Sarah Elgin, a researcher in chromatic structure and its relation to gene expression, began her involvement with elementary science education by serving as a resource for her sons' classrooms. Her experience, however, was that the teaching of science remained haphazard, at the whim of what teachers your child had and what the teachers' interests were. That experience, mirrored by other members of the faculty at Washington University, led to the formation of a very informal group of university faculty and public school teachers working to maintain some consistency in science resources. Today, four years later, this effort has led to funding for a curriculum development project, a successful joint effort between Washington University and the neighboring University City School District, a school district comprised of 80% minority students.

The curriculum development program, which has received funding for the next three years from NIH through SEPA, is working on two modules: Molecular Genetics for grades 9-10 biology, and Environmental Chemistry for grades 10-11 chemistry. Rather than teach "biotechnology" as an add-on after genetics, the project aims to use the tools of molecular biology to teach genetics to first year high school biology students. The goal is to mainstream molecular biology into the basic high school biology course: for many people, high school biology is their only shot at science, the only experience the average citizen has to gain a working knowledge of this important subject. The NIH grant provides funds to support planning and consulting time for the participating teachers, and supports a part-time scientist/writer and curriculum writer for each module; numerous scientists in the St. Louis area are donating their help as consultants.

The Science Outreach Program, now being further developed at Washington University under the direction of Dr. Cynthia Moore, includes a summer course in molecular biology for high school teachers; other courses are being planned. "Molecular Biology: The Gene Revolution," a lecture and lab course taught at Washington University, costs about $18,000 to give for 18 participating teachers; it has been supported by Title II of the Eisenhower Mathematics and Science Education Act. The course is three weeks long and is open at no personal cost to all teachers, including private, parochial, and public school teachers. Once teachers complete the course, they have access to equipment, teaching kits, and resource materials through the program's loaner system, run by cooperation with the St. Louis Mathematics and Science Education Center. To date, 33 teachers have taken this course; most are using the experimental materials with their students.

All three programs share one concept: they are all teacher driven, based on the teachers' needs, not the scientists'. In addition, each is a coming together of professionals: the scientists share scientific knowledge, the teachers share how to get the concepts across to students within the confines of time, safety, available equipment, and different student learning styles.

All of this effort take time... and money. How much time? "I wouldn't even hazard a guess," says Elgin. And money? Sarah Elgin's experience is that it is easier to find
funding for a new project than to find sustaining funds. For example, this coming summer's courses have not yet been funded. "There's a tendency," Elgin explains, "to look for the quick fix. But there is no quick fix in education." Her goal would be to begin with hands-on science at the elementary level where you can easily get the students to feel comfortable with science, and to continue hands-on science until high school graduation. One of the obstacles in finding funds, however, is that one year's worth of hands-on science will not result in immediate, improved test results; this makes it difficult for such programs to win the hearts of school administrators who are under pressure to be accountable through the only means currently available to them—the state or nationally-administered multiple choice test. "We have been very fortunate to work with a school district that is willing to make a real pioneering effort in science education," says Elgin.

Is this much involvement a wise career move? Not really. "It places you in a precarious position," Elgin explains. Some people perceive such activities as a sign that a person is "not serious about their science." In addition, Elgin, who has been a member of the ASCB since 1973, says that she would discourage anyone who is not tenured from getting involved in something like this as deeply as she has; it takes time away from activities more likely to be rewarded by tenure, and can be very seductive—you keep seeing more ways that scientists can help the schools. "I have been fortunate in having an excellent group of graduate students and postdocs working with me in the lab, and this is essential," states Elgin. "Without their continued support and hard work, it would not be possible to maintain our basic research at a productive level while doing normal university work and outreach. My department and university have also been very supportive, but it does create a lot of strains on time and budget."

Then why do it? For Elgin, it comes down to a personal choice: at some point you have to make a decision as to how you want to relate to your children a sense of responsibility. Her advice to those who would like to become involved: start easy and stay laid back about it, don't come off as the expert. Teachers have a great sense of hierarchy and are easily threatened. Go in there and make yourself available by asking the teachers what they need, not telling them what you know and can show.

Sarah Elgin's hope is to see children leave grade school thinking that the world is an ordered place, that they can find out more about it by asking questions and doing experiments, and to leave high school believing also that science is interesting and accessible, not something to fear. Her goal is not necessarily to produce a generation of scientists, but to produce citizens that are comfortable with science. The young scientists we hope for should emerge easily from that group.