

AERONAUTICS-PHYSICS

# Trailing Airspeed Bomb

Measures air pressure at speeds in excess of 300 miles an hour and eliminates one of the foremost dangers of testing planes.

► A NEW airspeed bomb that measures the air pressure at speeds in excess of 300 miles an hour eliminates one of the foremost dangers of testing planes. The new bomb makes it unnecessary to fly at extremely low altitudes over a speed course on the ground in order to check the accuracy of the airspeed instruments.

The bomb was developed by V. J. Schack, William Ehlers, and W. C. Drowne, of the Research Engineering Division of the Consolidated Vultee Aircraft Corporation. Similar devices have been experimented with from time to time. However, most of the previously designed bombs indicated airspeeds of 130 miles an hour or less.

The bomb itself looks like a metal lure used by fishermen. It is 12 inches long, with four rounded stabilizing fins about 3 inches long, and it weighs only 25 pounds. The static pressure head is attached to one end, the fins to the other. Despite its light weight, the bomb shows no tendency to whip or oscillate at high speeds.

The entire assembly has been designed so as to present minimum resistance to a smooth flow of air.

The body of the bomb is made of lead to provide maximum weight in a minimum area. The nose of the bomb is a standard static pressure head. This pressure head, or airspeed indicator, is really a sensitive pressure gauge. It shows the speed at which the plane is moving through the air, and is used by engineers testing the instruments of a new plane to determine whether the built-in pitot-static tube is operating properly.

The pitot tube must be extremely accurate, since every airplane has a certain safe flying range of speed. At the low point on this range, the plane approaches the stalling point. At the high extremity, it approaches a dangerously steep dive. The airspeed for a given engine speed is therefore an index of the fore and aft angle of the plane.

Since it is impossible to obtain true static pressure indications in the turbulent air close to a plane in flight, the new bomb is attached to a cable and lowered by means of a winch to a suitable distance from the plane. Either side hatches or belly hatches of the modern bomber can be used to launch the instrument.

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file information in reconstructing measured drawings or models of ships or planes.

The absence of shadows may indicate fake planes painted on a runway or parking strip, when observed through a stereo viewer.

A knowledge of shadows is important, says the Navy, in camouflage work. Objects in the shadow of other objects are likely to be overlooked by enemy aircraft. The confusing shadow of a clump of palm trees or a hedge is often used to hide important materiel from the eyes of the enemy.

The "shadowgraph," latest training aid for Naval Airmen provides perfect silhouettes of planes and ships for recognition training. Operated on the principle of a Japanese shadow play, the equipment consists of a translucent screen, a light projector and a mirror.

The projector is positioned so that rays strike the mirror and are reflected horizontally to the screen, producing a perfect silhouette of any object placed between the screen and the mirror.

The shadowgraph can be used without darkening the room.

The instructor, standing behind the screen, manipulates the models of planes and ships, pointing out recognition features or calling for identification.

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Swedish private homes are caring for 45,000 children from Finland.

PHYSICS

# Identification Aid

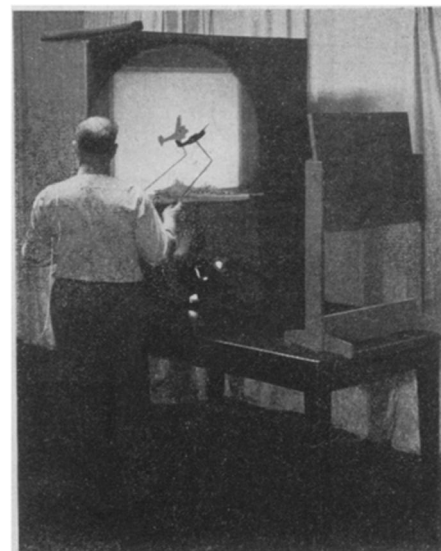
► SHADOWS throw light on identification from the air of many man-made structures, photo interpreters of the U. S. Navy report. Tall, slender objects, such as smoke stacks, water towers, storage tanks, radio and radar antennae frequently would be indistinguishable but for their shadows, say the men who study Navy photo-reconnaissance pictures for information that is of value in planning bombing raids against the Axis.

Shadow lengths give a measure of relative height. Actual height of a building, or a tower, or a boat, can be determined by comparison with the shadow cast by an object whose height is known. However, it is necessary to have the shadows to be compared made under identical conditions. Usually two shadows

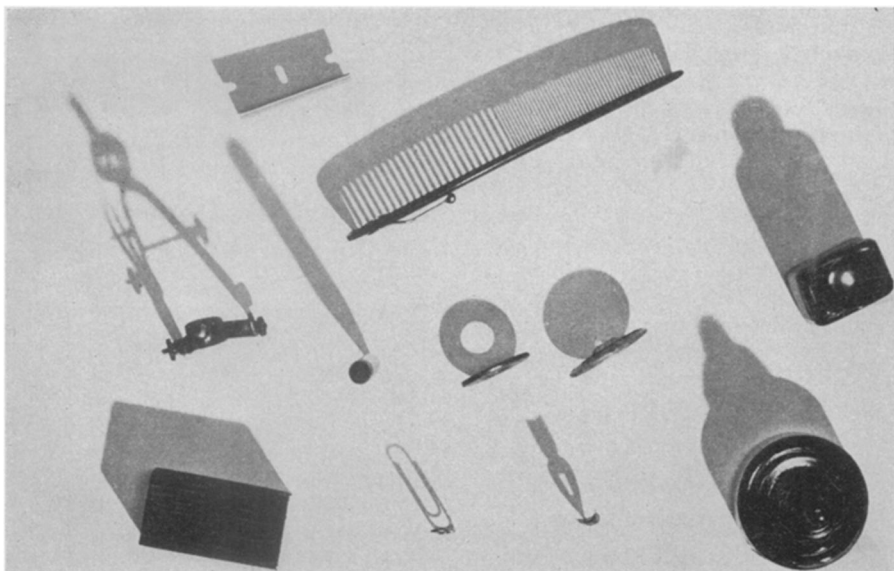
in the same picture are used for comparison when the height of the object making one shadow is known or can be determined.

