

In fact, Chynoweth says, "The size of my operation is almost identical to the size of the research area in Bell Labs when I joined it in 1953." Chynoweth's department started with about 350 people from the old Bell Labs. By the end of next year, he expects to have 480 people in applied research, mostly in the physical sciences, mathematics, computer sciences and electrical engineering. His 1984 budget is \$72 million. Though the focus or mission of Bellcore research is somewhat different from that of AT&T Bell Labs, there is considerable similarity in the areas of science and engineering covered.

The applied-research department is organized into four laboratories:

- Network systems, headed by Eric Nussbaum, will be concerned particularly with network architectures and new wide-band services.

- Network technology, headed by William Warters, will be mostly electrical engineering. It will include research on lightwave applications (pushing frontiers of speed, bandwidth and deployment in the local networks), portable radios and satellite linkage, and investigation of switching techniques (such as packet switching, burst switching and other novel approaches).

- Mathematics, communications and computer science, headed by Henry Pollak, will include areas such as statistics, operations research, human factors, discrete mathematics and economics.

- Solid-state science and technology, headed by John Rowell.

Rowell feels his lab has three responsibilities: One is to provide prototype devices, especially to the labs of Warters and Nussbaum. Second is to help the operating telephone companies directly in their understanding of equipment failures in the field, particularly those that occur in materials and devices as a result of fatigue or natural disasters. The lab's primary mission, says Rowell, "is to maintain a window on the world of research in fields relevant to future technologies of the operating companies. This can only be done by contributing to the fund of knowledge in these fields." He looks to his physics and optical-science division, headed by Paul Liao, and to the materials-science division, headed by Jack Wernick, to be at the forefront in such fields as the optical and electrical properties and synthesis of III-V semiconductors that behave as one- or two-dimensional systems.

Rowell has 100 people working for him now and expects 140 by the end of 1985. His counterpart at Bell Labs, Patel, has close to 300. But the breadth of Rowell's lab, he says, is broader than Patel's. This breadth, some observers note, could be a major difficulty for both Bellcore and Bell Labs—they may

be spreading themselves too thin.

Divestiture has posed a number of unusual transition problems. Prior to the divestiture, many scientists in Rowell's lab collaborated with colleagues who are now at AT&T Bell Labs. In one case where some of the collaborators are not in Penzias's department, AT&T Bell Labs wants to delay publishing results until some time after patents are applied for. Meanwhile, Bellcore would prefer to publish now but must wait. "But these are just transition problems."

In recruiting from the old Bell Labs, says Chynoweth, "Our batting average was about 50%, which indicates that both organizations had comparable attractiveness. Some volunteered, others had to think it over. Both labs were equally entitled to people. It was a sideways separation, negotiating as equals. Both sides were watching to ensure that the separation was indeed equitable. But obviously it was easier to get people to move when we offered promotions."

Support for applied research at Bellcore comes from the seven regional companies, each providing 1/7 of the \$72-million budget. For Bellcore as a whole, 70% is funded project by project. But the cost of all applied research is shared equally, although a single regional company could ask for a special research project, provided the majority agreed. Chynoweth's research area has a research council with a vice president from each of the seven regions; this council votes on the research program.

Each of the four labs under Chynoweth developed the equivalent of proposals, called "work projects." These summarize proposed research programs involving 20 or 30 people, such as physics and optical science. The research council then votes to approve or disapprove the size of each project. Chynoweth is delighted with the strong support the research area is getting from the regions through the research council.

Both Bellcore and Bell Labs are spread over many New Jersey locations at the moment, and they'll probably continue that way. Bellcore will have its headquarters in Livingston. A Morristown site will house many of the people leaving Murray Hill, including 3/4 of applied-research staff. A site near Piscataway-Raritan will house the information-systems staff. A site in Navesink will contain many of the people coming from Holmdel, including 1/4 of the applied-research staff.

For the time being, Murray Hill has a space problem as Bellcore hires new people, who continue to work in Murray Hill. Penzias notes that Bell Labs has major sites in Illinois and in Whippany, Murray Hill and Holmdel. Although the Holmdel building, originally de-

signed by Eero Saarinen (who then also designed the IBM Research Center in Yorktown Heights, NY), was recently expanded, it can't grow any more, says Penzias. "That's a great sign. My guess is that within a few years, we'll have an additional major location."

On a concluding note, Penzias said, "If something good comes out of breaking up AT&T, it would be to show that research is good for competitive business."

—GRL

Ballhaus new director of NASA's Ames Center

William F. Ballhaus Jr., formerly director of astronautics at NASA's Ames Research Center, is the new director of the Center. He succeeds Clarence A. Syvertson, recently retired.

Ballhaus attended the University of California at Berkeley, where he received a BS in 1967, an MS in 1968 and a PhD in engineering in 1971. He came to Ames in 1971, joining what is now the Army Aeromechanics Laboratory at Ames. He was assigned to the Computational Fluid Dynamics Branch. In 1979, he became chief of the Applied Computational Aerodynamics Branch, and in 1980, director of astronautics.

Ballhaus has worked on computational fluid dynamics, in particular, on the development of numerical methods and computer codes for predicting transonic flow fields about aerodynamic configurations.

in brief

Sadeg Faris, who developed the transistor-like superconducting quiteron switch at IBM (PHYSICS TODAY, May 1983, page 19), has announced the formation of a new firm, Hypres Inc. (in Elmsford, New York), which he will serve as president. Hypres will concern itself primarily with development and marketing of ultra-high-speed signal-processing equipment based on superconducting devices such as the quiteron.

The Martin-Marietta Corporation of Bethesda, Maryland, has begun to take over the management of four DOE facilities: Oak Ridge National Laboratory, Oak Ridge Y-12 Plant, Oak Ridge Gaseous Diffusion Plant and Paducah Gaseous Diffusion Plant. The facilities had been operated by Union Carbide, which in 1982 announced its intention to withdraw. A transition period was to be completed by the end of March, at which time Martin-Marietta was to assume full responsibility. □