

Education

Science and engineering groups to aid precollege education

National efforts to promote better pre-college science education were launched at conferences in Washington DC last year and now are beginning to take shape. This winter the Triangle Coalition—a partnership of business and labor, science and engineering organizations and education groups—has announced its establishment as a formal organization. Established at a midsummer conference last year (see *PHYSICS TODAY*, November, page 103), the Triangle has acquired a small staff that is supported by grants from the Carnegie Corporation and NSF, and it hopes soon to begin collecting dues or voluntary contributions from member societies. The initial objective of the staff, which is headed by John M. Fowler at the National Science Teachers Association, is to provide services and encouragement to groups around the country that wish to form local "alliances" to promote science and engineering education. Meanwhile, at the "Pyramid conference" held at the initiative of the IEEE and several professional engineering societies in early November, it was decided to establish task forces to:

- ▶ form local alliances
- ▶ develop handbooks for action at the community level
- ▶ track Federal legislation pertaining to education in science, mathematics and technology
- ▶ coordinate public information activities
- ▶ and seek support from industry for improved science, math and engineering education.

The groups involved in the Pyramid conference represent engineering and the physical sciences, in the main, while the Triangle Coalition includes all the natural sciences but not engineering.

The organizations involved in both the Triangle and Pyramid efforts currently are gearing up to encourage local groups to initiate activities during National Science Week, 12–18 May (see box). A Triangle-Pyramid committee also has recommended that local groups organize "Science Olympics," in

which contestants would be required to solve challenging problems on the spot. In time, perhaps, local Science Olympics might be organized into a national event.

Decentralized alliances for education would seem to be a timely move, given the growing importance of state funding for education relative to Federal and local funding. Now that state governments are taking a stronger hand in education policy, often limiting the discretionary powers of school districts, decentralized coalitions ought to be in a position to have substantial influence on policy. Many state governments—Texas, Florida, Kentucky, Arkansas and New Jersey, among others—have acted in recent years to improve precollege education by increasing course requirements for graduation, tightening teacher accreditation standards, mandating use of more demanding textbooks and establishing new teacher training programs.

Judith R. Franz, who headed the APS Education Committee in 1983

and 1984, and Bernard G. Silbernagel, head of the APS Panel of Public Affairs in 1985, have taken note of the support various APS and AAPT groups are giving to decentralized alliances and have urged physicists "to participate in education initiatives locally and through their AIP member societies (*PHYSICS TODAY*, January, page 160). In recent years, the APS Education Committee has focused especially on physics education at the high-school level.

Kenneth W. Ford of Molecular Biophysics Technology Inc, the new chairman of the APS Education Committee for 1985, says he expects the committee to remain interested in high-school education, but also to expand its concerns both upward to the college level and downward to elementary- and middle-school levels. Ford considers cooperation among professional societies to be particularly important at the lower grade levels. Elementary school science is not divided by disciplines, Ford observes, and individual societies

National Science Week

NSF and four corporations are cosponsoring "National Science Week," 12–18 May, with the aim of providing "a highly visible and focused framework within which a wide range of science-related programs and activities can take place." According to Mary McDonough Keeney, NSF coordinator for Science Week, activities will be aimed at young people, especially junior-high and high-school students. It is not anticipated that all communities will be able to organize activities in time for Science Week, but NSF officials hope that the groundwork will be laid this year for something that will soon become a true national event.

A number of organizations, including the Triangle Coalition, the National Science Teachers Association and the Council of Scientific Society Presidents, have pledged to help publicize and promote Science Week activities. AAAS has promised to devote an entire issue of *Science*

85 to Science Week and will report on the "The Great Paper Airplane Design Competition," which is to culminate during Science Week. Cosponsors of the competition are AAAS, the Smithsonian Air and Space Museum, and NSF. The Smithsonian and the Association of Science and Technology Centers are to support Science Week with various activities.

A number of events also are planned for Washington DC during Science Week, including the National Science Board's annual dinner where the Alan T. Waterman and Vannevar Bush Awards are made. President Reagan is expected to sign a joint Congressional resolution establishing Science Week as an annual national event.

Last year, AT&T, General Electric, IBM, Dupont and Eastman Kodak sponsored a limited science week in the Washington DC area. This year all but AT&T are cosponsors with NSF of Science Week.

are short on expertise in elementary education. Support for the Triangle and Pyramid efforts also has come from Bassam Z. Shakhshiri, the new assistant director of NSF for science and engineering education (see *PHYSICS TODAY*, January, page 55). In an after-dinner speech to participants in the Pyramid conference last November, Shakhshiri urged members of professional societies to make specific recommendations to local branches, organize presentations on science and engineering for grades 6-8, promote local education in every way possible and, from time to time, "take a science reporter to lunch."

Among the issues causing some confusion at the conference was the relationship of the Pyramid and Triangle groups. Representatives of the IEEE seemed eager to maintain the Pyramid as a distinct effort rather than merge it into the Triangle, mainly to encourage engineering societies to get and stay involved. Each of the engineering societies has a large number of local sections that could be mobilized.

