

ate critics to doubt the possibility of keeping the ABM down even to its projected \$7 billion or \$8 billion. Senator Albert Gore (D-Tenn.) calls President Nixon's new Sentinel plan "but the camel's nose under the tent." His Foreign Relations disarmament subcommittee was scheduled to hold further hearings on the ABM last week.

Beyond removing the pressure of local opposition to ABM sites, the Nixon modification continues to be open to the same criticisms that the old Johnson plan received. These include:

- Misgivings about the effect of deployment on potential non-nuclear signers of the non-proliferation treaty (SN: 2/22, p. 184). The treaty pledges the nuclear signers to make moves toward disarmament. President Nixon said the fact that his ABM plan would beef up the U.S. deterrent would mean that non-nuclear nations could rely on it and wouldn't need their own. But that isn't at issue among nations such as Japan and India, who have the capability to build nuclear weapons and have not yet signed the treaty. On the contrary, their position is that unless they start now, or unless the nuclear nations ease off, the technology will get so far ahead of them that they could never catch up.

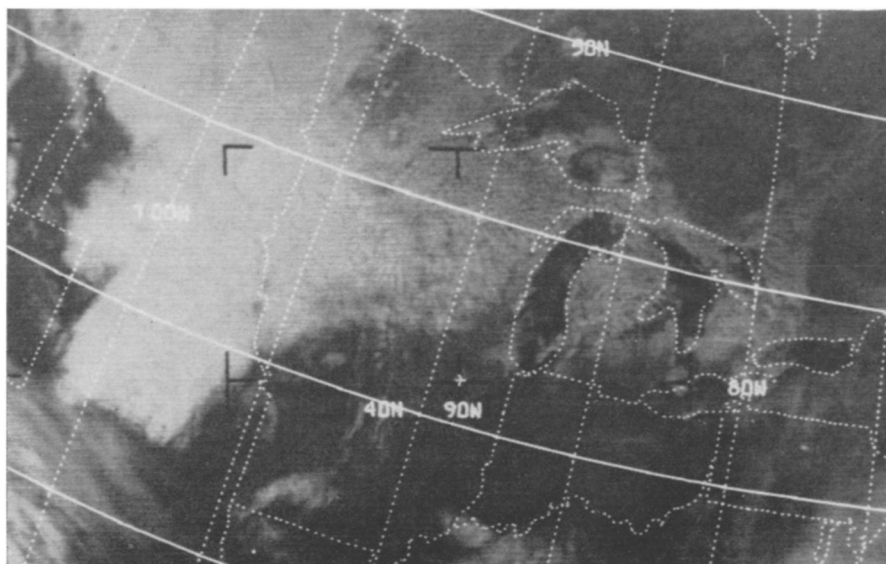
- Doubts about the ability of the ABM to defend cities even against a powderpuff attack from China or Russia. This argument is actually strengthened by the fact that the missiles are being moved away from population centers, since it means that the Sprint, which must be relatively close to the area it is defending, would probably not be of much use. Although all 12 sites would be armed with Sprints, city defense would depend largely on Spartan missiles, which are vulnerable to such countermeasures as decoys or radar blackout.

- Questions about the need for increasing the deterrent immediately. Since deploying more Minutemen would take only two years, compared to four or five for Sentinel, the former route would make it possible to wait until disarmament talks got started and still meet a 1973 threat.

Nevertheless, the fact remains that the Soviet Union is building an ABM and the U.S., up to now, is not. As President Nixon said in announcing his decision, deployment now will allow for such modifications and improvements in the system that are shown to be necessary in actually building the missiles. Such problems do not always show up on the drawing board. Pentagon officials speak hopefully of improved radar techniques and other advances that would develop as a result of a deployment that moved ahead gradually, with annual reviews. ◇

SPRING FLOODS

Now it can be foretold



ESSA

Threatening snow extends from Great Lakes south to Kansas, west to Montana.

In times not very long past, spring floods in the Mississippi basin were inevitable disasters. Like tornadoes, they were expected, though time and place were unknown. Being at the wrong place at the wrong time meant being wiped out.

With the growth of a fine network of meteorological sampling stations came a degree of improvement. The factors that build floods—soil moisture, snow depth, spring temperatures and so on—became known. Theoretically the Weather Bureau had the data to be able to predict quite accurately the flood's time and place.

In practice, however, the mass of data was so great and the interaction of factors so complex that the sliderule-and-pencil work required to make a prediction took weeks. By the time the forecast was made, in many cases, residents of threatened areas could do little but climb on the roof.

Two or three years ago the Weather Bureau's Office of Hydrology, which makes the flood forecasts, began computerizing. Now the process is about complete, just in time to predict the worst potential flood in two decades.

Severe storms during the past winter left a record snowpack covering Minnesota, Wisconsin, and parts of North and South Dakota, Nebraska and Iowa. The record is not in snow depth but in the water equivalent of the pack—the point that counts when the pack melts and fills the drainage system. In 1965—a year in which there was severe flooding of the upper Mississippi valley—the water equivalent of the snowpack was not up to what it is now throughout most of northern Min-

nesota; in southern Minnesota, the Dakotas, Iowa and Wisconsin, there are many places where the water equivalent of this snowpack is four or five times what it was in 1965.

But there is an ameliorating difference. In 1965 the Weather Bureau was able to give a few days warning at most. This year the region has had as much as four weeks notice of the probability of floods. On Feb. 20 the Office of Hydrology announced that "a very serious spring snowmelt flood potential exists for much of the northcentral part of the nation during late March and April. Conditions warrant preparation for major damaging floods of record or near record proportions."

The warning was repeated Feb. 27 with the notations that moderate to heavy snowfall had been added to the already huge snowpack and that on the fringes of the snowpack, where some melting was taking place, melt water and ice jams had already caused some flooding. "The pattern of melting temperatures . . ." said the warning, "is critical and the severity of anticipated flooding could be reduced by an early and prolonged melt period. However, past experience indicates that with such a huge snowpack this would appear to be unlikely."

The Office of Hydrology says wide areas of Minnesota, Wisconsin, Iowa, Nebraska, the Dakotas and Montana will flood. California, Oregon, Washington and Idaho may flood if melt conditions are right; streams will be bank-full in any case. Northern Michigan, largely unpopulated, will flood. Maine and northern New England may flood, especially if any rainfall is added