publication will be followed by requirements that all science courses, everywhere, be taught in English; that all students, everywhere, learn English well enough that visiting American professors need only give their colloquia, and conduct their scientific discussions, during a sabbatical year, in English; and that all shopkeepers and restaurateurs learn sufficient English to equip and feed those who arrive to educate, not to learn from, "the out-of-date natives."

On the one hand, Gingerich stresses the preprints of the most current scientific papers which keep his own work *à la mode;* on the other hand, he mentions those European scientists who were concerned that their past work was being simply rediscovered in that current work to which he refers. This would seem to be an amplifying situation, unless indeed one prohibits all past, present, and future non-anglicized work and references. I remember Bruce Billings—a predecessor of Gingerich at the American University in Beirut—once telling me that all kinds of PhD theses could be inspired by reading *der Annalen der Physik* of 50 years past. In my own scientific wanderings, I have more often found myself simply wistful, in a scientific interchange (especially, a dispute) at the language nuances I *did not know,* which inhibited better and more current learning from that interchange, than I was content that in some years I could read all this in an English-language journal or translation. Gingerich stresses preprints to remain *au courant:* myself, and most of my colleagues interested in frontier curiosity, rather than *à la mode* state-of-the-art computing algorithms, depend as much on discussion and letters—in "their," rather than "my" language—intercountry or interdiscipline.

Gingerich's left-handed defense of the language *requirement,* as a concession to historical origins and image, subordinates language *learning,* as a necessary part of a *global* curiosity in a *whole* world—of geography, of ideas. (Most of my colleagues will realize I write this letter in envy of, rather than in facility with, such language fluency: non-English or English.)

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12/13/77 *Paris, France*

THE AUTHOR COMMENTS: The wide spectrum of well-argued responses to my letter on PhD language requirements demonstrates that this is still a highly controversial topic. In retrospect, although I still believe that nowadays it is difficult to justify a foreign language as a working tool for the astronomy or physics PhD, I would have emphasized far more strongly its desirability as a communications link in the international network of science. As an active historian of astronomy, my curiosity ranges far beyond preprints, and I am acutely aware how a greater knowledge of both ancient and modern languages would provide richer insights into the intellectual movements that make up our scientific heritage. A broader ability to communicate in tongues other than English would have greatly alleviated innumerable moments of frustration I have felt in the past several years during my visits to over 80 foreign libraries and observatories. I regret that my tone may have seemed wistful or insular because I favor a language requirement, and I heartily endorse the Boulder scheme of justifying a foreign language as a communication device rather than as a research tool.

OWEN GINGERICH
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2/21/78 *Cambridge, Massachusetts*

Invention of the laser

I was horrified to read on page 32 of the November issue that "Optical communication started in earnest when Arthur Schawlow, Charles Townes, A. M. Prokhorov and Robert Dicke invented the laser in 1958." This attribution of credit for the invention of lasers by Hans Melchior does not contribute anything to his subject—optical communications—but it does injustice to several scientists who had contributed at least as much as some included in the above list. I am thinking first of all of Theodore Maiman and Ali Javan, who made the first solid and gas lasers respectively in 1960, but there are several others. For the history of the inventions I refer to *American Journal of Physics* **34,** 903, 1966. It is an involved matter and a controversial subject that cannot be settled in a few lines.

BELA A. LENGYEL
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12/8/77 *Northridge, California*

THE AUTHOR COMMENTS: Bela Lengyel's endeavor to give proper recognition to all the scientists who contributed to the invention and the realization of the laser is certainly appreciated.

HANS MELCHIOR
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1/9/78 *Zurich, Switzerland*

Ge(Li) revolution

Richard Pehl has written an informative account (November, page 50) of the characteristics and applications of germanium gamma-ray detectors with emphasis on the newer types made from high-purity material.

