To the Editor

Proxmire, NSF and basic research

Here we go again, discussing the merits of basic research ("Proxmire vs. NSF," SN: 3/15/75, p. 165), which seems to be at the heart of many of the problems of science funding. As a Ph.D. candidate in physiology and cell biology, I am acutely (or, over the past three years have become chronically) aware of science's "ambling retreat" (p. 169), especially since I'll have to find a job next year.

It seems that the battle between scientist and senator is based mainly on the position and responsibilities of the NSF in the Washington bureaucracy. We have the past Administration to thank for the current mess. Science advising has been taken out of the White House and is recalled whenever there is a problem which needs to be solved.

Although it may not have been a conscious effort, the "war" on cancer was probably the greatest blow to basic research that we've seen in a long time. Why dawdle around with all of this basic research? Why not just jump in there and solve the world's problems? And now we are faced with another "war," this time on the energy problem. A researcher has a heck of a time getting funded unless he can directly apply his basic research to a current problem. If that isn't possible, he has to drum up the research grant as a possible "seed" project which may prove to be of basic value sometime in the future.

Let's face it: A researcher is going to go where the money is, and if he thinks long enough and hard enough he can write a grant proposal linking phagocytosis by *Amoeba proteus* to the surface antigens of lymphoma cells. He may not cure cancer, but there's a chance he'll stay solvent for a couple of years. And during that time he can do his basic research, which was the point of his grant proposal in the first place. If he publishes enough, he may even get promoted.

I've come to the conclusion that scientists are an independent lot. They don't like to be bridled and harnessed to a surrey to carry the Senate Appropriations Subcommittee to Capitol Hill. Let us hope that Senator Proxmire will some day see the value of basic research; however, we don't have much to be optimistic about right now.

Robert Chiovetti Jr.
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As a taxpayer interested in the advancements of science, I find it proper and fitting that NSF should justify its grants to the Senate Appropriations Subcommittee. If the projects have merit, then merit should be evident to the press, the taxpayer and even to "yahoo" senators.

Science and scientists are not above the boondoggle, and the projects cited as being questioned in SCIENCE NEWS raise doubts in my mind even after the supposed "justification."

As a taxpayer, I am disappointed that NSF would fund a study on "why people fall in love"—yes, despite the country's divorce rate—either for the University of Minnesota or for my alma mater, the University of Wisconsin. Because a challenged researcher calls Senator Proxmire's objection to her study "out of the Dark Ages" does not establish that she is right, nor is it relevant to whether or not her study is/was worth doing.

The childish finger-pointing because the state university of the Senator's home state is engaged in similar nonsense (my opinion) is no argument for the saneness of the project. However, it may possibly argue for the integrity of the Senator's investigation.

Anna Marie Mulvihill
Vienna, Va.

Science ed: Math, calculators, women

The March 15 SCIENCE NEWS was most interesting, especially the article by Dietrick E. Thomsen on "Olympics in Mathematics." This is almost my own experience. I've suspected for years our schools don't teach math. (They teach arithmetic; but not math.) If our schools really taught math; there would be very few people who didn't understand it. Everyone would understand it the same as English, etc.

As for myself, I never learned math in school. I learned it in a radio-electronics-TV trade school in Detroit in 1947. That's when I first really got hold of algebra; in both hardware and equational form. That's when I first found out the stuff really does work! After that, then I went to town with it and taught myself calculus, differential equations and tensor calculus from studying different books which I got by mail order while overseas in Korea at the time. There were very few books in the United States, on tensor math at that time. The only books available were translations into English from German, and poorly done!

I never said much about the fact that I didn't learn math in school because we have children and I don't want to talk them out of going to school. But I did point it out to them and then said no more of it. I hoped that they might make out in spite of the school. It appears they did, for one finished up and another is now working on his degree. And this article by Thomsen shows they do make out in spite of our school systems. To me, calculators will help immensely, not hinder in the least bit. That is a piece of hardware by which the math can be checked out. I am also convinced calculus can be taught to children under 10 years of age of average intelligence.

I certainly do appreciate these articles on math. I always have liked your magazine and have read it off and on ever since the early 1950's.

