in Ohio in 1977–78, they increased their math enrollment in the following year by 73% compared to senior math enrollment the year before. More recent surveys show that increased enrollment in senior-year math has been sustained at a level of 40% to 45%. Apparently, when the students have their deficiencies presented to them, with explanations of the potential impact on their college and career goals, they have a powerful motivation to take corrective action while still in high school.

"Raw scores don't have the impact of this type of personalized information," says Joan Leitzel, who participated in the early development of EMPT when she was on the OSU faculty, but has since become division director for education and human resources at the National Science Foundation. "Even though students are inclined to relax during their senior year of high school, they don't like the thought of spending the first year of college taking noncredit courses. And their parents don't like paying for it."

Indeed, EMPT graduates do better on college placement exams than students who haven't participated in the program and, consequently, they need fewer remedial courses. At OSU, for example, about 25% of students from non-EMPT schools need remedial math compared to only about 13% of the program's participants. Largely as a result of EMPT, the percentage of freshman taking the remedial courses at OSU has declined from 47% in the late 1970s to 20% now, says Waits.

And that's saved money for the state. During the late 1970s, says Waits, "The [state] legislature was spending $10 to $12 million annually on remediation at the university level." But the annual cost of EMPT in Ohio is only about $200,000. Although the program was originally funded by OSU and a local Columbus foundation, the Ohio legislature, gratified by the declining need for remedial math, now picks up the modest costs.

The program has other, more intangible benefits as well. One of these is the establishment of a friendly, ongoing dialogue among high school math teachers, guidance counselors, and college math faculty—a marked improvement over the tensions of the 1970s. "Now, university staff tend to look upon high school staff as professional colleagues," says Adcock, still a math teacher at Westland High. "The success of the program has a lot to do with the personalities of the people involved. The OSU people respect the experience of the high school staff."

Although the EMPT focused strictly on math assessment at first, in recent years it has moved on to develop courses and other means of upgrading the abilities of high schoolers. The most recent effort in this regard is a "Calculus Readiness Course," which relies on computers and graphics to encourage problem-solving and give students a more intuitive sense of math. The course helps the students to anticipate the demands of higher math, says Waits.

Kenneth Wilson of OSU, a Nobel laureate in physics, is among those enthusiastic about EMPT's new direction. The program's earliest efforts, which focused on the students in trouble, did nothing, he says, to spur enrollment in graduate level sciences. "But," he predicts, "the latest developments, which encourage interest in precalculus in high school, could generate new majors in the sciences." ■ ANNE SIMON MOFFAT

And the Winner: Cetus Does Own PCR

Round 1 in a David and Goliath struggle between Cetus Corp. and DuPont over the polymerase chain reaction (PCR) is over and the winner is: biotech small fry Cetus. Last week in U.S. District Court in San Francisco, a six-member jury upheld two Cetus patents on the revolutionary technique for amplifying rare DNA sequences that was developed at Cetus in the mid-1980s. The jury failed to buy DuPont's claim that PCR was already in the public domain because it was outlined in papers by a Massachusetts Institute of Technology professor a decade before Cetus developed it.

Now that that verdict is in, Round 2 is coming up: a second trial to determine whether DuPont has been infringing the patents by selling kits and reagents based on the chemical reaction that underlies PCR. If they have, DuPont may have to cough up damages based on its income from the kits.

"PCR has always belonged to Cetus. The jury's verdict completely vindicates our position."

—RONALD CAPE

Last week's decision promises to be a big financial shot in the arm for Cetus. Sooner or later PCR is likely to generate a market worth hundreds of millions of dollars—income Cetus badly needs after the Food and Drug Administration failed last summer to recommend approval for its other promising revenue generator, the recombinant cancer drug interleukin-2.

DuPont's case rested on the argument that PCR had been described in a series of papers from the lab of H. Gobind Khorana in the early 1970s (*Science*, 15 February 1991, p. 739). Although some big-name scientists, including Arthur Kornberg (who won a Nobel Prize for work on the class of enzymes that power PCR), went to bat for DuPont, many biotech analysts felt DuPont had little chance. One reason is that last summer the U.S. Patent Office reexamined the PCR patents and found that the Khorana papers did not invalidate them.

"We still feel the patent office is wrong," says DuPont attorney George Frank. He says DuPont had a particularly "hard row to hoe," since it bore the burden of proof and its arguments were based on highly technical papers that even experts in the field can't agree about.

Cetus, on the other hand, is celebrating a success it says it expected all along. "PCR has always belonged to Cetus," says the company's CEO, Ronald Cape. "The jury's verdict completely vindicates our position."

No date has yet been set for the next trial—on infringement—and Cetus attorney Peter Staple declined to speculate on how large any award for damages might be, although he did note that the amount could be tripled if Cetus can prove DuPont willfully infringed a patent they knew to be valid. In the meantime, Cetus has requested an injunction to keep DuPont from selling its DNA amplification products.

And if two rounds aren't enough for these punch-drunk opponents, there may be yet another rematch—on an aspect of PCR technology not covered in the first trial. In January Cetus filed a suit claiming that DuPont had infringed a recent PCR patent on the use of heat-stable enzymes to streamline DNA amplification. Although the suit was put on hold while the first one went to trial, Staple said, Cetus now expects to push it forward if they have to. ■ MARCIA BARINAGA