Letters to the Editor

NSA Policy on Contact with Foreign Nationals

I read with interest the article by Ezra Brown on working at the National Security Agency. It sounded exciting. However, NSA will not hire Chicano mathematicians like myself. Somehow, because I have Mexican aunts and uncles living along the border in Mexico, I apparently am a security risk. Before applying for a summer position at NSA in the mid-80s, I had worked at Sandia Laboratories for two years in the '70s, where I had held a security clearance. When I went through the interviewing process at NSA, I was told that NSA employees should not have contact with foreign nationals and I was asked if I would comply with their regulations. I said that I still had cousins in Mexico who regularly came to Tucson and that I usually saw them, though I and my immediate relatives were all U.S. citizens. I certainly couldn't believe that NSA would expect me to turn my back on these relatives when they came for a visit. The interviewer would not answer my repeated requests for a clarification of this; she just kept on repeating the question, was I willing to comply with the regulations of NSA. After a half hour of this I stated that I could not comply, and I was not offered a summer position.

The Chicano population living in the Southwest pays its taxes and through these taxes supports the activities of this government and its agencies. Yet, government agencies like NSA can create discriminatory policies, in the interest of national security, that keep us from participating in their activities. It is time to put an end to the institutionalized discriminatory practices of this federal agency. NSA must rethink those rules that serve to keep out the Chicano population from their workforce.

In the past, the membership of the AMS has always responded to human rights issues from around the world. I would expect this same concern on an issue that impacts on our own citizenry.

William Yslas Velez
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Electronic Discussion of Issues by Candidates

This is in regard to the turnout in the AMS elections. There has been concern expressed about the low portion of people who vote. Let me say why I personally did not. I did not have the information to make an informed choice about whom I want to represent me. This is because such details as what papers a person has published (many of which I cannot read, since they are not in areas that I am familiar with) are far less important than things like where the candidates stand on important issues. Thus, from my point of view, practically the only relevant information that I have is the rather general personal statement of under 200 words.

Therefore, at present what I have is a choice between an uninformed vote and no vote. From my perspective the only difference between the two is a small amount of effort followed by the cost of a postage stamp. Therefore, I saved myself a little bother and did not vote. And from some informal interactions I know that I am not alone.

One possible solution is for the candidates to engage in a public discussion on the issues. Obviously it is impossible for the candidates to meet in one physical location with a substantial proportion of the AMS members present, but that need be no obstacle. Already a substantial proportion of the AMS members read the newsgroup `sci.math` on a regular basis, and most

of the rest either have access or could get access to it fairly easily. As far as I can see, it would be well suited for the purpose. All that would need to happen is that some of the candidates would need to post there and be willing to answer a few questions.

It is my belief that if this happened, then not only would the quality of information available for the voters go up, but the number of votes cast would also go up. Furthermore, it would be quite simple to implement and need involve nothing formal. In fact, if some of the candidates would just think about the fact that on `sci.math` there are enough votes already to swing the vote in their favour, then it should happen naturally.

In hopes of seeing candidates posting on `sci.math`,

Ben Tilly
(graduate student)
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(Received September 4, 1994)

Ph.D. Production and the Current Job Market

I was pleased to read (*Notices*, October 1994) the thoughtful letter prepared by Curtis Bennett of the Young Mathematicians Network (YMN) in response to the AMS National Policy Statement.

It is true, of course, as the YMN letter states, that "the 50% increase since 1987–1988 in the number of Ph.D.s granted each year in this country has helped to create the problems in the job market." However, discerning future needs and estimating the impact of pronouncements that we might make today are difficult and complex problems. The development of a statement on the job market by the Federal Policy Agenda Subcommittee of the AMS Committee on Science Policy generated substantial discussion and feedback. In an early draft of the National Policy Statement we called for a modest reduction in the number of Ph.D.s produced and for an increase in the number of permanent job opportunities, to be created by shifting the balance of basic undergraduate teaching towards the use of permanent faculty and away from the current overemphasis on the use of teaching assistants. Ultimately, however, we concluded that it would be inappropriate for the committee to include such a quantitative recommendation in the current AMS policy document.

The committee was quite aware that it would be easy to make statements today regarding Ph.D. production that turn out to be as erroneous five years hence, when their major impact would be felt, as were statements regarding the job market made some four or five years ago. In addition, the AMS has a new policy committee, the Committee on the Profession, that was just beginning its work at the time we were completing the National Policy Statement. We felt that a detailed AMS recommendation regarding Ph.D. production, should it be possible and appropriate for the AMS to make such a recommendation, required study by this new committee.

I see from a recent YMN newsletter (Volume 2, Issue 23, July 6, 1994) that Curtis Bennett is a member of one of the subcommittees of the Committee on the Profession. I am pleased that members of YMN are involved in those discussions, as this is an excellent way to have an opportunity to influence whatever position the AMS is able to take on this very important issue.

Frank Warner, Chair
Federal Policy Agenda Subcommittee of the AMS Committee on Science Policy

(Received September 5, 1994)

Proposal for a New Mathematical Society

If I had the time (which I don't), I would found a new organization with a title like "The *Research* Mathematical Society" to counter the lamentable state of the AMS, which has become like a professional society of grocers or insurance salesmen, profaning the sacred vocation of mathematics (witness "Mathfest"). The purpose of the new organization would be to further research in mathematics as single-mindedly as humanly possible, leaving to other organizations (or individuals) peripheral things such as politics, funding, prizes, education, job placement, and so on. These may be worthy areas influencing research mathematics, but paying attention to them dilutes the pure pursuit of mathematics, whose aim is to discover, prove, and understand theorems.

