Notes

1. For example, the National Science Foundation's (NSF's) grant to theoretical physicist Paul Ginsparg and his colleagues at Los Alamos National Laboratory to maintain a server of high energy physics data, the NSF grant of $450,000 to launch *Astrophysical Journal Letters* online, and the funding of the Mosaic program by the National Center for Supercomputing Applications.

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Worthy Pursuits

In his editorial "Degrees of freedom" (18 Aug., p. 903), Don S. Doering eloquently describes the plight of new Ph.D. researchers who, in trying to adapt to a tight academic job market, face a strong prejudice against any career other than academic research. To answer his question, "How do we fix a system that . . . has produced many more Ph.D.'s than the market can bear?" I suggest that academic scientists who espouse that prejudice be limited to training only enough Ph.D.'s to replace themselves (or even fewer, if budgets in their field are shrinking). How can they ethically train any more than that, when they knowingly condemn the additional ones to a professional life they regard as inferior?

Academic scientists typically supervise Ph.D. theses from their thirties to their sixties; allowing for those who die early, switch to administrative positions, or otherwise leave the field sooner, each needs to train a replacement no more than once every 20 years or so. When the issue is put to academic scientists this way, some will stand by their beliefs and ease the imbalance on the supply side. The others, faced with giving up most of their cheap labor supply, will probably come to realize that for a student to pursue a career outside the academy maybe isn't so unworthy after all.

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Asymmetrical Ability

Oliver Sacks (Letters, 5 May, p. 621) suggests that the development of exceptional musical abilities in some individuals with neurodevelopmental disorders such as autism and Williams syndrome constitutes a "savant" talent and as such might represent a "neuromodule." He speculates that the exaggerated leftward asymmetry of the planum temporale area of the brain recently reported in a group of professional musicians by Gottfried Schlaug *et al.* (Reports, 3 Feb., p. 699) may reflect the neuromorphological substrate of such a neuromodule.

In fact, we have carried out analyses (*1*) of the planum temporale in individuals with Williams syndrome. The surface area of the left and right planum temporale of four subjects was measured with magnetic resonance images (MRI) with the same anatomical criteria used by Schlaug *et al.* The planum temporale asymmetry for these individuals with Williams syndrome was on par with that of the group of musicians studied by Schlaug *et al.* (mean, −0.23; standard deviation, 0.24). Three of the four individuals with Williams syndrome had greater asymmetry than that of the musicians, but less than that of musicians with perfect pitch. In contrast, five normal control subjects had an asymmetry coefficient that was consistent with the nonmusician control group in the study by Schlaug *et al.* (mean, −0.34; standard deviation, 0.14). In addition, subjects with Williams syndrome did not differ from normal subjects in total planum temporale surface area (1000.8 versus 962.1 square millimeters, respectively), despite significant overall reduction of cerebral volume reported in subjects with Williams syndrome (*1*), suggesting disproportionate growth of the entire posterior supratemporal region.

These preliminary data suggest that disproportionate growth, and perhaps exaggerated asymmetry, occur in the posterior supratemporal region in individuals with Williams syndrome. However, establishing whether this asymmetry is a source of musical ability will have to await more detailed analyses. Also, the fact that individuals with Williams syndrome typically possess exceptional language abilities relative to other cognitive domains and despite mental retardation (*2*) introduces the possibility that planum temporale asymmetry is related to linguistic abilities rather than, or as well as, musical abilities.

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1. T. L. Jernigan, U. Bellugi, E. Sowell, S. Doherty, J. Hesselink, *Arch. Neurol.* **50**, 186 (1993).
2. U. Bellugi, P. P. Wang, T. L. Jernigan, in *Atypical Cognitive Deficits in Developmental Disorders: Implications for Brain Function*, S. H. Broman and J. Grafman, Eds. (Erlbaum, Hillsdale, NJ, 1994), pp. 23–56.

Fusion Progress

We disagree strongly with the letter by David Montgomery (8 Sept., p. 1328) in which he criticizes the fusion program for an alleged lack of scientific culture and content. He characterizes the field as it was in its infancy, approximately 20 years ago. He does not acknowledge the program's success and degree of scientific maturation in the intervening two decades.

It is important to understand the implications of the fact that the fusion process requires high temperatures, on the order of 10 kilovolts, and that the behavior of matter at these temperatures takes on special properties, well outside those typical of terrestrial experience. Investigating these properties has led to the development of the subfield of high-temperature plasma physics. Facilities have been developed that are capable of producing plasmas of fusion temperature and density, and, as well, the science governing the behavior of these plasmas has also been developed. This science base has three parts: (i) a much increased and continually expanding understanding of the underlying physics; (ii) an ability to test this understanding with specialized diagnostics routinely producing detailed time-resolved profiles of density, temperature, magnetic field, current, and so forth; and (iii) the development of sophisticated computer codes that translate fundamental understanding into practical tools for experimental testing of theory and for fusion facility design.

Montgomery criticizes, in particular, fusion plasma diagnostics. His characterization is out of date. Diagnostic instruments have been developed and widely deployed to measure the spatial and temporal profiles of *all* the internal plasma variables he says are largely lacking. Comparison of these measurements with theory indicates a mature, first-principles understanding of plasma stability, control, and current flow. Plasma transport, being driven by low-level turbulent processes, is less well understood from first principles and is the subject of intense current research. An empirical description is also being developed through a "wind tunnel" approach to design new machines.

Montgomery also criticizes the technical review processes of the fusion program. However, with the increased internationalization of fusion research over the past two decades, American plasma physics and fusion research have experienced much wider and more intense assessments than could be had earlier through the "rough-and-tumble