Seen from an airplane, in full sunshine, a natural shadow is almost always the blackest thing on earth. Dummy or faked shadows, made by painting a shadow on the ground to deceive Allied airmen, will look lighter in photographs.

These dummy shadows can also be picked out in photos because they do not change with the sun, and appear the same in all pictures, regardless of the time of day the photographs were taken. A shadow may be a clue to some strategic enemy radio station; or it may be a deciding factor in identifying a ship or a plane. It may provide valuable pro-



**PERFECT SILHOUETTE** — The clear shadow given by the Shadowgraph, is an aid in training Navy men to identify aircraft. Light from the projector is reflected horizontally from the mirror to the screen.



**SHADOW PUZZLE**—Place a piece of paper over the shadow of each of the objects shown in the above picture and see how many you could identify without the aid of the shadow. Shadows, Navy men are taught, are important in penetrating camouflage.

#### MEDICINE

## Blots Test Alcoholics

By revealing their inner feelings and attitudes, test enables physicians to plan treatment more effectively. Six groups may be distinguished by the test.

► WHETHER or not he sees pink elephants, the things an alcoholic sees in a set of ink blots can be a big help to the doctor treating him, it appears from studies reported by Miss Victoria Cranford, of the Harlem Lodge Sanatorium staff at Catonsville, Md., to the Institute on Alcoholism, meeting in Baltimore.

The Institute is not for patients but for educating persons who have to deal with alcoholics, from doctors to clergy and probation officers, on the medical aspects of alcoholism.

The ink blot tests, designed by a Swiss psychiatrist, Hermann Rorschach, for whom they are named, reveal the inner feelings and attitudes of the alcoholic, feelings he may not know he had, but which make up the real reason why he cannot control his drinking and becomes an alcoholic. The test was originally devised for diagnosing personality disorders such as result in mental disease. Alcoholism is also the result of a personality disorder.

In general, six groups of alcoholics may be distinguished by the Rorschach

test, Miss Cranford said. These six are the psychotic, the neurotic, the feeble-minded, the constitutionally inadequate, those who drink to deaden physical or mental pain, and those who "developed from social into abnormal anti-social drinkers as a result of habit, plus time, plus body changes and the strains of life."

Treatment, she said, has to be planned according to why the patient drinks as well as according to financial and family circumstances.

Hardest of all alcoholics to treat successfully is the business-man executive type. As a group, this kind of alcoholic is "nearly hopeless," Miss Cranford said.

"As a person," she finds, "he invariably has the little dictator attitude, characteristic of the nursery darling, and his button-punching, telephone-banging, take-a-letter-Miss-Simpson habits make him especially inaccessible to plain folks and practical living."

In spite of his bluster and brag, he feels deeply insecure and develops a drinking problem as a continued "pad-

ding" and "bolstering" of his own unadmitted feelings of inadequacy and lack of confidence. The Rorschach test is especially valuable for this type of alcoholic, because it enables the doctor to get to the patient's vulnerable points rapidly so that at least a beginning of appropriate treatment can be made before the patient gets impatient and dismisses the doctor.

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#### ELECTRONICS

## Airport Vision Will Be Better After War

► INDICATION that after the war regular airline operations will not be interrupted by fog, rain, snow or other weather conditions which contribute to poor visibility was presented by Maj. Wilbur T. Harding, Assistant Chief of the Electrical Branch, Air Corps Equipment Laboratory, Wright Field, at the meeting of the Illuminating Engineering Society in Chicago.

A preview of the well-dressed airport of the future was given in Army-Navy tests at a Naval Air Station in Newfoundland, where conditions of poor visibility prevail, Maj. Harding reported.

Brilliant, high-powered "approach lights" were set up along the runways of the Newfoundland airport. Until now, these lights have been used only to mark the end of the landing strip. At great personal risk, Maj. Harding stated, Army and Navy flyers conducted tests using the new lights, making landings with extremely low ceilings and with the fog "boiling" out of the ground obscuring the runway.

Flying into the airport under these low visibility conditions, using radio aids for the approach, pilots found that the approach lights gave definite aid and allowed last-minute correction necessary for safe landings. Without the lighting aid, safe landings would have been impossible, Maj. Harding reported.

Radio approach and lighting systems in use today cannot always be depended upon to lead a plane onto a narrow runway for a safe landing. Maj. Harding called for the improvement of radio and lighting systems that will allow safe landings to be made at any airport, under any weather conditions, day or night. The two aids will be correlated, he said.

"After the war, commercial aviation will flourish as never before. The public will demand regularity of operations. Safety of operations will be demanded and must be furnished along with regularity," Maj. Harding pointed out.

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