

in use in the world; about two-thirds of those are in the United States.

Only two U.S. manufacturers, Cray Research Inc. and Control Data Corp., build these high-speed computers and account for nearly all worldwide sales. However, last year two Japanese companies, Hitachi Ltd. and Fujitsu Ltd., announced that by early 1984 they will be able to deliver machines that do as many as six times the 100 million calculations per second performed by a Cray 1 model. At the same time, the Japanese government started a national supercomputer project to develop a machine a thousand times faster than current machines.

Early this year, a National Science Foundation report on "Large Scale Computing in Science and Engineering" noted that "the capacity of today's supercomputers is several orders of magnitude too small for problems of current urgency in science, engineering and technology." In addition, "important segments of the research and defense communities lack effective access to supercomputers," the study stated.

"U.S. leadership in supercomputing is crucial for the advancement of science and technology, and therefore, for economic and national security," the report warned. "Under current conditions there is little likelihood that the U.S. will lead in the development and application of this new generation of machines."

Last week's White House initiative is a belated attempt to organize federal supercomputer efforts. One group will examine ways in which the government's own needs for supercomputers can be used to encourage their continued development by existing manufacturers. A second group is studying ways to make supercomputers more widely available to qualified U.S. researchers. Both groups are led by personnel from the Department of Energy's Office of Energy Research. A third group, under the Defense Advanced Research Projects Agency (DARPA), will lead efforts to stimulate the exchange of information on research being supported by the various agencies in supercomputer-related fields.

The White House proposal, however, is strictly organizational. The administration is not allocating additional funds for these efforts. Nevertheless, DARPA has asked for an additional \$50 million for the coming fiscal year "to develop the new generation of supercomputers" with enhanced defense system capabilities.

George A. Keyworth II, presidential science adviser, said, "Our national interests require that we maintain a dependable domestic capability to meet our needs. We can't permit foreign manufacturers, whose development costs may be heavily subsidized by their governments, to jeopardize that capability." —*I. Peterson*

## Lubricating distressed lungs

A promising new treatment has been found for respiratory distress syndrome, which afflicts one out of every seven babies born prematurely in the United States and which kills some 9,000 newborns in the United States each year.

It consists of giving human lung surfactant—a lubricant naturally present in the lungs—in conjunction with delivery of oxygen and air under pressure into the windpipe, the conventional treatment for the syndrome. The new combination therapy appears to counter the syndrome better than the conventional one alone does and also appears to lessen the dangers of lung damage.

The treatment has been developed by T. Allen Merritt, Mikko Hallman and Louis Gluck of the University of California Medical Center in San Diego and by Charles G. Cochrane of the Scripps Medical Research Institute in La Jolla, Calif. They presented their findings last week at a meeting of the Society of Pediatric Research in Washington, D.C.

Normally a fetus's lungs start making human surfactant during the last several weeks it is in the womb. Then, after birth, the surfactant helps keep the tiny air sacs in the lungs from sticking together after each breath. But when a baby is born prematurely, it often has not yet produced enough of this substance, and respiratory distress syndrome can develop. Merritt and his team thought that if they could provide respiratory distress patients with supplements of human lung surfactant along with conventional therapy it might counter the disease even more than conventional therapy.

They knew that fetuses born at full term have already made not just enough of the material for their lungs but an excess, which is excreted into the amniotic fluid—the bag of waters surrounding the fetus in the womb. They reasoned that they might be able to extract enough human lung surfactant from the amniotic fluid of full-term newborns to treat newborns with respiratory distress.

They were able to harvest ample supplies of human lung surfactant from the amniotic fluid of full-term infants born by Caesarian section. They passed the harvested surfactant, along with oxygen and air, into the windpipes of nine newborns with respiratory distress and compared their outcome with that of 17 newborns with respiratory distress who got only oxygen and air. X-ray and blood analyses showed that within minutes after getting surfactant, treated infants breathed much better than control patients did. What's more, because treated patients breathed better, their need for oxygen therapy was considerably reduced, and thereby the danger of a side effect of oxy-

## Denying visas to stop technology export

The State Department announced last week that it will deny or put limits on visas for foreigners suspected of wanting to visit the United States to steal sensitive technology. This new policy is part of the Reagan administration's effort to staunch the flow of advanced technology having potential military applications to Soviet bloc countries (SN: 4/2/83, p. 218).

William J. Schneider, under secretary of state for security assistance, science and technology, said the policy will cover not only Soviet and Eastern European visa applicants but also residents of allied countries who may be diverting sensitive information to the Soviet Union and its satellites. The State Department will make decisions on visas based on information, which identifies potential technology thieves, from intelligence sources and enforcement agencies like the Federal Bureau of Investigation and the U.S. Customs Service. Although the government already has the authority to deny visas, fear of technology theft is a new criterion for refusing applications.

In the case of scientists involved in scientific exchanges, State Department officials say that the new policy will affect only a fairly small range of cases involving technology that is already controlled for national security reasons under laws like the Export Administration Act. "It doesn't necessarily mean people are going to be

automatically denied visas... but it may lead to greater scrutiny of cases of this sort," says one official.

Under certain conditions, instead of denying visas, the government may grant visas with restrictions. In the past, these restrictions on a visitor's activities have been informal and "of a nonregulatory nature." The new policy expands that practice so that the restrictions on terms of entry into the United States can also be "formal and regulatory," when appropriate. A formal restriction amounts to listing specifically places like research institutions or commercial facilities where a visitor may not go or activities in which the visitor may not participate. The restrictions would be made known to the host institutions or organizations and to all of the relevant U.S. government agencies. Individuals violating their terms of entry could be detained or even deported.

Michael Marks, assistant to Schneider, says the policy decision was made after an extensive interagency review of technology export problems. "The legislation has not changed," Marks says. "There was a decision to use tools that were there that really hadn't been used that much before."

A National Science Foundation official comments that how the new policy affects science will depend on how it's implemented. The policy is already in effect.

—*I. Peterson*