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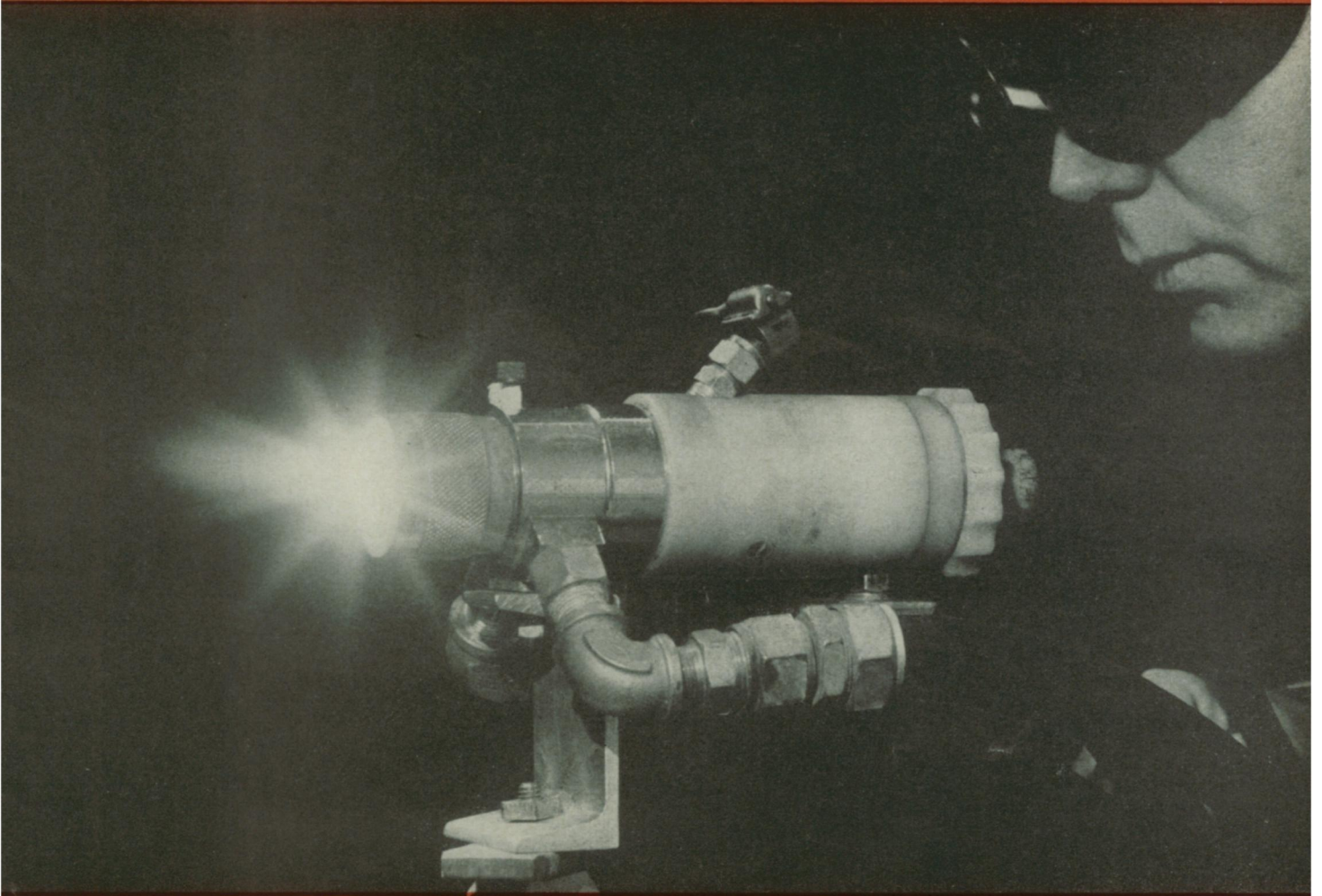
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May 14, 1960

VOL. 77, NO. 20 PAGES 305-320

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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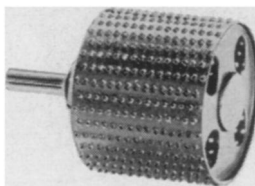
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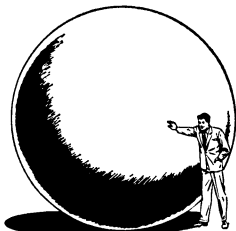
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CONSERVATION

Two Billion Trees Planted In Record-Breaking Year

MORE THAN two billion trees were planted on 2,118,471 acres of land in the U.S. during 1959, the Department of Agriculture has reported. This is a record high and is largely the result of the tremendous increase in planting on private lands, which jumped from 1,326,370 acres in 1958 to 1,884,071 acres in 1959. One-third of the land planted, the USDA reported, was cropland placed in the Conservation Reserve program under ten-year contracts. Under this program, farmers receive cost-sharing help to place in conservation uses land voluntarily retired from crop production.

Science News Letter, May 14, 1960

Do You Know

The safety of mothers at childbirth has increased drastically in the U.S. from a mortality rate of 63.6 per 1,000 live births in 1930-34 to a low of 4.5 in the four years ended in 1958.

About 28,000,000 acres of the nation's cropland will be held out of production in 1960 under Conservation Reserve contracts to help ease the farm surplus situation.

Questions

BACTERIOLOGY—How many pheasants died from botulism in New York State recently? p. 311.

ENGINEERING—How deep will the well to be drilled under Greenland's ice cap be? p. 312.

ROCKETS AND MISSILES—The Saturn rocket is expected to be tested in flight in how many years? p. 306.

Photographs: Cover, Avco Research and Advanced Development Division; p. 307, Bell Telephone Laboratories; p. 309, The Martin Company; p. 311, Fremont Davis; p. 314, Federal Civil Defense Administration; p. 320, Harshe-Rotman Inc.

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Catching Up with a Slippery Equation

What goes on when two moving surfaces are separated by a film of oil?

Simple question? Maybe, but engineers and mathematicians have been trying to answer this classic question of lubrication ever since Osborne Reynolds neatly stated the problem in equation form back in 1886.

Unfortunately, analytical methods for solving Professor Reynolds' partial differential equation worked only for unrealistic oil bearings, bearings with widths approaching zero or infinity. And approximate methods were crude, requiring a complete recalculation for each slight change in the bearing.

Recently, mathematicians at the General Motors Research Laboratories came up with the most versatile and efficient method of solution yet made. Their analytical method for solving the two-dimensional Reynolds' equation applies to all finite journal bearings — as well as other hydrodynamic bearings — with *no* assumptions or approximations about boundary locations. The new method uses a long-neglected energy theorem recorded by Sir Horace Lamb instead of the force relationship tried by Reynolds and others.

Besides being a valuable contribution to the theory of lubrication, this work has its practical side: namely, accurate, serviceable design curves for engineers. At GM Research, we believe delving into both the theoretical and applied sides of a problem is important to progress. It is a way of research that helps General Motors fulfill its pledge of "more and better things for more people."

General Motors Research Laboratories Warren, Michigan

Hydrodynamic analyses have led to specific answers about bearing operation. Shown here are the oil pressure distribution (main illustration) and load-carrying capacity for a non-rotating journal with a reciprocating load.

