lachians (SN: 6/9/79, p. 374; 10/20/79, p. 265), but there the record of stretching, or extension, seen in the Basin and Range is not observed.

The mechanics of extension along detachment planes remain "enigmatic," Allmendinger reported. There is abundant evidence that the crust pulls apart on very low-angle faults, but it "appears mechanically impossible," he said. If, as expected, the crust becomes weaker as it is stretched, it would seem more likely that the slabs would break up into blocks bounded by steep faults. The COCORP reflections show that this is not the case.

The COCORP data are obtained when pads on the trucks pound the ground, sending seismic waves vibrating through the earth. When the waves reach the Moho, their echoes are reflected back to thousands of small seismometers spaced along the route and relayed back to a truck where the information is recorded. While the seismic profiles are invaluable in discerning details of the continental crust, they leave many questions for scientists to ponder. For instance, no one can say exactly what caused motion on the faults to reverse. It may be related to the end of subduction of the Pacific Plate along what now is the California coast, and to the activation of the San Andreas fault, which cuts from north to south.

One provocative — and highly speculative — outcome of the recent survey is the possibility that the thinness of the crust in the Basin and Range may not be due to this episode of stretching, but instead was caused by the previous period of thrusting and compression. The classical view of the Moho is that it represents a change in composition from the silica-rich material of the crust to mantle material, which is called ultra-mafic. Oliver says that instead (in some locations) the lowermost slab may have been subjected to so much pressure by the heavy slabs rammed on top of it that it may have subsided. Exposed to high temperatures and pressure, the minerals in the slab might have changed phase — become other kinds of minerals but with the same basic chemistry. A phase change, like a change in chemical composition, would affect the seismic and physical properties of the minerals. At that point, Oliver suggests, "it might be that some of the crustal rocks would turn into something that we would identify as mantle." Such a change would result in a thinner crust.

If this finding can be substantiated, it would lead geologists to revise their view of the Moho. Doug Nelson, a Cornell researcher and a COCORP research associate, says that if a phase change can be demonstrated through petrology and geochemistry, "it would be a very dramatic result" that would change views of the continental crust and how it evolved. "It will be interesting either way it goes," he says. "We're all enthused with this data set."

—C. Simon

Help wanted: To seek an asteroid's moon

Do some asteroids have their own satellites? There have certainly been some tantalizing hints. On several occasions, astronomers watching a star apparently blink off and on as an asteroid passed in front of it have noted brief "secondary blinks" shortly before or after the main event, as though other objects in the asteroid's vicinity were getting in the way. Yet the possibility has been a matter of controversy for years, even as the list of asteroids with possible "companions" has continued to grow. The reason is that the evidence has always been frustratingly inconclusive, usually because the observers were too few or too close together to provide differing viewing angles that would confirm that a secondary event indeed represented an object orbiting the asteroid, rather than some unrelated object that merely happened to be crossing the line of sight.

Late this month, however, there may finally come a chance to confirm the existence of at least one such asteroidal moon — if enough observers, from professionals with specialized instruments to rank amateurs with binoculars, will join in the cause.

On Saturday night, May 28-29, a star known as 1 Vulpeculae will be briefly occulted, or blocked out, by the large asteroid Pallas, at least to observers (who will be legion) along a narrow path across the southernmost United States and northwest Mexico. The position of this primary occultation track is well known in advance, based on calculations of the asteroid's orbit. But if Pallas has a moon, *that* occultation may turn out to be visible only from as yet unknown locations somewhere in a wide area that includes almost all of North, Central and South America as well as parts of Africa. And the signs that Pallas indeed has a moon include what has been called "the best evidence yet."

Various secondary occultations near Pallas were reported in the early 1970s, and another in 1978, says David Dunham of the International Occultation Timing Association, which encourages and coordinates such observations. But in 1980, E.K. Hege and colleagues from Steward Observatory in Arizona produced an image by a technique called speckle interferometry (unrelated to occultations), in which the asteroid appeared to have a bulge on one side, as though another object were present but too small and nearby to be separately resolved by the telescope (SN: 11/8/80, p. 295).

The occultation track of such a moon is unknown because the rotation axis of Pallas (and the plane of the suspect moon's orbit) is nearly pole-on to the earth. Thus Dunham and others hope that observers throughout the country will try to spot a secondary blink, even from sites where the main blink is not visible. Interested

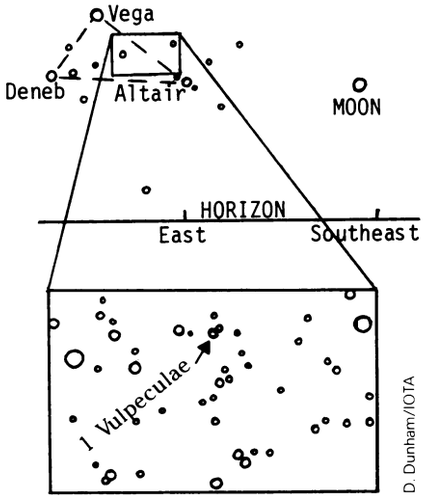

Diagram shows position of star that may be occulted by a moon of asteroid Pallas.

watchers should look at 1 Vulpeculae (binoculars will do) for about 15 minutes, starting at 12:50 a.m. EDT on May 29. The star is located within the "Summer Triangle" formed by the bright stars Vega, Deneb and Altair (see diagram). But establishing the time of such a blink is critical in combining the observations. Set a digital watch (to the second) from WWV shortwave broadcasts or an accurate telephone time source (the U.S. Naval Observatory's is 202-653-1800 in Washington), and dictate your starting, ending and observed occultation times to a tape recorder (or an assistant) as you look. Indicate your location to within 200 feet if possible (such as by reference to a street intersection), and send your report to IOTA, Box 596, Tinley Park, Ill., 60477. Help discover a moon. And watch this space.

—J. Eberhart

Oversight groups for supercomputers

Three government study groups will oversee the federal role in developing and using new "supercomputers," the White House announced last week. The move is part of an effort to keep U.S. supercomputer technology ahead of foreign competition, particularly from Japan.

Supercomputers are the fastest and most powerful scientific computers available. These computers have special characteristics that allow them to perform calculations up to 80 times as fast as the largest general-purpose computers. Supercomputers are used in weather forecasting, scientific research, aircraft and weapons design, seismic data analysis and even for animation and special effects in filmmaking. About 60 supercomputers are

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*

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.*

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-