaware that they should have been addressing their concerns to Congress, started to march toward the White House chanting, 'Hey, hey, Allan Bromley, give us the Higgs or we won't go calmly!' and the Secret Service must have panicked. Those teenagers can be frightening, you know. They really get quite out of control when they think we might pass up an opportunity to find the Higgs. And those MIVeBs can be pretty alarming too, when they're on the move."

"MIVeBs?" I inquired.

"Mothers for Intermediate Vector Bosons," he explained impatiently, unable to disguise his disdain at how out of touch I was with the Movement. "But then as the first canisters started to pop, I realized how simple the solution really was."

"Solution to what?"

"The funding problem for the individual investigator, of course! I can't imagine why nobody has thought of it before. We simply abolish all such grants, freeing the investigators to return to the full-time pursuit of their individual science." He settled into my only comfortable chair, beaming with satisfaction.

I've heard some zany things from Mozart before, but this one was just a little too self-serving to let pass. "Very fine for you, W. A.," I said with ill-concealed scorn, "who loathe writing proposals and progress reports and feel no responsibility for training the next generation of physicists. But what about the more conscientious members of our profession? How are they to keep the enterprise of small science alive?"

I hadn't intended to be so brusque with him, but it really is disgusting to see how much happier he's become since his grant was cut. Undeterred by my swipe, he continued.

"You don't understand. I'm not proposing to abolish support for small science—just to stop distributing it so irrationally. Take that next generation. Why do the agencies give out so few graduate student fellowships, and only for the first few years? Because they've tied up most of their funds for student support in individual-investigator grants. The consequences are appalling. Instead of doing their PhD research with the scientifically most congenial professors, students have to go where the money is or work without support. Absurdities abound. Our colleague Smetana, who flourishes with five or six students, has scarcely funding enough for one, while Beethoven, who works best without any, could easily support two or three. The best thing we could do for the next generation would be to remove student support from research grants and divert the funds into a greatly expanded program of predoctoral fellowships that would take promising students through their full graduate careers. Think of the benefits! Students could go to the professors who do the best science, which they're far better placed to judge than the reviewers of grant proposals. Professors would have more time to spend with students if they didn't have to forage about for their care and feeding. Furthermore, we could probably support half again as many students with what the agencies saved on indirect costs by distributing the funds directly to the students as fellowships . . ."

"Hold on, W. A.!" I shouted. "You can't strangle the universities like that. Somebody has to pay for those indirect costs."

". . . and of course the same goes for postdoctoral support," he concluded, oblivious to the note of realism I had tried to sound. "Now once we drop students and postdocs from the grants, is there any valid reason to have grants at all? Funds for travel?" he suggested, eyeing with disapproval the folders of airplane tickets in my in-basket. "Don't be silly! Everybody knows most people spend far too much time at conferences. Why? So they can give talks, preferably invited ones, and publish papers in the proceedings to fatten up their next grant application; so they can meet with like-minded colleagues to coordinate political action on the funding crisis for individual investigators; so they can have some relief from the day-to-day grind of writing, reviewing and reporting on proposals. Publication costs?" he went on, glancing uneasily at the two-foot stack of unopened journals threatening to topple over on my desk. "But you yourself just made the case brilliantly [PHYSICS TODAY, May, page 9] that journals are obsolete and should be phased out. Long-distance phone calls? Postage? Copying costs? Faxing? Most employers cover such employee expenses routinely, and it's high time the universities did too."

"There you go again, dumping more costs on the universities!"

"The only legitimate item for a research proposal," he continued, seemingly indifferent to the plight of the universities, "is the direct material cost of the research itself: capital equipment, stockroom goods and the relevant physical plant. If we retained individual-investigator grants just for those items, then theorists would only have to write occasional proposals for computers and software. Experimentalists would have to work harder, as they do now anyway, but only to get the equipment and supplies directly required for their experiments. And many of these are

**David Mermin,** a professor of physics at Cornell University, has just become, for the first time in his life, the proud proprietor of two individual-investigator grants. His summer salary goes right back into supporting research, through tuition payments to Harvard.

the kinds of expenses on which indirect costs aren't even charged—more savings for the agencies!"

"But . . . but . . . but . . ."

