

felt that eucalyptus held most promise for the production of a quick-growing firewood crop on the warm, moderately dry uplands of Sao Paulo, and undertook what has turned out to be a lifetime of research on this one subject.

In the course of his work he has had to

encounter much opposition, which has frequently taken a fiercely emotional turn. However, he has at all times had the unwavering support of President Prado of the Paulista Railroad Company, and now sees his long efforts crowned with full vindication.

*Science News Letter, June 14, 1941*

## ASTRONOMY

## Million Degree Temperatures Near the Surface of Sun

Theory of Harvard Astronomer, Based on Discovery By Swedish Scientist, Indicates Present Values Wrong

TEMPERATURES of millions of degrees prevail just above the surface of the sun, instead of the 10,000 degrees that astronomers have previously measured, if the theory proposed by Dr. Donald H. Menzel, of the Harvard College Observatory, is correct.

At a Harvard conference on the sun and solar-terrestrial relationships, he said that his ideas follow from recent discovery made by Dr. Bengt Edlén, of the University of Upsala in Sweden. This explained the origin of the previously mysterious lines in the spectrum of the sun's corona, its outermost envelope.

They are actually caused, he has found, by elements such as iron, calcium and nickel, from the atoms of which a great many outermost electrons have been torn off. Of the 26 outer electrons in the iron atom, as many as 13 are removed, Dr. Edlén found. He was able to imitate the effects in the laboratory by battering atoms with powerful electric sparks.

Measurements of the surface temperature of the sun, based on the light of the ordinary colors that comes to us, have given a value of about 10,000 degrees Fahrenheit. But, Dr. Menzel said, such an extremely low value would not fit in with the new theory, conditions of excitation must be far greater than this—around several millions of degrees—in the innermost parts of the corona. In spectrum photographs which he made at recent eclipses the outer part of the corona shows lines, but that of the part nearest the sun's surface is a continuous band of color. This indicates that atoms in this region are broken up on account of the high temperatures, and do not show usual lines.

"Perhaps the sun has sprung a leak,"

he said, "and these hot gases stream out from the sun's interior through holes and pores."

It might seem, Dr. Menzel suggested, that these gases, encountering lower pressures as they emerged, would expand, and the expansion would produce a great cooling. But, he speculated, it might be that great whirlpools inside the sun expand the gases before they are ejected. In that case they would still be as hot as the interior even after they were outside. This theory, he said, is preferable to others which might be offered in explanation.

Apparently the inner corona is the birthplace of the prominences, great flame-like clouds of gas which can be seen and photographed with proper instruments. Dr. Menzel announced that his associate, Walter Roberts, who is in charge of the special Harvard Observatory at Climax, Col., for studying the sun's corona from an altitude of 11,500 feet, actually saw this happen. A flare in the corona, in which he detected the characteristic green spectrum line, condensed into a prominence, and extended down to the solar surface.

Similar formation of prominences above the sun's surface, apparently out of nothing, have been filmed in astronomical motion pictures taken at the McMath-Hulbert Observatory of the University of Michigan.

Dr. Robert R. McMath, Director of the Observatory, showed some of these to the meeting. According to Dr. Menzel, this may be due to the atoms recombining. Torn apart, they do not give ordinary light, and are not detected, but as they cool and their parts come together again, they give the familiar spectrum, and then are visible.

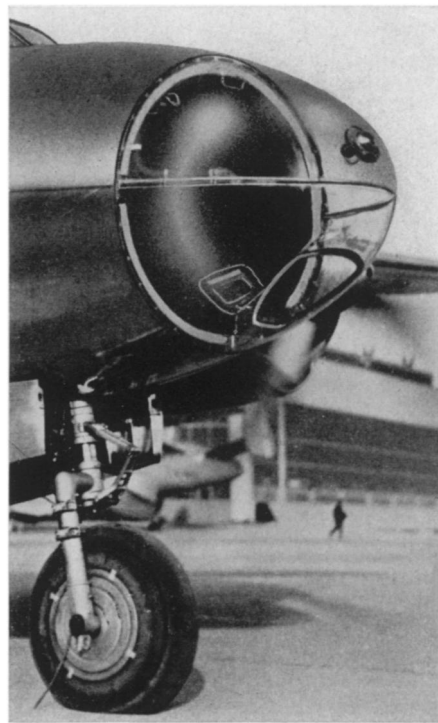
## AERONAUTICS

## Plastic Bubbles To Protect Flyers From 400-Mile Gale

WITH plastic bubbles made from such opaque materials as coal and oil, more transparent than glass as well as lighter and stronger, bombardiers and gunners on American bombing planes are protected from a gale that would tear off their clothes if they were exposed to its fury.