The Pyramid conference ended with a compromise in which the small Triangle staff was given an important role in a number of new task forces, which enabled Fowler of the National Science Teachers Association to keep pressing in the following months for closer cooperation between the two coalitions. In February a letter signed by the president of NSTA and the past-president of IEEE was sent out to approximately 1500 people, urging them to form local alliances, taking as their first task the organization of activities for Science Week. Fowler and Carleton A. Bayless of the IEEE are cochairmen of the joint Triangle-Pyramid task force that drafted the letter.

The toughest issue to emerge in the Pyramid and Triangle discussions, by most accounts, is how best to improve teaching by means of incentives and standards. Everybody agrees that both starting and average teacher salaries are too low by comparison with salaries offered people in business and professions, and there is general concern that teacher salaries peak too early in the career cycle, but nobody knows what to do about it.

Concern about teacher pay is especially acute because of a general impression that the quality of new teachers is continuing to deteriorate, despite all the attention to precollege education. As Lynne Glassman of the National School Boards Association said in an exceptionally informative talk at the Pyramid conference, students who majored in education traditionally "scored lower on standardized achievement tests" than other college-bound high-school seniors, "had lower average school grades and [took] fewer

courses in science and math."

"It is equally as evident that the surge of women into business, law and other professions has drained away many of the brightest women from teaching," Glassman said. "Women continue to make up almost 70% of the teaching force in the US public schools, but much of the cream at the entry level is being skimmed off because of expanded career options for women."

A popular response among scientists and education specialists has been to recommend establishment of "merit pay" or "master teacher" programs, in which ways are found of paying the more effective teachers higher salaries. According to one recent study, all but a dozen states are looking into such programs, and several—Florida, New Jersey, North Carolina, Tennessee and Texas—are trying hard to implement them. It often is hard going, though, as New Jersey education officials have found. In the New Jersey program, meritorious teachers in selected state districts get an extra \$5000 in salary, provided they are willing to spend a month of the summer vacation performing special tasks. But the New Jersey Education Association, the local affiliate of the National Education Association, opposed the program, and in the end, only nine of New Jersey's 600 school districts applied to participate.

The National Education Association strongly opposes introduction of differential pay scales, arguing that such measures introduce an unhealthy kind of competition where in fact more cooperation is needed. NEA's view is that teacher salaries should be substantially boosted across the board and that working conditions for teachers should be improved, in part by providing more opportunities for joint teaching. On the question of whether teachers should be required to meet higher professional standards, NEA officials tend to take evasive positions, saying on the one hand that professionalism is of course a good thing, but that on the other hand most of their members tend to regard "professionalism" as a "code word for doing your job without complaining."

In sessions of the Pyramid's task force on teacher incentives and standards last November, Moses Passer, director of the education division at the American Chemical Society, spoke forcefully for getting the participating groups to back pleas for higher teacher salaries. "If we don't push it, nobody else will," Passer said. In its report to the plenary session, however, the task force took a less bold position. "The activities of this task force will have to be approached cautiously," it said. "It could possibly prod the NEA to come up with solutions that the professional

societies and the public can support, help states evaluate programs such as merit pay, and/or look at certification standards...."

The role of business in the Triangle and Pyramid efforts is another matter that has caused a good deal of discomfort among those involved in the efforts. At the Pyramid conference, it was apparent that some people regarded greater business involvement in education as a means of promoting industry's positions on controversial public issues by taking debate out of the hands of social scientists, policy analysts and politicians and putting it back in the hands of engineers and other technically trained experts. Frequent mention was made at the Pyramid conference of the types of projects businesses often have supported successfully—speakers, donations of lab equipment, direct grants, field trips, "adopt-a-school" programs, clubs, contests, awards, summer employment for teachers and so on. But there also was general unease over the obvious fact that the businesses in a position to help often are not located in the districts that most need assistance. The participants apparently agreed that if industry is to be a significant factor in the Pyramid effort, the professional societies would have to approach the business community with coherent and well-targeted proposals. Lewis Slack, AIP Associate Director for Educational Programs, notes that professional associations can encourage business involvement in two ways. They can ask corporate associates to urge their employees to assist in community education projects. Or the professional associations can ask their own members in industry to urge action on fellow employees and plant managers.

Jarus Quinn, executive director of the Optical Society of America, came away from the Pyramid conference feeling "upbeat" because of the good ideas that were being knocked around but skeptical about "how it would hold together—how you would pay for it." The problem with any effort that relies heavily on volunteerism, Quinn observes, "is that people wear out."

Physicists can take heart from favorable mention AIP and APS get in Triangle and Pyramid documents, which take special note of the news releases AIP prepares for member organizations, the radio spots done for some 500 stations and the videotape shorts for tv news. AIP currently is promoting a high-school poster that urges students to "expand your sphere with a course in physics." Apparently the physics organizations already are doing more for education than many of the other professional societies, but presumably more still can be done, with will and imagination. —ws