"Of course," he intoned solemnly, "there would be no more summer salaries," adding brightly, "just as there didn't used to be 30 or 40 years ago, when the whole system veered off down the wrong track. In those days science professors weren't any different from the others. They were paid for 12 months, and got 3 summer months off to refresh their intellectual powers. The pay wasn't wonderful, but that summer of freedom was worth a lot. Since then the fiction has grown up that we're only paid for 9 months, requiring an additional two to three ninths of our annual salary to recompense us for the sacrifice of not spending 3 solid summer months on camping trips, beaches or round-the-world voyages. Can anybody believe that? Why, there's nothing we'd rather do than spend the summer working in our laboratories or at our computers and desks, without the distractions of the academic year."

"You entirely miss the point," I chided him. "If summer salary is abolished there will be a massive flight of present and potential academic scientists into industry."

"Wonderful! Technology transfer is what it's all about, and what better way to strengthen the links between fundamental science and economic competitiveness?"

"Not if it leads to the collapse of academic science in America."

"Are you trying to tell me that our best academic scientists are in the universities for the money? Be serious! There's no shortage of people to populate political science departments, though they could make far more in the legal profession. How do we keep our economics faculties when a fresh MBA gets more than a senior professor? The fact is, we're paid to do what we enjoy most. There won't be any exodus. And if there is a real problem of equity—if academic salaries fall so far behind that the professoriate has to take vows of poverty—then it's the responsibility of the universities . . ."

"Hold it!" I shouted, determined to stop him at last. "First you take from the universities all recompense for their contributions to the indirect costs of sponsored research; then, having deepened their fiscal crisis, you blithely announce that if summer salary is required to stave off the wolves, the universities should supply it themselves. But tuition is already at unacceptably high levels. Your scheme relies on an economic miracle . . . hopelessly naive . . . how innocent can you get . . . overdose of tear gas . . ." I sputtered on furiously.

"Are you running for provost?" he inquired politely. "Since it's obviously in the national interest to keep science strong in America, the Federal government should directly and routinely reimburse the universities for the costs of excellent research beyond what tuition payments can legitimately support. And what better way to start rethinking how to do it than by abolishing all the individual-investigator grants, where the overhead tax is at its most bizarre. A reimbursement scheme should be rational, but the present one is, as Jimmy Carter said of the tax code, a disgrace to the human race. Every university negotiates its own formula, whose relation to actual indirect costs, a concept more shrouded in mystery than the true nature of the quantum state, ranges from the unavoidably obscure to the explicitly ludicrous. Bonanzas for a university, like the donation of a new research building, can turn into disasters for every scientist on campus, in the form of more points on the overhead rate. The system pits scientists against administrators in battles of increasing ferocity, even though their actual interests are virtually the same. Growing hordes of academic bureaucrats are required simply to monitor the process, whose salaries drive indirect costs high still.

"Orgies of irrationality result from tying this reimbursement to ritualistic formulas and collecting it from individual investigators as an across-the-board tax. This by itself is reason enough to abolish such grants. Since tuition revenues alone can't support vital scientific studies, the government should institute a direct system of research subsidies to universities. The support could be phased in at the level of what the universities are currently receiving in indirect-cost recovery from all their obsolete individual-investigator grants. Future payments would be updated every ten years at the recommendation of national panels of peer reviewers similar to those that evaluate proposals for major research centers. The evaluation would be based on the total research accomplishment of the university in the previous decade, and the amount would be entirely decoupled from the content of whatever individual grants remained, so that the entrepreneurial successes of one could no longer impose ridiculous taxes on the funds of others. A basic allotment for equipment and supplies would also be awarded directly to the universities for internal distribution by local decision, which is invariably better informed than the opinions of outsiders. And with the decennial reviews in mind, the universities would be far better motivated to see that the funds are well spent. Only people with special needs for extraordinary equipment would have to apply directly to the agencies for individual-investigator support. Besides paying for traditional indirect costs, universities could use the funds, at their discretion, to resupply scientists with some of the 'expendables'—telephone calls, I would hope, at a minimum—that are currently, and absurdly, covered by research grants."

And he beamed at me. I threw him out of my office. "Go join the MIVeBs!" I shouted after him. "They could use some better chants! I've got more important things to do." And I did: a progress report to write, a new proposal to submit and three to referee. ■


"NO, THIS ISN'T LOW TEMPERATURE PHYSICS. HE'S JUST TOO CHEAP TO TURN ON THE HEAT."