

METEOROLOGY

Russians Learn From U.S.

► **RUSSIAN METEOROLOGISTS** are learning about weather satellites from the United States, Dr. Konstantin T. Logvinov, Deputy Director of the USSR Hydrometeorological Service, reported.

The Russians presently have no weather satellites. Dr. Logvinov could not say whether Soviet space plans will include such satellites, but he emphasized his country's desire to cooperate with the United States in this area of space research.

Although both sides are willing to cooperate, Dr. Logvinov did not specify any plan of action.

Soviet meteorological efforts in space are largely confined to rocket soundings. Dr. Logvinov reviewed some of these activities and results in a paper presented at the first International Symposium on Rocket and Satellite Meteorology meeting in Washington, D. C.

While the information presented by the Soviet scientist did not reveal anything spectacular, his attendance at the symposium is considered very significant in advancing international cooperation. Soviet scientists often have been conspicuously absent from international meteorological conferences held in the U.S.

In March, following the successful orbit of Astronaut John H. Glenn Jr., Dr. Harry Wexler, chief of research for the U.S. Weather Bureau, met in Geneva with Dr.

Victor A. Bugayev, director of the Central Forecasting Institute of the USSR, to work out a program for international cooperation in space to advance weather forecast capabilities. The meeting was sponsored by a resolution of the United Nations; and, according to Dr. Wexler, it was successful and productive.

A report of the meeting and draft of the program proposed by the two are being completed for review by experts from the World Meteorological Organization and the United Nations. It offers what Dr. Wexler has termed "a grand design for satellite World Weather Watch." This would mean a continuing observation of weather phenomena with a world forecast center to relay all information to all nations.

The program goes beyond satellite aspects and would include readout stations for international use in both East and West.

Dr. Logvinov could not say whether such readout stations will be part of the Soviet cooperative weather research effort, but Dr. Wexler declared that both scientists did see "eye to eye" on the international program.

Dr. Wexler noted that the Russians have been cooperating through the World Meteorological Organization for many years and that an extension of this cooperation in space is expected as a "natural outgrowth."

• Science News Letter, 81:277 May 5, 1962

METEOROLOGY

Map Ice by Satellite

► **FUTURE WEATHER SATELLITES** will likely be able to map the ice around both the North and South Poles, a survey of ice in the St. Lawrence River by satellite and airplane photography indicates.

This could be accomplished by satellites spinning around the earth over the poles, possibly the planned Nimbus satellites. Pictures from the Nimbus would be used for charting the polar ice from day to day at weather stations. These charts would be most valuable for ships traveling in polar waters.

Dr. David Q. Wark, chief of physical meteorology section of the U.S. Weather Bureau, told *SCIENCE SERVICE* that a survey completed April 16 showed how much significant detail can be seen of the ice patterns from the Tiros TV pictures.

He said TV photographs taken by the Tiros weather satellites were compared with pictures taken on the same day by airplanes of the ice-covered St. Lawrence. The Weather Bureau had also received weather and ice information from ships and commercial airplanes in the area.

Comparisons of the pictures together with the additional information proved that individual objects as small as one mile across could be seen on the Tiros pictures. Patterns from certain types of ice could also be distinguished.

He said pack ice shows no patterns because it is not broken up. But broken ice, blown by wind or carried by tides and called belts and patches, is driven into observable patterns. Between these, large pieces sometimes several miles in diameter, floe type ice, can be seen.

Dr. Wark reported on the ice survey to the International Symposium on Rocket and Satellite Meteorology in Washington, D. C. His paper was written in cooperation with Robert W. Popham, also of the Weather Bureau.

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SPACE

Dust Storms May Peril Explorers on the Moon

► **VIOLENT DUST STORMS** from micrometeorites slamming into the lunar surface may be a serious hazard for man when he gets to the moon, a research scientist at the National Aeronautics and Space Administration's Ames Research Center, Moffett Field, Calif., told *SCIENCE SERVICE*.

Surfaces representative of the moon have been impacted with fast moving pellets at the Center's hypervelocity ballistic range branch in a series of experiments conducted by NASA scientist, James L. Summers.

"We found that from one primary par-

ticle or pellet impacting salt rock, sandstone and various other targets, tens of thousands of secondary particles are thrown around. This means that it is very possible that explorers on the moon will be subjected to sandstorms of intensities many times the magnitude of any experienced on earth," he said.

The gravitational pull of the moon attracts more micrometeorites than an astronaut would encounter traveling through space. The lunar pioneer will be safe from the sandstorms and from the striking micrometeorites as long as he stays in his space vehicle, the Ames scientist said.

"On the basis of our impact studies, we have demonstrated that as far as the spacecraft is concerned, it can be protected adequately against the micrometeorites with lightweight shielding. We have not yet developed a means of protecting the individual once he emerges from the vehicle to explore the lunar surface; but we are giving some thought to suits that will be micrometeorite-proof," he said.

However, at this stage of the art a small capsule type lunar mobile for the space explorer seems more feasible.

The impact studies at Ames appear to give substance to the school of lunar thought represented by Dr. Thomas Gold of Cornell University who has theorized that the lunar surface is thickly covered with dust and sand, possibly to a depth of several feet. Others, notably Dr. Harold Urey of the University of California, La Jolla, believe the first man on the moon will find the surface largely exposed rock.

• Science News Letter, 81:277 May 5, 1962



OLD FAITHFUL PUT TO USE—
Physicists of the Boeing Company, Seattle, Wash., salted the steam of the Yellowstone Park geyser with silver iodide to form cirrus-like ice clouds as part of studies for the first quantitative data on clouds as reflectors of light and infrared radiation.