

solving problems in this manner.

Naftalin adds that he thinks some of the rivalries between the basic science community, the engineers, and other groups will ultimately be broken down through exposure, as they were, he claims, in the summer panel workshops. "If you put a Berkeley political scientist in the same room with a retired G.E. vice president for 3 days, something's got to give," he says. Both Naftalin and Wenk point out that the individuals involved in the study, who might have been expected to take die-hard positions that RANN threatened the health of NSF and of basic university research, did not do so. And RANN chief Joel Snow points out that the National Science Board, which had expressed sharp concerns over RANN and a year ago was supervising every award of \$5000 on up by RANN, has now relaxed, and reviews RANN only on a program-by-program basis. Evidently, then, the originators and authors of the study feel that the schisms which RANN has in the past revealed, can be mended. In the meantime, as far as COPEP's endorsement of the RANN program goes, the sky is the limit.

—DEBORAH SHAPLEY

## RECENT DEATHS

**Willy E. Baensch**, 79; professor emeritus of radiology, Georgetown University Medical Center; 1 November.

**Lewis N. Brown**, 81; former professor of pharmacy, Columbia University; 20 October.

**Lawrence N. Canjar**, 49; dean, College of Engineering, University of Detroit; 6 November.

**Hans T. Clarke**, 84; former professor of biochemistry, Columbia University; 21 October.

**Ross M. Coxe**, 50; professor of education, University of South Carolina; 17 October.

**W. Gayle Crutchfield**, 72; professor emeritus of neurological surgery, University of Virginia; 31 October.

**Con Fenning**, 67; former professor of physiology, University of Utah; 14 October.

**Joe M. Hopping**, 41; dean, Graduate School, Central Missouri State University; 15 September.

**Richard L. Huntington**, 76; research professor emeritus of chemical engi-

neering, University of Oklahoma; 9 October.

**Walter R. Kirner**, 77; former director of chemistry, National Science Foundation; 7 October.

**G. David Koch**, 69; former professor of geography, Indiana State University; 18 September.

**Solomon Lefschetz**, 88; professor emeritus of mathematics, Princeton University; 5 October.

**Robert H. MacArthur**, 42; professor of biology, Princeton University; 1 November.

**Harlow Shapley**, 86; professor emeritus of astronomy, Harvard University and former president, American Association for the Advancement of Science; 20 October.

**John E. Walsh**, 53; professor of statistics, Southern Methodist University; 24 August.

**Robert C. Williamson**, 84; professor emeritus of physics, University of Florida; 4 September.

**Richard J. Winzler**, 57; professor of chemistry, Florida State University; 28 September.

**John D. Withers**, 50; zoologist and assistant director, American Institute of Biological Sciences; 30 September.

## RESEARCH NEWS

### Fuel Cells: Dispersed Generation of Electricity



The fuel cell was discovered by Sir William Grove in 1839, but it remained little more than a scientific curiosity until the first practical fuel cell was demonstrated 120 years later by Francis T. Bacon and J. C. Frost of Cambridge University. Since that demonstration, fuel cells have been widely used in the space program, but their high cost has effectively precluded their use as earthbound power sources. Only recently has it begun to seem likely that the cost problems could be overcome and that fuel cells could be commercially viable within this decade.

The road to viability has been a strange one. The euphoria of the space program attracted a number of companies into fuel cell development, but disillusionment set in rapidly. It is com-

paratively easy to produce electricity efficiently and for long periods of time when money is no object; it is far harder, they found, to do it when that electricity must compete economically with the relatively cheap product of large commercial generators.

The federal government, furthermore, provided fuel cell research funds almost exclusively for space and military applications, and even those funds dropped from nearly \$16 million in 1963 to about \$3 million in 1970. Unwilling or unable to assume the substantial investment required for commercialization, companies that had so eagerly rushed into fuel cell development quietly abandoned their research programs or reduced them to token operations. At present, only one company is actively pursuing a full-scale commercial fuel cell program—the Pratt & Whitney Aircraft division of

United Aircraft Corporation, East Hartford, Connecticut.

Pratt & Whitney did have some help though. The natural gas industry has supported its effort because fuel cells seem to present an attractive, environmentally sound way to obtain a premium rate of return on natural gas sales by upgrading the gas to electricity. The electrical industry has also provided support because fuel cells promise to be small, clean power sources that can be quickly installed throughout its distribution systems to supplement central power stations without objections from residents or ecologists.

To date, 43 U.S. and three foreign utilities and Pratt & Whitney have invested more than \$50 million to prove the technical feasibility of commercial fuel cells. Roughly twice that amount is expected to be invested by the same groups during the next 3 years in an