



HOW THE MECHANICAL MOLE WORKS

Meaning of the letters in these cross-section diagrams is as follows: A, vertical cut made by the rolling colter; B, 8-inch sod strip lifted, but not turned over, on downhill side; C, 4-inch sod strip lifted, but not turned over, on uphill side; D, 4 inches of soil thrown under downhill sod strip.

AGRICULTURAL ENGINEERING

## Machine Builds Terraces Without Destroying Sod

A "MECHANICAL mole" that builds terraces on pasture hillsides without making dangerous breaks in the sod has been developed by engineers of the U. S. Soil Conservation Service and Iowa State College.

Earning its nickname because it does all its work underground, the new implement consists of a rolling colter to cut the sod and three different plowshares, all mounted on the same plow-beam and pulled by a 20 horsepower tractor. The four tools, acting in succession, cut the sod, lift the edge of the downhill side eight inches, shove the earth from the uphill side under it to keep it up, and drop the edge of the uphill sod to the bottom of the shallow trench thus made.

The "mole" is pulled around the hillsides on contour lines, so that the succession of hollow terraces catch and hold the rain, thereby preventing erosion and loss of lime and other essential nutrient elements. The only soil raised by the operation, along the raised edge of the

downhill side of the cut sod, is soon grown over by grass from above and below, leaving the pasture secure again in its green armor.

Terracing has been carried on successfully with the "mole" on hillsides with slopes as great as 18 per cent.

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PLANT PHYSIOLOGY

## Germination Inhibitors Hinted in Middle Ages

EXISTENCE of a substance in the flesh of fruits that inhibits the seed from sprouting too soon, only recently demonstrated by plant physiologists, was foreshadowed in the Middle Ages by the early scientist-saint, Albertus Magnus, who was a university teacher in Paris and Cologne.

Albertus wrote: "The moisture of apples, pears and similar fruits in no wise nourishes the seeds. And these, when they fall and germinate, do not gain their growth from the flesh of the fruit but from the earth. It is therefore to be concluded that the seeds germinate better if all the surrounding flesh is taken away, than if the seeds are left in it."

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ride," he told his audience, "remain in solution until more than 75 per cent. of the water has evaporated."

Tests revealed that the lake is slightly alkaline. Additional experiments revealed that water from the Great Salt Lake contains only one-sixtieth or less as much bromide salts as ordinary sea-water. Bromide salts are valuable in medicine, the manufacture of photographic films and for anti-knock motor car fuels.

## Liquid Helium in Quantity

A low-temperature plant to turn out a gallon of liquid helium per hour for use in vital scientific research was described by Prof. John G. Aston of Pennsylvania State College.

A "helium bomb" to allow a portion of some highly-compressed helium to expand, and in so doing take away heat from the remainder, liquefying that remaining portion, features the apparatus that will be placed in service shortly in the low-temperature laboratory of the Pennsylvania institution, Dr. Aston reported.

Liquid helium is one of the coldest substances known, boiling at a temperature of 452 degrees below zero Fahrenheit. Working temperatures of as low as 440 degrees below zero are obtainable by the use of liquid helium, Dr. Aston indicated.

Valuable studies of organic substances at temperatures from 440 degrees below zero up to their melting points are being carried out with equipment already in existence and using liquid air and liquid hydrogen as the cooling media. The helium plant will extend the range of temperatures.

The new helium equipment will make the Penn State laboratory one of the largest of its kind in the world. Comparable laboratories are located at the University of California at Berkeley, University of Toronto, and at Leyden, Holland, and Berlin.

Direct evidence of the existence of "zero point energy," one of the cornerstones of the scientist's picture of the way in which atoms work, was reported by Dr. Alexander Goetz of the California Institute of Technology.

A helium liquefier to chill atoms under test to 450 degrees below zero Fahrenheit linked to a spectroscope to analyze light and an X-ray machine were the tools Dr. Goetz used in his attempt to wrest from the atom further details of its life-history.