hadrons. Yamaguchi also has made many original theoretical contributions to strange particles, cosmic ray physics, nuclear physics and pion physics.

Yamaguchi currently is affiliated with Tokai University near Tokyo, having retired from the University of Tokyo, where he completed his doctoral work in 1953. He was director of the Institute for Nuclear Studies of the University of Tokyo from 1983 to 1986, and he was a member of the committee that established the National Laboratory for High Energy Physics (KEK). He has been a member of the physics research committee of Japan's science council and was president of the Physical Society of Japan, 1986–87.

Yamaguchi was a member of the scientific council of the International Centre for Theoretical Physics, 1987–89, and was chair of the International Committee on Future Accelerators, 1987–90. He currently serves on CERN's scientific policy committee.

Miscellany

Because of the exceptional individuals who show up for IUPAP meetings, the conferences are a good place to pick up hints of what is to come in various parts of the world. Among this year's gleanings:

▷ Ossipyan told us that the Academy of Sciences of the USSR has now been put on its own feet as a completely independent organization. Among other things this means that it will have to go, hat in hand, to the central and state legislatures for money. We asked Ossipyan, who also is head of the Institute for Solid State Physics in Chernogolovka, whether Soviet physicists are worried about the prospect of having to rely on the fickle public for support. He said that while the reputation of physics has suffered somewhat because of Chernobyl, he is not too worried.

▷ S. R. Seretlo, dean of the science faculty at the University of Fort Hare in South Africa, said that there was a meeting last July in Harare, Zimbabwe, of people in the basic sciences from all over southern Africa. Seretlo, a Black South African, said that the aim was to identify centers of excellence throughout the region that will be interracial. As a result of the dramatic political changes taking place in South Africa, Seretlo said, there now is a sense that there will be more possibilities for scientific cooperation in southern Africa.

Last but not least in this year's IUPAP news: The two German delegations are being consolidated into a single delegation, which will reduce total national membership in the organization from 43 to 42. The implications of German unification for German physics, and for Europe's general position in pure and applied physics, will be the subject of a forthcoming news report.

—WILLIAM SWEET

SPENCER TAKES REINS AT SEMATECH WITH INTENTION OF WINNING RACE

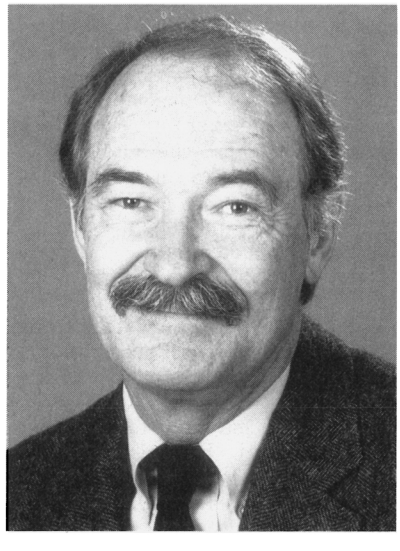
SEMATECH Inc, the US semiconductor consortium, has selected William J. Spencer, group vice president of research at Xerox Corp, to be its president and chief executive. The top position at SEMATECH had been vacant since June, when Robert N. Noyce died of a heart attack.

Spencer said he was prompted to take the job at SEMATECH because of its importance to the US. "I see SEMATECH as an important experiment: We're trying to determine if US companies and the government can collaborate on a business that is critical not only to the semiconductor industry but also to the country."

Spencer, who is a physicist by training, has worked on a variety of semiconductor research projects. After earning a PhD in physics from Kansas State University, he began working at Bell Labs in 1959, studying defects in ferroelectric and piezoelectric materials using x-ray diffraction. He also worked on timing circuits for the early communications satellites, including the Telstar satellite launched in 1962.

From 1973 to 1981 Spencer was at Sandia National Laboratory, where he was involved in building a semiconductor processing facility. After moving to Xerox in 1981, his initial task was to set up a semiconductor processing lab at the company's research center in Palo Alto, California, after which he directed the center. In 1986 he moved to Xerox headquarters in Stamford, Connecticut, to oversee the company's international research operations, which account for about $1.2 billion per year.

William J. Spencer



As head of SEMATECH, Spencer says he hopes to continue the work begun by his predecessor Noyce, who was also a family friend. "Noyce gave SEMATECH credibility and he did an extremely good job of setting its mission and direction," Spencer told PHYSICS TODAY. When he begins his new job this month, Spencer says he expects to spend about half of his time on the road, lobbying in Washington and visiting member companies. Much of the day-to-day business will be left to Turner Hasty, SEMATECH's chief operations officer.

Technical goals

SEMATECH was formed in 1988 by a group of 14 US semiconductor manufacturers to carry out research that would be shared by its members (see PHYSICS TODAY, February 1988, page 51). The consortium has focused on complementary metal-oxide semiconductor technology. So far the consortium boasts of prototype CMOS devices having circuit linewidths of 0.5 microns, built and tested entirely with US equipment. By the end of 1991 the consortium hopes to refine the 0.5-micron technology for manufacturing, with the eventual goal of achieving 0.35-micron chip technology by 1993.

In general SEMATECH has chosen projects that a consortium can do better than any one company, and it has tried to avoid being too narrow in its research focus. "We're really looking at generic technology that all of our member companies can use," Spencer says. Of the 100 or so processes involved in making a chip, SEMATECH has focused on a handful that it considers to be the most critical: optical lithography; manufacturing methods and systems; furnaces and implants; and multilevel metals. Member companies are expected to contribute technical know-how when appropriate; for example, IBM has shared its 4-megabit DRAM

technology and AT&T its 0.8-micron SRAM technology.

