"is performed in a very restricted zone —quite near to the very surface of our small planet. Even bacteria are known to disappear in the upper reaches of the atmosphere, and other life extends downward only to the limits set by the ocean depths. At no earlier time in the earth's history does this seem to have been different. Fossil remains of living things are found in coal and rock strata now some thousands of feet beneath the soil on which we walk, but it is clear that these veins were land surfaces or ocean floors when they trapped the dead bodies of organisms.

"If, in an Arabian Night's excursion, we might leave the earth and look at the present living world from afar—say, from the 24,000 miles which is one-tenth of the distance to the moon—we could rightly sense the narrow pinions of life. Then, on the great sphere which would nearly fill our view to east or west, we should see all life imprisoned in a thin film—a living skin—tightly fitted to the very surface of the earth. As we now know it the entire story of life sticks to the place where there is liquid water, with earthly salts dissolved in it; where gaseous oxygen, carbon dioxide and nitrogen abound; and where surfaces can absorb sunlight for a continuous flow of free energy."

Science News Letter, January 21, 1939

PHYSICS

Fluffiest Snow Known Reported From Blue Hill

WHAT is believed to be the fluffiest snow on scientific record is reported by Prof. C. F. Brooks of Harvard University.

It fell at Milton, Mass., where Harvard's meteorological station, the Blue Hill Observatory, is located. There was only half an inch of it, and it took three hours for it to accumulate, for the flakes fell very slowly—less than two feet per second.

Prof. Brooks blocked out a square yard of it, as it lay on the hard crust of an earlier snow. He packed it into snowballs and weighed it. He found that the water equivalent was only 1/63; that is, it would have required 63 inches of this snow to make one inch of water. Ordinary snow has a water equivalent averaging 1/10, and the fluffiest snows commonly observed range from 1/20 to 1/30.

Prof. Brooks, through the *Bulletin of the American Meteorological Society*, (Nov. 1938), asks if any one has ever made an accurate observation of snow any fluffier than his downy 1/63 variety.

Science News Letter, January 21, 1939

PHYSICS—PHOTOGRAPHY

Nature's Jewels, Snowflakes, Are Copied in the Laboratory

Japanese Scientist Creates Lovely Water Crystals For the First Time By Imitating Natural Conditions

See Front Cover

SNOWFLAKES have fallen in uncountable, unimaginable billions since winter first came to the earth. The bounty of nature in these miniature pearly stars has been unlimited. Now, however, they are being made "synthetically" for the first time.

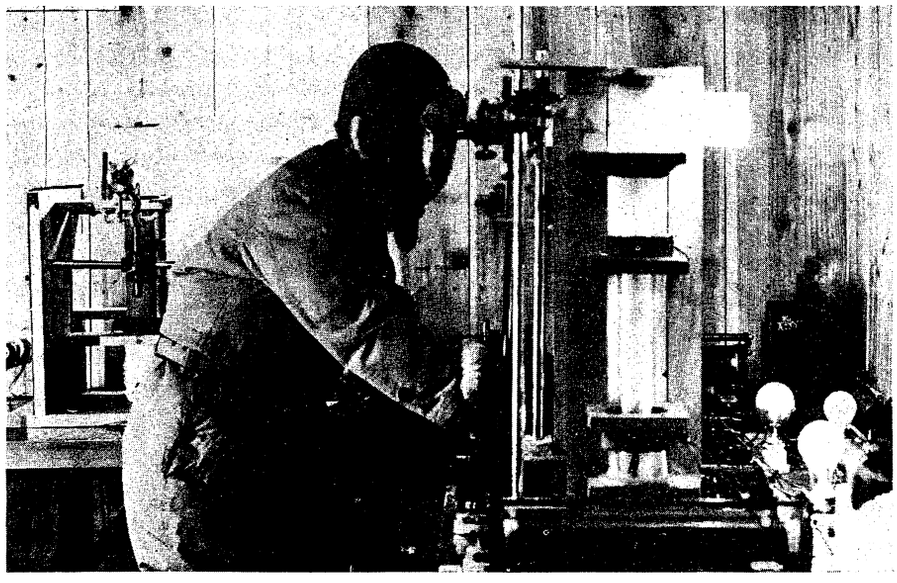
In an unheated, shed-like board building, Prof. Ukitiro Nakaya of Hokkaido University, Sapporo, Japan, makes snow crystals to order, producing them either "plain" or "fancy" as he desires. He measures, photographs, and studies them for the information they can yield in the solution of baffling puzzles in meteorology, the science of the weather.

It gets cold in Sapporo. That city is the northernmost of the more important Japanese centers of population, and is in about the same latitude as Vladivostok. So Prof. Nakaya wears a fur-lined aviator's suit while he is at work.

The Japanese physicist makes snowflakes that rival the natural product by imitating the method of nature as closely as can be done in less space than the whole sky. To make a snowflake, three things are necessary; a supply of moist air, some small solid object on which condensation can start, and a relatively quick drop in temperature to set the process going.

Prof. Nakaya provides the moist air by heating a vessel of water with an electric coil. The warm, saturated air rises through a chimney-like glass tube. This is enclosed within a larger glass tube, which continues above the end of the chimney into a cold chamber, where the temperature can be pushed down to 60 degrees below zero Fahrenheit.

Under natural conditions the tiny solid particles on which snow crystals start to condense are microscopic dust grains, salt particles, etc., floating in the atmosphere. To hold his synthetic snow crystals still, so they will "stay put" while he observes and measures them, Prof. Nakaya



MAKER OF SNOWFLAKES

Prof. Ukitiro Nakaya of Hokkaido University peers through a horizontal microscope at a crystal forming in the cold chamber of the apparatus before him. Since the laboratory must be kept unheated, the Japanese physicist wears a fur-lined flying suit.