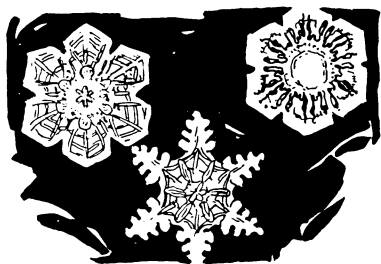


METEOROLOGY
NATURE RAMBLINGS
 by Frank Thone



Falling Frozen Water

UNFROZEN water falling from the clouds always comes down in the form of drops. These may be large or small, but they are always simple round drops, whether in rain, drizzle or fog.

Falling frozen water, however, presents an entirely different picture. It can come down in at least four distinctive forms, each with its own underlying set of physical causes.

Most familiar, of course, is snow. Snow is frozen as it forms and stays frozen all the way down. A snowflake begins like a raindrop, with the condensation of atmospheric water vapor on some tiny solid nucleus, like a microscopic dust grain or salt crystal. But the precipitated water is solid and crystalline itself, and it continues to accumulate crystalline additions, always in a symmetrical six-sided pattern. No two

snow crystals have ever been seen that were exactly alike.

Next to snow, hail is probably the most familiar kind of frozen precipitation. Although hailstones are by far the biggest particles of frozen water (indeed, sometimes they are downright chunks!) hail practically never falls in winter. That is because the peculiar rolling turbulence in the atmosphere necessary for hailstone formation depends on rising currents of heated air, which of course are not likely to happen in winter. Hailstones are recognizable by their onion-layered structure, caused by the freezing of fresh additions of water to their outside surfaces every time they are tossed upward through a stratum of cold air.

Small pellets of clear ice that sometimes fall in winter are sometimes mis-called hail, but are really sleet. They are simply raindrops formed in a warm air stratum aloft, frozen as they fall through cold air on the way to earth.

Another kind of frozen pellet, white and "sugary" in appearance instead of clear, is believed to consist of snowflakes, partially thawed in a layer of warm air, then re-frozen in a lower cold layer. There is no common English name for this, but the German name, graupel, is (*mirabile dictu!*) short, convenient and easy to pronounce, so American weather men have generally adopted it.

The sheathing ice that sometimes forms on the ground and all surface objects is often called sleet, but its proper name is glaze. It is the result of nearly-frozen rain falling on surfaces which are below freezing temperature.

Science News Letter, January 11, 1941

way, there is a repulsion between them and thus they will never come together. Their average speed, he explained, is about two or three miles per hour.

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ASTRONOMY

Newly Found Force Is 200 Times That of Gravity

A NEWLY discovered force, 200 times as effective as gravity, was announced to the American Astronomical Society, meeting at the Franklin Institute, Philadelphia.

Dr. Lyman Spitzer, Jr., of Yale University Observatory, told of this attraction, which acts on minute particles of dust between the stars. It is really a consequence of a well-known effect—the same pressure of light that makes a comet tail point away from the sun.

Such radiation pressure pushes on the dust particles in space. When two different pieces are in line with the body from

which light is coming, the first one absorbs light that would go to the other, and hence tends to approach the second. The force of this attraction is 200 times as great as their gravitational pull on each other, he stated.

With only two particles, this force would not be appreciable, but there is a great deal of material between the stars, and the attraction has to be considered in studying the behavior and distribution of interstellar matter, it was declared.

Each particle, he said, has a negative electrical charge of about two volts potential. Since they are charged the same