

OFF THE BEAT

Calclatoritis

BY MARCIA F. BARTUSIAK

It finally happened — the day I long feared as a physics student. I was taking a test with my trusty calculator by my side and, without thinking, I actually punched up 200 divided by 2 before putting it on my paper. It didn't take me long to face the ugly truth — I had become a calculator addict, a victim of calclatoritis.

I thought I was the lone victim of this disease until I discussed the symptoms with a fellow student. With relief, he admitted that he, too, had been afraid during a recent test to work out a simple multiplication until he received an electronic blessing from his nine-digit display.

I soon noticed other examples. A professor of mine told me about a student in his beginning physics course who asked for some help on a homework problem. To discover her level of understanding, he asked her how fast a car would be going if it covered 40 miles in 4 hours. She solemnly proceeded to divide 40 by 4 on her calculator before giving him the answer. Later that week, another student spent ten minutes looking for a calculator in the laboratory where I work in order to add up a column of eight numbers. He could have done it by hand in just a minute.

Though my sampling is small, I'm sure this developing fear of performing the simplest arithmetic problems without running to a calculator is not an isolated problem.

Only a few years ago the question of calculators in the classroom was the subject of hot debate. Educators were of two opinions. Half praised the new device for freeing the student from messy computations in order to concentrate on analytical concepts; the other half feared a future generation of mathematical illiterates. But once the National Council of Teachers of Mathematics declared them a "valuable instructional tool," the argument pretty much died down. Educators now seem resigned to the fact that the calculator, like television before it, is here to stay. The fad has become an institution.

But I believe it's time to take another look, especially now that their price makes them affordable to even an elementary school student's budget. Of course, that wasn't always the case.

In the late 1960s, electronic calculating machines (as they were known back then) were expensive oddities bought mainly by businessmen to replace the whirring and

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clacking mechanical models. To the man-in-the-street they were still an unknown.

Only six years ago, it was big news if a pocket calculator with just a few scientific functions went for less than one hundred dollars. Today they can be had for \$9.95 at your local drugstore.

No wonder the industry expects to sell 1.7 billion calculators worldwide this year alone. Arithmetic has gone POP with specialized calculators for electronics, aviation, navigation, business, statistics, supermarketing, and even preschool math skills.

Over and over, educators say they do not view these calculators as a substitute for learning, but what those specialists sometimes overlook is the fact that they can become quite habit forming, particularly outside the classroom where teachers have no control. The result — a bad case of mental laziness. Some students not only lose the desire to work out simple problems by themselves, but they start mistrusting their own answers if a machine isn't nearby to verify it.

Don't get me wrong. I'm not advocating a return to the abacus or even the slide rule. To paraphrase an old Jack Benny joke, if a robber came up and said, "Your calculator or your life," I'd hesitate.

To the student of science, the calculator has opened up a whole new world of problems and challenges. Professors no longer avoid the questions with the messy calculations and with the time saved expect more analytical thinking to boot. Smiles are now on the faces of former math phobics who are finally finding answers instead of mistakes as they add, subtract, multiply and divide to their heart's content.

But one can also envision a further drop in SAT math scores when that generation of students brought up with calculators always an arm's length away must work out the problems with merely paper and pencil. Their lack of practice could lead to a loss in points. Like anything else in life, we need to handle this new addition to our technological life with a little self-control, the ability to determine whether we're using the device to save time or as a crutch to keep us from thinking.

Some futurists say that calculators point the way to new trends in math, making the memorization of multiplication tables and by-hand arithmetic go the way of the horse and buggy. Well, maybe I'm old-fashioned, but the professors I most admire are those who can expound on flying projectiles and twisting electromagnetic fields with only a piece of chalk, a blackboard, and a wave of the hand. Some even go out of their way to avoid pushing a calculator's buttons. It's an art form that I fear may soon be dying a slow death.

Their answers may not be accurate to two decimal points, but the mental activity certainly serves as an exercise for toning up the mind to tackle those problems that may take a computer or two to work out.

What cars did to physical exercise and television did to reading, calculators can very well do to our arithmetical skills if we're not careful. Like avoiding sweets while on a diet, we need to restrain ourselves from jumping to a calculator when either simple figuring in our head or plain paper and pencil will suffice. Believe me, the mental exercise will do our flabby brain muscles a world of good.

What it boils down to is this. Hard as I try, I still cannot picture Albert Einstein hunched over an electronic calculator punching out $E = mc^2$.

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