In the first World War, goggles supplied the necessary protection to a gunner, who could stand in his cockpit without great difficulty. But that was when 100 miles an hour was considered fast. New planes are making 400 miles per hour, and even more, so adequate enclosures are a vital necessity. To give complete visibility, and avoid blind spots in which an enemy plane might sneak in unobserved, they must be transparent.

The plastic shells, which are being made in Philadelphia for both U. S. and British planes, are formed by drawing heated sheets, then soft and pliable, over cloth-covered molds. They are clamped in position, and, when cool, they hold their shape in tropical heat or Arctic



PLASTIC NOSE

*Inside this transparent plastic nose of a Martin B-26 bomber, the bombardier, at his bomb-sight, will aim the explosive eggs as they are laid.*



FOR BOMBER

*This bubble-like dome of transparent plastic is undergoing its final polishing in the Rohm and Haas factory. Later it will form the rear gun turret of a bombing plane. Resembling an astronomical observatory dome, it is designed to permit the swinging of the machine guns in any direction. To the left is the transparent nose of a bomber, made of the same material.*

cold. They can be trimmed with a saw.

Another advantage is their lightness. Weighing 45 per cent of a corresponding glass structure, the saving, in a plane like the Martin B-26, which has

a plastic nose, rear-gun-turret, observer's dome, tail empennage and four fuselage windows, is enough to permit another bomb to "ride free."

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## PUBLIC HEALTH

## Doctors Urge Change In Liquor Sales Methods

### Propose Warning Label for Every Bottle of Liquor Advising Moderation and Accompanying Vitamins

**T**HE sale of alcoholic beverages should be made to conform to the federal Food, Drug and Cosmetic Act, by putting a warning label on every bottle, Dr. Leo Alexander, Dr. Merrill Moore and Dr. Abraham Myerson, of Washingtonian Hospital, Boston, declared before the American Medical Association meeting in Cleveland.

The medical profession, realizing fully that "alcoholism is the greatest single public health problem related to any drug," and already strongly supporting the federal Food and Drug Adminis-

tration "in its general operations and in its special task of protecting public health from intoxication and mental derangement following or associated with the use of any drug" should "firmly and uncompromisingly act" on this problem, the Boston doctors urged.

They stress that they are not prohibitionists and regard prohibition as a failure and obstructive to the real goal of temperance.

Alcohol is both a food and a drug under the definitions of the present Food, Drug and Cosmetic Act, the Boston doc-

tors pointed out, citing legal opinion.

"If the Federal Food, Drug and Cosmetic Act is designed to prevent, and to protect the American public and its health from the menace of drug intoxication and addiction, then it should apply to alcohol as its first drug of choice instead of neglecting and ignoring it altogether," they declare, adding "If one placed in a heap all the wreckage of human lives produced by the habit-formation implied in morphinism, cocaineism, barbiturate addiction, and all the narcotic and hypnotic drugs put together, and if one were to balance against them all the habit-formation of disastrous type subsumed under the term alcoholism, the scale would shift immediately and unmistakably towards alcoholism."

They urge that the Food and Drug Administration require alcoholic beverages to carry a warning label just as this type of label is required by law for other dangerous and habit-forming drugs. They propose the following label:

"Directions For Use: Use moderately and not on successive days. Eat well while drinking and, if necessary, supplement food by vitamin tablets while drinking. WARNING: May be habit-forming; not for use by children. If this beverage is indulged in immoderately it may cause intoxication (drunkenness), later neuralgia and paralysis (neuritis) and serious mental derangement, such as delirium tremens and other curable and incurable mental diseases, as well as kidney and liver damage."

"A sensible warning label will probably exert a wholesome influence upon the attitude of the community," the physician said. "At present only those who want to be enlightened can be reached by any educational program, and we can think of no better vehicle for carrying education to those who need it most than the label of the liquor bottle itself.

"There are many people who are afraid to take two aspirins at once for a cold, because of its possible effect on the heart. However, these people do not hesitate at all to take six high-balls in a row.

"We think this paradoxical discrepancy in public opinion and knowledge should be corrected."

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According to the 1940 Census the United States has over 5,000,000 people who have passed three score years and ten.

*Iraq's oil field is sometimes described as the largest single oil field in the world.*