



Bread From Snow

➤ ABOUT this time of winter, farmers all the way from the Great Plains to the upper Ohio valley are looking anxiously at their fall-sown grain fields and at the gray skies overhead. For the depth of the snow that covers winter wheat now will

have a great deal to do with the height to which the national grain-bin will be filled next summer.

Most comforting sight, to a farmer's eyes, is a field deeply covered with soft, loose snow, especially if there is reasonable prospect that it will stay that way, and even have more snow heaped on top. There is an old English weather proverb that says:

"A foot deep of rain
Will kill hay and grain,
But three feet of snow
Will make them grow moe."

A good thick blanket of snow over winter grains and other perennial and biennial plants does not "keep them safe and warm," as nursery jingles used to tell us. It will keep them safe, but not warm; obviously, if there were warmth above the melting-point of ice (which is pretty chilly) the snow would disappear.

Snow keeps the plants beneath it safe by doing two things. First and probably most important, it very greatly reduces evaporation from the dormant plants, which can go on at a really dangerous rate if they are left exposed to the dry, cold winter winds. Second, because of its loose, air-filled structure, soft snow acts as a reasonably good thermal insulator, preventing to a considerable extent the violent fluctua-

tions in temperature that occur near the surface of bare soil. This in turn abates the danger of "heaving"—the expansion and contraction of the soil as it alternately freezes and thaws that can shear the roots off exposed wheat plants and even turn them upside down and thus leave them to perish.

Glaze ice over the surface of the snow, caused by partial thawing followed by re-freezing, or by rain that freezes as it falls, is almost as bad as complete loss of the snow cover, especially if the glaze forms when the snow is thin. Over-wintering plants with exposed leaves, like all the winter grains, are not dormant in the proper sense of the term. Their leaves want at least a little oxygen, and a crust of ice prevents the minimal air circulation they need.

Finally, when the winter is ended, the accumulated snow becomes a highly beneficial source of water for renewed growth, especially if the spring thaw is gradual and lets all the moisture "stay put" in the soil and not flow away wastefully as runoff. Then the proverb's "three feet of snow" (which incidentally will not as a rule produce nearly as much water as "a foot of rain") will be right where it will do the plants' fresh start the most good, and "make them grow moe."

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ASTRONOMY

Red Supergiant Stars

➤ RED supergiant stars were once numerous in systems of billions of stars where they are now extinct. Dr. A. E. Whitford of the University of Wisconsin suggested to the meeting of the American Astronomical Society in New Haven, Conn.

Dr. Whitford used photoelectric apparatus on the 100-inch telescope atop Mount Wilson to study the light that left distant galaxies in the Corona Borealis cluster 130,000,000 years ago.

In the Corona cluster, spiral-shaped galaxies like our own Milky Way in those days had about the same color as nearby similar spirals have now, he found. But the non-spiral galaxies, called elliptical galaxies by astronomers, turned out to be redder than nearby samples of the same kind.

The nearby ellipticals are known to be nearly devoid of red giant stars. This difference, according to a suggestion by Dr. Martin Schwarzschild of Princeton University Observatory, is to be explained by the red supergiants which existed 130,000,000 years ago, but have since consumed their store of energy and ceased to shine visibly.

Astronomers have known for years that nearby red supergiants, like Antares and Betelgeuse, are spendthrift stars, and because of their relatively short life must be younger than the sun. The young stars are presumed to have condensed relatively

recently out of the gas and dust present between the stars of the Milky Way, and between the stars of other galaxies.

The non-spiral galaxies lack this raw material for new stars. Supergiants present originally would therefore not be replaced, and would gradually become extinct.

Thus, although stars change too slowly for humans to see any evolution in an individual star, the vast distances to other galaxies may be used to study the "ancient history" of the universe.

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INVENTION

Pneumatic Artificial Hand Gets Power from Armpit

➤ AN ARTIFICIAL hand with working fingers that look as natural as the purely cosmetic ones sometimes seen is offered by Frank L. Dale of New York for patent 2,457,305. Motive power for flexing the fingers is provided by a pneumatic bulb strapped in the wearer's armpit, with a tube leading to a cylinder-and-piston arrangement in the palm portion of the hand. A series of levers and lines that flex the fingers are moved in varying degrees according to the pressure applied on the bulb and the position taken by the arm to which the hand is attached.

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