



**MASS-PRODUCED TRANSISTORS** — A new technique, developed at Philco Corporation, Philadelphia, allows mass production of surface-barrier diffused transistors, or SBDT. Here, engineer Richard A. Williams is preparing germanium blanks for such transistors. In the quartz tube are tiny "boats" carrying bits of germanium. Particles of metal, carried by a gas flowing through the tube as it rests in the furnace, diffuse in the surfaces of the blanks. Highly mechanized machine etching results in transistors operating in the 500-megacycle range.

## ASTRONOMY

## Sun Called a Dwarf Star

► THE SUN is a dwarf star with a surface temperature of 6,400 degrees absolute, or about 11,500 degrees Fahrenheit, twice as hot as a very bright tungsten lamp.

This value for the solar surface temperature was given in the Henry Norris Russell lecture of the American Astronomical Society meeting in Berkeley, Calif., by Dr. Joel Stebbins of the University of California's Lick Observatory, Mt. Hamilton, Calif., reporting joint work with Dr. Gerald E. Kron, also of Lick Observatory.

Some stars, Dr. Stebbins said, "are a few hundred times fainter than the sun, but many are thousands of times brighter."

Using the same scale on which the sun's temperature was measured, Drs. Stebbins and Kron have found the temperatures of the hottest stars, such as those in the constellation of Orion, to be as high as 25,000 degrees absolute.

The sun's brightness, or magnitude as it is called, is the unit in which many astronomical quantities are expressed. Although astronomers say a star is 50 times brighter than the sun, it is difficult to compare the sun's light with that of any individual star.

To the eye, Dr. Stebbins pointed out, the sun is apparently some ten billion times brighter than Sirius, the brightest star visible in the sky.

Using a new device for reducing the sun's light by a known amount without changing its quality, and with the aid of a photoelectric cell, Drs. Stebbins and Kron compared the sun quantitatively for intensity and color with a standard lamp and with the ideal blackbody source of a laboratory electric furnace.

Then the light of the lamp, shining through a pinhole on one of the Mt. Hamilton peaks, was observed through a telescope on another peak some 2,000 feet away. This artificial star was compared in brightness and color with various real stars in the sky.

Numerical results, Dr. Stebbins reported, are a magnitude of minus 26.73 for the sun's visual brightness, and .53 for its color index, both on the international scale.

The solar magnitude found by Drs. Stebbins and Kron is about 10% fainter than the standard used in recent years, but the color index agrees exactly with that of other stars having a composition similar to the sun.

The comparison with the lamp and the electric furnace was made at 3,000 degrees absolute. The new values fall within the range of previous determinations, but use of photoelectric cell improved the accuracy obtained by visual and photographic methods.

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## PUBLIC HEALTH

## Late Now for Much Horse Disease Spread

► EQUINE ENCEPHALOMYELITIS, or horse sleeping sickness as it has been called, is unlikely to spread much now among humans because of the lateness of the season, even though the disease is still hitting horses, public health authorities believe.

The disease is spread by mosquitoes, which do not linger much after cold weather sets in.

Anti-mosquito protection, including screening houses and keeping children indoors after dark in regions where the disease is occurring in horses, are measures recommended to prevent the disease in humans.

A vaccine to protect humans, similar to that for horses, could be made. However, widescale vaccination that would have to be repeated every year does not seem practical in view of the infrequent occurrence of the disease.

Cases among horses have been reported in Massachusetts, New Jersey, Delaware, Maryland, Virginia, the Carolinas, Georgia and Florida, and in Washington and Idaho. Reports of human cases are still under investigation.

In humans, the disease usually starts suddenly, especially in children, with high fever. Stiff neck and back, convulsions and coma, or unconsciousness, are symptoms.

The disease is primarily a sickness of birds with man and horses being accidental secondary victims. The virus survives from one season to the next season in ticks.

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## GENERAL SCIENCE

## Use Interlingua at Hematology Meeting

► BLOOD DISEASE SPECIALISTS from all over the world gathered in Boston for the International Meeting on Hematology and Blood Transfusion used Interlingua, the now-established common idiom of science that makes it easy for scientists to exchange information without having to learn to read and write half a dozen different languages.

The Sixth Congress of the International Society of Hematology and the Sixth Congress of the International Society of Blood Transfusion are the fourth and fifth international congresses to use Interlingua as the official second language for summaries of scientific reports and official programs.

The others using Interlingua in this way were the Second World Congress of Cardiology, Symposium on Adrenal Function in Infants and Children, First International Symposium on Venereal Diseases and the Treponematoses.

The propagation of Interlingua is one of the many service activities sponsored by SCIENCE SERVICE.

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