I long ago stopped attending AMS meetings (especially national ones) when it became obvious that it was no longer possible to discuss real mathematics at them. In the real old days, people would get together, at meetings over coffee or beer and exchange theorems and ideas endlessly. No more!

First, a partial list of what the proposed society would avoid.

1. Tie clips with integral signs
2. Barbecues
3. Employment registers
4. Prizes (which corrupt and distort the subject)
5. Questions of education, particularly calculus reform
6. Riverboat rides
7. Politics
8. Funding questions (especially involving the NSF)
9. Musical performances at meetings
10. Lobbying
11. Publishers' receptions

Lest the tenor of this letter be too negative, let me stress the main *positive* functions of the proposed organization.

A. To hold meetings where mathematical lectures are given and mathematical discussions of all kinds are encouraged.

B. To publish a *Notices* where meetings are announced and described. Possibly to publish some books and research journals.

Finally, as though this letter were not inflammatory enough,

C. To set up some minimum standards for membership—too many people join the AMS solely because it looks good on their credentials. Such a standard might be having published at least one mathematical paper every two years for the last ten years, with some sort of exceptions for young mathematicians and Gödel. Since we can't drive the moneychangers from the temple, let's build a new temple!

Lee A. Rubel
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The Meaning of Proof for a Mathematical Researcher

Although there haves already been two responses in the *Notices* (by Stephen Krantz and Saunders Mac Lane, respectively) which have criticized Horgan's article in the October 1993 issue of *Scientific American*, I would like to add some further comment and critique. Despite the fact that Horgan ignores the possibility of programming errors and that there are numerous areas in mathematical research where computers are not particularly useful, he also seems to proceed from the narrow viewpoint that the *only* function (purpose) of deductive proof is that of the establishment of mathematical truth.

However, proof has many other extremely important functions in mathematics which cannot easily be achieved by computer, e.g. explanation, systematization, communication, self-realization, etc. For example, computer verification (in most cases) may confirm the validity of results but provides little or no explanation.

We cannot simply dismiss the power of certain software to verify mathematical results in some areas. Recently Branko Grünbaum used *Mathematica* to verify some geometric results, and his concluding comments are highly significant: "*Do we start trusting numerical evidence (or other evidence produced by computers) as proofs of mathematics theorems?... If we have no doubt, do we call it a theorem?... I do think my assertions are theorems... The mathematical community needs to come to grips with new modes of investigation that have been opened up by computers.*"

Recently I also had similar experiences, experimentally discovering and verifying some original results with dynamic geometric software such as *Geometer's Sketchpad* and *Cabrigeometre*. (The latter program has a facility for checking the validity of certain geometric properties *in general* and the ability to construct counterexamples when they're not. Although I was initially very skeptical about this facility, I have yet to "*catch*" it out and have consequently learnt to trust it to a very large degree.) Despite this *a priori* conviction, I still had a need to deductively prove them, not because I doubted their validity, but because I wanted to try and understand *why* they were true. (In some cases this understanding enabled further generalizations!) There is a world of difference between merely knowing something is true and knowing why it is true. Furthermore, proving something one's discovered (and already confirmed) experimentally is an intellectual challenge, not really an epistemological exercise in establishing its "*truth*". To paraphrase Hilary's famous comment on his reason for climbing Everest: "*We prove our results because they're there.*"

In conclusion, therefore, mathematical proof is certainly not dead or dying as Horgan tries to assert, but in certain areas the traditional view of it as *only* a means of verification may be.

Reference

B. Grünbaum, *Quadrangles, pentagons and computers*, Geombinatorics, **3**, (1993) 4–9.

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U.S. Math Education is O.K.

It is quite frustrating to see the current wave of education-bashing being given circulation by the *Notices*. In the article by Hy Bass (October 1994, 923–926), we read the following astounding statement: "Countries like Germany and Japan show that the problem is not in our genes. Large-scale low performance of students must now be judged to be the failure, not of the students, but of the educational system."

Everything in the statement is false. In the first place, across-the-board comparisons of mathematical education (*Education in States and Nations*, National Center for Education Statistics, Washington, D.C., 1993) indicate that exactly the reverse of Bass's claim holds: When students with similar genes are compared, those in the U.S. perform as well as or better than those in other countries. Thus, U.S. students of Asian ancestry performed better than students in Asian countries, and U.S. students of European ancestry performed comparably to or better than students in European countries. Other indicators speak to the superiority of U.S. education: In the International Mathematics Olympiads, the U.S. regularly places in the top group of nations. The 1994 team, all of whose members attended public high schools, finished in first place, recording the first-ever perfect scores by every team member. U.S. universities and graduate schools are the institutions of choice for students from around the world. U.S. Ph.D.s in mathematics are numerous and of high quality.

I don't intend to claim that our system is perfect, and I believe very strongly that much improvement is possible, and indeed essential. But such improvement must be made by building on the system's strengths rather than by falsely declaring the system to be a failure. In particular, one direction to proceed might be to ask why there *is* a difference in performance related to ethnicity. Prof. Bass's long list of proposals does not even mention this question. I recommend the article, "Race, Retrenchment, and the Reform of School Mathematics," by William F. Tate, in the February 1994 issue of the *Phi Delta Kappan*, for a thoughtful analysis of this problem. There are many other avenues along which progress is being made. But a bunch of university professors declaring the system to be a "failure" and stepping in to "mentor" teachers to assure "quality control" is certainly not one of them.

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