Nearly one-half of SEMATECH's $200 million annual budget is spent at its research facility in Austin, Texas, which supports a staff of about 650, half of whom are loaned by the member companies for temporary, two-year assignments. The remainder of the budget is doled out to processing equipment manufacturers to boost their own research efforts. SEMATECH receives $100 million annually from the US government through DARPA, and an equal amount from its members.

SEMATECH is not without its critics. Some don't like the idea of massive government funding of industry, and the Bush Administration has repeatedly tried to avoid giving the impression of setting industrial policy. When the National Advisory Committee on Semiconductors recommended in 1989 immediately upping Sematech's funding by $100 million and giving it an additional appropriation of $800 million over the next three years, the White House promptly rejected the idea. The President's science adviser, D. Allan Bromley, was quoted at the time as saying, "Even if such funding were available, it is unlikely that such an approach would work."

Others fault the consortium on its technical goals, saying they already are out of date. The recent achievement of 0.5-micron-linewidth circuitry trails the Japanese and even IBM, one of SEMATECH's members. But it is the first to be made all on American equipment, says Scott Stevens, a SEMATECH spokesman.

Future goals

SEMATECH's original charter guarantees funding through 1993, but the effort may very well continue beyond that, provided of course that its members and the Federal government continue their support. Sematech management is now working on a long-range plan that will address, among other things, what types of technology will be important beyond 1993. For example, most of the wafer processing now done at SEMATECH is based on optical lithography. But the cutting edge is considered to be either x-ray lithography or direct etching by electron beams, and the large semiconductor firms all have individual efforts in one or both of these areas.

"In the future I think we'll see three strong forces in the industry: Japan, Europe and the US," Spencer says. "We intend to be the strongest of the three."

—JEAN KUMAGAI

JESSI WOUNDED BUT NOT MORTALLY IN RETREAT OF PHILIPS FROM SRAMs

JESSI, the European effort in submicron chip technology organized under the aegis of EUREKA (see PHYSICS TODAY, March 1990, page 67), got a nasty blow in September with the withdrawal from its SRAM project of Philips, Holland's giant in consumer electronics.

The participation by Philips in the program to develop static random-access memories, and in fact JESSI itself, originated several years ago in a Siemens–Philips endeavor called the MegaProject, which was funded by the Dutch and German governments. That project involved the development by Philips of a 1-megabit SRAM and by Siemens of a 4-megabit dynamic random-access chip. Building on the project, Siemens managed to corner about 5% of the world market for DRAMs.

Despite that achievement, it proved increasingly difficult to justify to the Dutch and German publics large government subsidies for huge companies like Siemens and Philips. And so, by a process of consensus building among European scientists and science policy makers, it was decided to give the MegaProject a European imprimatur by putting it under the aegis of EUREKA. Hence JESSI, the Joint European Submicron Silicon Initiative, in which Siemens, Philips and SGS–Thomson were to be the main participants. The specific technical focus of the SRAM part of the JESSI program was to develop techniques for etching 0.5-micron details, in the first phase, then 0.35-micron details in the second phase.

Difficulties at Philips

The first hints of serious trouble came last spring, when it was announced that Philips had suffered a drop in first-quarter earnings of very close of 100%, from about $120 million to $3 million. Not long after that the chairman of Philips, Cornelis J. van der Klugt, was replaced by Jan D. Timmer, who almost immediately cut the Philips work force—which numbers around 300 000 in all—by about 10 000. Promptly, the international business press declared that measure too little, too late.

In particular, the business press said that Philips had done a poor job of getting products to the market, despite pioneering work on videocassette recorders and compact disks. And Timmer was castigated for failing to cut back on work in computers and chips, areas in which the company was said to be getting "clobbered."

The withdrawal of Philips from JESSI's SRAM project still leaves the company the largest manufacturer of integrated circuits in Europe, and roughly tenth worldwide. The company now wishes to concentrate its chip development efforts primarily on chips for applications in consumer electronics, such as high-definition television.

Where does the withdrawal by Philips from SRAMs leave JESSI? The organization has two major programs off and running, a project to develop logic chips and a project in "joint manufacturing science and technology." A third, CAD–FRAME, is about ready to go. CAD–FRAME involves the development of standards for computer-aided design of integrated circuits.

Casting about for funds

Altogether, there are now more than 50 JESSI projects on the books involving about 140 partners, roughly half of them institutes or university groups, half industry teams. Philips still is participating in more than 20 projects, having withdrawn only from the SRAM effort. The SRAM project was budgeted at DM 400 billion (about $265 million) over its whole lifetime, while JESSI as a whole is funded—in theory—at about DM 1 billion per year (about $660 million). The logic, manufacturing and CAD–FRAME programs are in fact fully funded, but the money for them is coming out of the European Community's Esprit budget, which already was dedicated for R&D work in information technology in the first place.

Could cooperation with SEMATECH help compensate for faltering commitments from European companies and governments? Last July, some fourscore scientists and officials from the United States and Europe met in Washington and Brussels to discuss possible areas of research cooperation, and relations between JESSI and SEMATECH were high on the agenda. On 14 September, JESSI put out a press release saying that representatives of the two organizations had met in Austin, Texas, to define mutually beneficial areas of cooperation. So far, however, joint activities of the two organizations have been confined mainly to meditation, study and self-examination.

—WILLIAM SWEET ■