



Fragile Individualists

➤ **SNOW CRYSTALS** by the trillions have fallen from gray skies through all the millions of winters this old earth has seen. Yet it is most probable that no two in all those countless hosts have ever been exactly alike. Certainly no two snowflakes in the many thousands that have been examined by scientists have ever been identical.

There is, indeed, in the manner in which snow crystals are formed, easy enough chance for infinite variety. They start as raindrops start, with the attachment of water molecules to nuclei in the clouds.

These nuclei may be almost any kind of particle—microscopic grains of dust, minute salt crystals. Snow crystals differ from forming raindrops, of course, in that the change is from water vapor to the solid, or ice, phase rather than to liquid.

Basic crystal pattern of solidifying water is a hexagonal plate. The first few molecules electrically seized by the nuclei presumably arrange themselves in a six-sided pattern. But water molecules are exceedingly minute, and by the time some hundreds of millions of them have assembled to form even a little snow crystal, the interplay of forces in even that small frame of action can have worked out a pattern that has never existed before.

There are, however, certain family resemblances among snow crystals, which

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you undoubtedly have noticed if your study has been no more ambitious than a casual glance at white bits falling on your coat.

Some of the fragile jewels of the snow are exceedingly intricate and lacy in outline, others are of a more severely simple pattern, still others are intermediate in the elaborateness of their structure. Very rarely are two classes of crystals seen during the same snowstorm.

Differences in size of snow crystals, which are correlated with differences in the intricacy of their patterns, are believed to be related with the heights, and hence the temperatures, of their formation.

The smallest crystals, which have a doric simplicity of outline, fall from the highest clouds. The largest and laciest crystals are the product of lower altitudes, where there is plenty of moisture but temperatures are very far below the ordinary freezing temperatures as we know them at ground level. Graceful intermediate patterns, neither very severe nor yet over-elaborate, come from the middle heights.

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TECHNOLOGY

Snow Removal Methods

➤ **IN SPITE** of new methods of clearing snow from walks and streets the snow shovel is not yet obsolete. Neither are the snowplows and scrapers that pile the city snow in the gutters to become a nuisance for many days if cold weather continues or removal steps are not taken. The new methods developed are not all ready for general use.

Science seems to think the best way to remove snow from city streets and sidewalks is by melting it so that it will take itself away as water through the drainage system. One method is to have the fire department flush the streets with city water. If the weather is cold the method has little success. Salt water from the city harbor is more effective in cities close to the sea.

Widely used throughout the United States is treatment with common salt or calcium chloride. It is a successful method but has its drawbacks. Salt tracked into a house on wet shoes may injure rugs. The salty water thrown up against the underside of an automobile aids corrosion. And there is some evidence that salt is injurious to the concrete surface of the roadway.

Among new snow-removal methods now proposed and already in use to a certain extent is melting by flame-throwers similar to those developed during the war to drive enemies out of fox-holes. One type has the flame-thruster attached to the front of a truck with a supply of liquid fuel in tanks on the motor vehicle. Whether the method is cheap enough for extensive use is not yet known.

Radiant heat is also used. In this method, pipes embedded in the paving carry steam

AGRICULTURE

Manure Faddists Make Fallacious Claims

➤ A "BOISTEROUS GROUP" of manure farming faddists is making "fallacious claims on the superiority of manure over mineral fertilizer."

This is the charge of J. S. Joffe of the New Jersey Agricultural Experiment Station, Rutgers University, made before the annual meeting of the American Association for the Advancement of Science in Philadelphia.

Mr. Joffe went over the extensive research done in the last 100 years and concluded that there is no ground for the claim that organic fertilizer is superior to inorganic fertilizer. "If anything," he said, "they are inferior."

Mr. Joffe went over six points having to do with soil structure, nutrients, moisture, microbes, residual humus and accessory elements and found the claims made by manure faddists to be exaggerated.

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or hot water from adjacent buildings. Several large stores in New York City are keeping adjacent sidewalks clear by this method. The ramps which buses climb into New York's new giant bus station are radiant heated. In Oregon a steep hill on a highway is piped with hot water from a nearby hot spring.

Among new developments is a chemical to mix with salt before it is spread on a road that prevents much of the corrosion to automobiles that occurs otherwise.

For the door steps and perhaps the front walk, is an electrically heated rubber mat which operates on the household current. It is made of a conductive rubber, a type developed to prevent icing on airplane propellers and the leading edges of aircraft wings. Its surface is grooved so that the melted snow on it runs off to the sides.

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BIOCHEMISTRY

Announce New Growth Stimulant—for Fungi

➤ **DISCOVERY** OF a new growth stimulant, called Coprogen, was announced by Drs. C. W. Hesseltine and A. R. Whitehill of Lederle Laboratories, Pearl River, N. Y., at the meeting of the American Association for the Advancement of Science in Philadelphia.

Found in the fermentation products of certain bacteria and fungi, Coprogen is the hitherto unknown factor needed for growth and reproduction of a fungus, *Pilobolus kleinii*.

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