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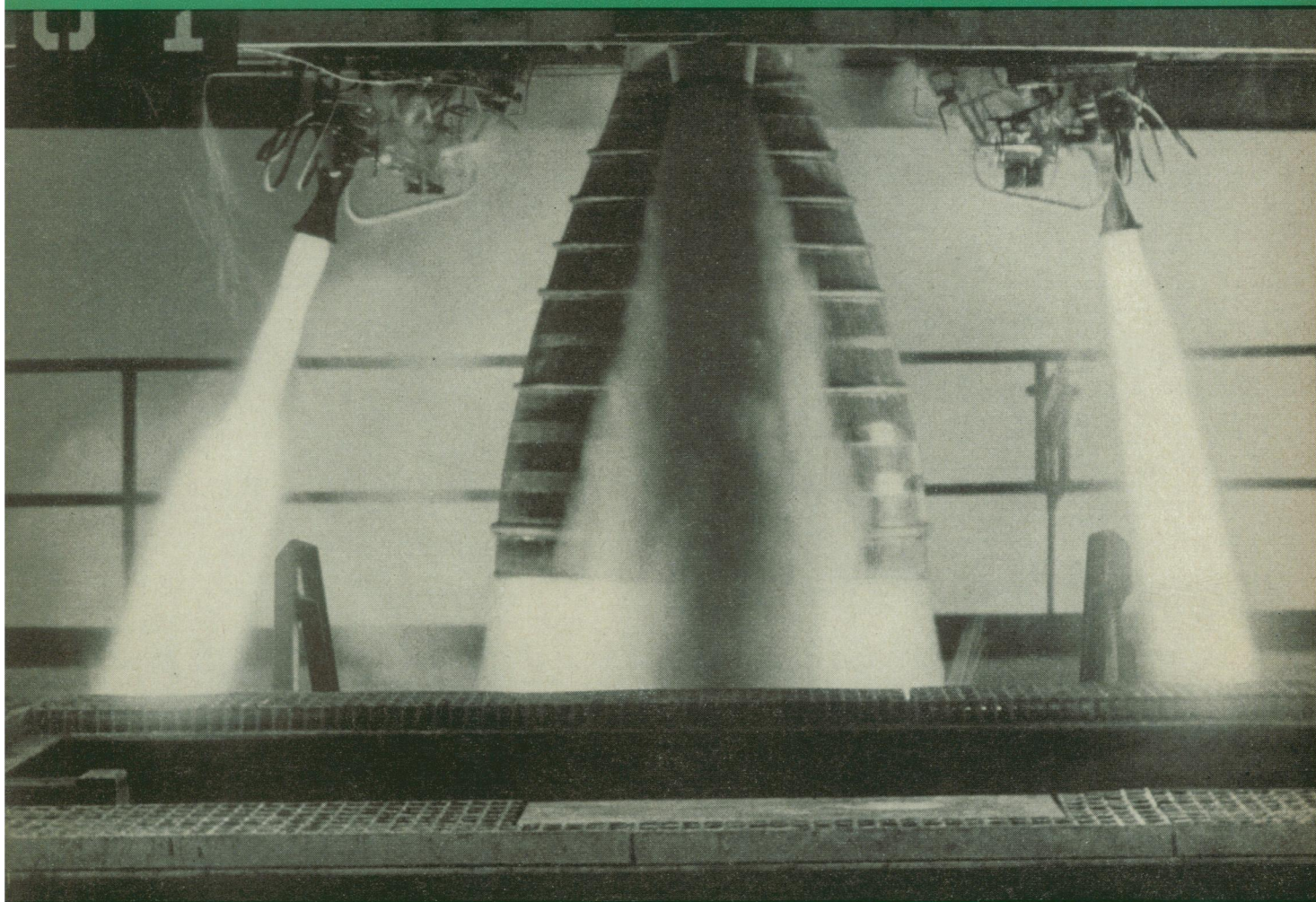
VOL. 74 NO. 18

PAGES 273-288

# SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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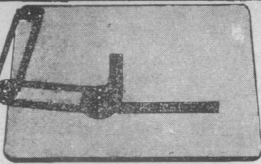
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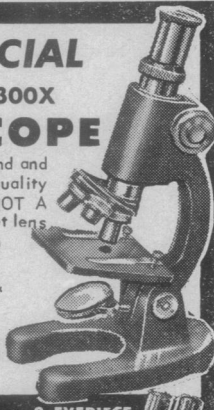
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Science News Letter, November 1, 1958

## SCIENCE NEWS LETTER

VOL. 74 NOVEMBER 1, 1958 NO. 18

Edited by WATSON DAVIS

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## New amplifier battles "noise"



Four-stage junction diode amplifier was developed at Bell Telephone Laboratories by Rudolf Engelbrecht for military applications. Operates on the "varactor" principle, utilizing the variable capacitance of diodes. With 400-mc. signal, the gain is 10 db. over the 100-mc. band.

The tremendous possibilities of semiconductor science are again illustrated by a recent development from Bell Telephone Laboratories. The development began with research which Bell Laboratories scientists were conducting for the U. S. Army Signal Corps. The objective was to reduce the "noise" in UHF and microwave receivers and thus increase their ability to pick up weak signals.

The scientists attacked the problem by conducting a thorough study of the capabilities of semiconductor junction diodes. These studies led to the conclusion that junction diodes could be made to amplify efficiently at UHF and microwave frequencies. This was something that had never been done before. The theory indicated that such an amplifier would be exceptionally free of noise.

At Bell Laboratories, development engineers proved the point by developing a new kind of amplifier in which the active elements are junction diodes. As predicted, it is extremely low in noise and efficiently amplifies over a wide band of frequencies.

The new amplifier is now being developed for U. S. Army Ordnance radar equipment. But it has numerous other possibilities. In radio astronomy, for example, it could be used to detect weaker signals from outer space. In telephony, it offers a way to increase the distance between relay stations in line-of-sight or over-the-horizon communications.



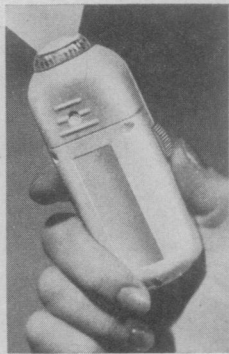
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# Questions

**ASTRONAUTICS**—How much would the projected space sailboat weigh, not including its payload? p. 277.

**BACTERIOLOGY**—What is one microorganism that is becoming resistant to penicillin? p. 278.

**MEDICINE**—In what ways is the new fluorescence screen better? p. 281.

**OPTICS**—How much magnification can the lower compound lens sector of the new eyeglass produce? p. 275.

Photographs: Cover, Rocketdyne-North American Aviation Inc.; p. 275, Dr. William Feinbloom; p. 277, Westinghouse Research Laboratories; p. 278, Museum of Science; p. 279, Ohio State University; p. 282, U. S. Forest Service; p. 288, Eastman Chemical Products, Inc.

# Do You Know?

An overdose of *somatotropin*, the growth hormone produced by the body's pituitary or "master gland," produces diabetes in animals.

A large percentage of the *meteors* that fall on the earth do not belong to the major showers and are classed as "sporadic" meteors.

*Radiological defense* instrument kits are being distributed to 6,000 senior high schools throughout the nation for use in science classes.

The sharp-toothed South American fish, the *pirhana*, literally eats other animals, including man, bit by bit, alive.

Unmated king *penguins* steal eggs from unguarded nests and brood them.

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