

# Science<sup>®</sup> News

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**COVER:** A more sophisticated basis of scientific management and a better understanding of the economics is necessary if maximum sustained yield in the harvesting of wild animal and plant resources is to be achieved. Biologists and wildlife experts met in Virginia to initiate ways to meet the challenge. See p. 259. (Photo: World Wildlife Fund)

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April 19, 1975

# To the Editor

## Learning mathematics

The two related articles in the March 15 issue, "Olympics in Mathematics" and "Calculators in the Classroom," touch on some things I have been thinking about for quite some time.

I have found that the vast majority of students do not have a basic understanding of what it means to perform an operation with two numbers. Addition is usually understood, but its relation to subtraction is difficult. Multiplication has no connection to addition, and an understanding of "powers" seems almost out of reach. Naturally, a certain cross section of the students is able to break from old habits and begin to attempt to build an understanding of what they are attempting to learn. These are usually the better students.

I think part of the problem is due to the "practical" aspect which is stressed by our society and which is especially noticeable in the elementary schools. Learning to add or multiply without knowing how or why does not seem to be desirable to me under any circumstances. So often, teachers teach the "short-cuts" and students often do not understand why they work. I even know of one teacher who spent the whole year teaching her eighth graders from *Barron's Preparation for High School Entrance Exams*—not explanations, but merely reporting the answers to her students! The students learned nothing, except a hatred of boring math.

I feel we must get away from the "practical" and introduce students to the "aesthetic," in order to foster interest in mathematics' monumental tribute to man's thinking ability. If the calculator can free a student from tedium, all the better. The challenge is not in calculating, but in learning what it means to calculate, and why it is done in a certain way. Anything less is shortchanging our students. We owe the next generation far more than that.

Thomas J. Kloppenborg, C.M.  
St. John's Seminary  
Kansas City, Mo.

## Scientists and humanists

I was quite intrigued by the recent article, "Science and the Humanities: Bridging the Crosscultural Gap" (SN: 3/15/75, p. 178) which illuminated the fear that scientists and humanists are removed from each other and have no thoughts other than their own. The follow-

ing issue (SN: 3/22/75) offered both an editorial comment and a feature article on the Asilomar gene transplant conference which should offer great hope to refute this disillusionment.

It does in fact point out that the bridge between science and humanities is not only cultural and practical but moral. Hopefully, this is the gene which can be transplanted to technology. For man is driven "genetically" not only to seek but also to control what he needs for survival.

Ironic, isn't it, that a group of nonconforming, eccentric scientists, watched suspiciously by society, are the first to address and affect a policy decision that truly affects "the future of all mankind."

D. L. Hale  
Arlington, Va.

"Science and the Humanities: Bridging the Crosscultural Gap" is surely the farthest out article ever written on the two "cultures." "The artist does not need science to improve his vision." Can this really be? Don't we all need science to improve our concepts so our perceptions will be truer?

C. P. Snow's use of the anthropological (and, at root, religious) word "culture" to describe techniques of cultivating one's attention is where all the trouble arises. Certainly bad art and bad science do split off from each other. But great art is always concerned with cosmology, a consistent view of life and the universe. And great science seems frequently aware of its debt to the compositional, inductive method of procedure, though it must prove its conclusions deductively as well.

John Spillman Jones  
Santa Monica, Calif.

## Cell magnification

I thought you would appreciate my pointing out an error in the March 8 issue on page 155. The electron micrograph of a cell is clearly not magnified by 10 million times. Judging by the size of the mitochondria I imagine that the magnification is around 10,000 x or less. Again judging by the mitochondria the magnification of the micrograph on the front cover is probably around 700,000 to 1 million rather than "millions of times life size."

I have been reading SCIENCE NEWS for over two years and feel that it is an excellent publication.

Ted Dunn  
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