M. D. Bernard Jr.
Merritt Island, Fla.

Your article expresses my opinion of the new math; I fear we have raised a generation unable to perform simple arithmetic because they have avoided the "dullsville" routine of memorizing the multiplication tables and all of the sums and differences through 18. In the same way I am dismayed that the same (or older even) generation has difficulty reading and writing and hence has lost contact with the world's treasury of knowledge and has lost the ability to communicate concisely.

I think all of the interesting class problems quoted in the article about calculators could be performed without them if the teachers teach first how to round off to two or three significant figures. In high school, they should start to teach scientific notation (only one or two calculators currently handle it under $50). Then there is no problem in handling the distance to the moon in electron-orbit diameters (if you want to) or in miles. Kids love to count out lots of zeros and move the decimal around according to the rules.

Most of the inexpensive calculators have 8-digit capability and so could not even handle the problem at the top of page without overflow.

G. C. Trembly
Arlington, Mass.

Prof. Greitzer may well be correct in his condemnation of what is called "the new math." Even if he is not, I do not have sufficient information to dispute him. I must, however, take issue with his pointing to the Bronx High School of Science as a paradigm of the evils of the stress on "the new math."

First, the fact that Bronx Science didn't place any students in the top 25 finishers in the U.S. Math Olympiad shows only that last year Science did not have any students who placed in the top 25 on the day the exam was given. Second, it is not clear that high scores on these exams necessarily are indicative of great ability in original mathematical research (in fact, a good case can be made that high scores on these exams are indicative of little more than ability to solve problems similar to those on the exam when under time pressure. Furthermore, in his article in the March 1975 AMERICAN MATHEMATICAL MONTHLY, Prof. Greitzer points out that high scores on the annual High School Mathematics Examination, which are usually the criteria for selection to take the Olympiad Exam, don't even show good correlation with high scores on the Olympiad Exam!). Third, the top U.S. scorer, Paul Zeitz, and the fifth high scorer on the U.S. exam, Eric Lander, were students at Stuyvesant High School in New York (Bronx Science's academic arch-rival), a school where, like Bronx Science, entry is ". . . by competitive examination, and the school recruits its pupils from the best of the mathematically and scientifically minded in New York City." The math curriculum at Stuyvesant is similar to that at Science and, if Science "went wild about the new math" then, so did Stuyvesant.

I mean no disrespect to Prof. Greitzer

but I suggest that the facts and opinions that I've mentioned are worthy of his consideration and that his condemnation of Bronx Science is, a bit, groundless.

Edward N. Schwartz, Ph.D.
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Bronx Science '65
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What a shame our students have to say they learned mathematics in spite of the school (SN: 3/15/75, p. 174).

I believe it would be best for our country to abolish our "school of education" in the universities. Require teachers to meet all requirements for a degree from the school of arts and sciences.

As one questions whether to have calculators in the classroom, look at the typical questions from the International Mathematical Olympiad. Will a calculator solve them?

James F. Jackson
Carlisle, Ind.

It appears as though Deedee Pendleton could have used a calculator herself when she wrote her article on "Calculators in the classroom." Her opening sentence states that Conrad, a Washington, D.C., second grader, is 7 years 3 months and 5 days old, and that this figures out to 1 billion 296 million seconds. If she had checked her second grader's results with her own calculator she would have seen that his age actually figured out to slightly less than 230 *million* seconds!

A billion seconds is actually quite a long time. One of the techniques used to impress upon the general public the differences between a million and a billion (particularly when the Federal budget is being discussed) is to point out that a *million* seconds is just over 11½ days, while a *billion* seconds is about 4 months short of 32 years!

William A. Robinson, P.E.
Solon Mills, Ill.

Clearly the opponents of calculators are after a red herring. The real villain is pencil and paper. Languages of all kinds have suffered since the introduction of these tools. Man is surely in the last stages of terminal sloth.

James Breasted
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Aspen, Colo.

Bravo for your article "Women in Science" (SN: 3/15/75, p. 171). As the only black female plant pathologist in the U.S.A. (as far as I know), I am acutely aware of racial and sexual imbalance in the scientific community. Please let me know how I can get a chance to see the slide-cassette program mentioned in your article. Thank you.

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(To purchase the six-part slide-cassette program, expected to be available by early summer, contact Dinah Moché, project director, Physics Department, Queensborough Community College, Queens, N.Y. 11364.—Ed.)