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letters

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It is understood that Pehl's section on lithium-drifting techniques was intentionally descriptive rather than historical; nevertheless, by not citing any references covering the rapid development of large Ge(Li) detectors in the mid-1960's, his account does not convey how great was the impact of the resultant revolution in gamma-ray spectrometry.

The advent of high-purity germanium has simplified the making of detectors, increased their reliability, and made possible complex arrays previously considered impractical. But it was the earlier development of large lithium-drifted devices that was responsible for major advances in all fields of nuclear science dependent on high-resolution gamma-ray measurements.

This was recognized by the American Nuclear Society in 1967 when it made its first Radiation Industry Award to George T. Ewan and Alister J. Tavendale with the citation, "The recipients are honored for their pioneering work in developing large-volume lithium-drifted germanium radiation detectors and applying them to gamma-ray spectroscopy. This work has revolutionized the field of gamma-ray detection and has had a profound effect on nuclear physics and spectroscopy, activation analyses, biomedical applications of radioisotopes and other fields where the availability of high-resolution gamma-ray detectors is of importance. The immediate widespread acceptance of these detectors is a tribute to their superiority over previous gamma-ray detection systems and to the vital importance of this development."

Tavendale (now at AAEC, Lucas Heights, Australia) and Ewan (now at Queen's University, Kingston, Canada) did their work[1-3] at the Chalk River Nuclear Laboratories of Atomic Energy of Canada Limited. Tavendale was attached to the Counter Development Section, which, under the leadership of the late I. L. (Dick) Fowler, played a major part in the Ge(Li) revolution.

References

1. A. J. Tavendale, G. T. Ewan, Nucl. Instr. & Method **25,** 185 (1963).
2. G. T. Ewan, A. J. Tavendale, Nucl. Instr. & Methods **26,** 183 (1964).
3. G. T. Ewan, A. J. Tavendale, Can. J. Phys. **42,** 2286 (1964).

G. A. BARTHOLOMEW
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12/20/77

Nuclear disarmament

This year sees the twentieth anniversary of the Campaign for Nuclear Disarmament Easter march to Aldermaston. My colleague, Richard Taylor of the University of Leeds, and I are undertaking a study of the CND 1958–65 period. We would very much welcome the opportunity of hearing from any of your readers who were active during this time and who might be willing to help in our study.

COLIN PRITCHARD
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3/1/78

More on tenure

There is an absurd hypothesis in letters on tenure such as the one in February (page 83) by Robert Joel Yaes. I would agree with his contention in the last line if he deleted the two words "older" and "young." *Nonproductive* doesn't automatically mean *older.* I know of many unproductive assistant and (tenured) associate professors and of many full professors who are extremely active as well as some who are not. Replacing a man with command of a field, vast experience, and research vitality by younger men, who do not demonstrate the same capabilities, simply because they are younger would be idiocy even if they are many times cheaper. Good people are still being hired. The ones who should have gone into less demanding fields and who expect lifetime guarantees simply because they have PhD's have a lot to learn. Nothing in the American system guarantees a particular kind of job for a young graduate. Many aspire to be physicians or dentists or lawyers or movie stars and must settle for something else. Perhaps a junior college would be in order, or industry. A university should keep the ones who are on the frontier and those will continue to be in demand and should be. Happily for me, I'm still young; however, ability has nothing to do with age. If "bright" and "young" go together, and one becomes less bright as one gets older (and everyone gets older), it is important to minimize the problem by picking only superbright new graduates and assistant professors to allow for the eventual degradation. Perhaps a 200 IQ minimum for tenure!

G. ADOMIAN
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2/27/78

Ultrasonic resolution

The article on computerized x-ray tomography by William Swindell and Harrison Barrett (December, page 32) is a good tutorial on the subject. On page 32 (columns 2 and 3) they call attention to the importance of considering both attenuation and wavelength in optimizing ultrasonic system resolution. However, in describing this resolution, at least one other important parameter should be considered, which is unfortunately often neglected by those designing or using