

with which allergic individuals will become sensitized to the content of pollen grains may depend to a great extent upon the small size of the allergenic molecules which have now been isolated

and studied quantitatively by electrophoresis, by ultracentrifugation, and by diffusion experiments for the first time," Dr. Abramson declared.

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PHYSICS—AERONAUTICS

Three Inches of Safety Glass Shields Fliers from Bullets

Blow of Bullet Shatters and Even Powders Glass Around Point of Impact But It Is Unable to Penetrate

BULLET-PROOF safety glass three inches thick, used as protection for fliers in war planes, stops even the heavy bullets of .50 caliber machine guns, hitting it squarely at right angles at a range of only 100 yards, states Horace J. Alter, aeronautical engineer. (*Army Ordnance, March-April*). Bullets of the regular rifle-caliber machine guns are stopped by two inches of the same kind of glass.

The blow of a bullet shatters and even powders the glass around the point of impact, but the missile dissipates its energy in friction and is unable to penetrate, Mr. Alter reports. Since airplane windshields are always streamlined, and hence present a sloping surface to an attacker's fire, less than the thicknesses named will practically always suffice for protection.

Steel plates, used beneath and back of the flier, to protect him against ground fire and from fighting planes that "get on his tail," may have to go up to half-inch thickness as heavier-caliber machine guns are mounted on fighters. Plates of this thickness will turn .50-caliber bullets at all angles greater than 20 degrees departure from right-angle impact.

Necessity for armoring planes will probably force crews and vital equipment into ever more compact arrangement, since every square foot that has to be protected adds pounds of dead weight to the plane's load.

Utilization of other structures for incidental protective function is urged by Mr. Alter. Wheels in the retracted position can be so arranged as to cover part of the fuel tanks, preventing bullets and shell-splinters from puncturing their bottoms. Surfaces of internal bracing members can be sloped to deflect bullets and cause them to tumble, thus robbing them of power to penetrate.

Need for armor protection began to be realized by fliers during the first

World War, as soon as they found themselves under fire. They improvised as well as they could, putting stove-lids under their seat cushions, and fastening pieces of steel shields from disabled field guns on the backs of their seats. After the war, designers of military planes tended to dodge the question of armor because they hated to add weight. But now, under the lash of deadly necessity, they are again working armor protection into their plans.

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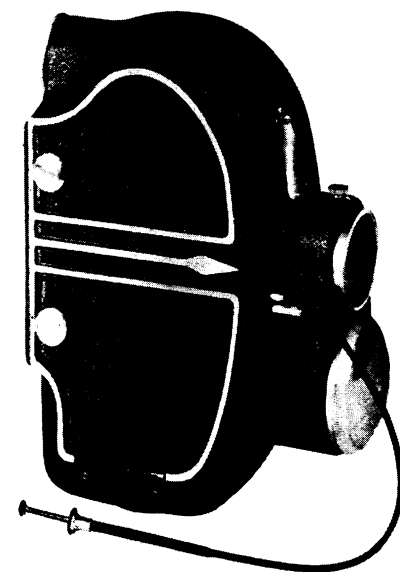
MEDICINE

First-Aid Information Against War Gases

AMERICANS are still fortunately not in immediate danger from war gases but many of them, remembering first-hand experiences with this chemical warfare weapon in World War I, have been wondering why so little has been heard about anti-gas measures in our plans for total defense. As if in answer, there comes the first American edition of the *British Medical Manual of Chemical Warfare*. (Reviewed, SNL, this issue.)

The book is intended primarily for medical officers of the Army and Navy and the air branches of these services. It is, therefore, rather too technical for general lay reading, although thorough-going first-aiders may find it worth studying. As is emphasized in the foreword, "speedy recognition of the type of gas which has caused casualties is essential for rapid diagnosis and efficient treatment; these desiderata can only be obtained by timely and thorough knowledge of chemical warfare substances, their characteristics and their effects on the human body."

According to this manual, the old war gases, such as chlorine and phosgene are not likely to be used. Mustard gas, being



FOR PHYSICIANS

With this camera, and its battery of attachments, physicians and surgeons may make color or black-and-white photographs of their cases. A flash bulb is located below the lens, and is operated in synchronism with the exposure. If desired, the bulb may be fired in a separate reflector, several feet away. A tubular attachment may be used to take photographs in the mouth, for example, the light being reflected to the point desired. (Cameron Surgical Specialty Co.)

more versatile and more subject to novelty in its use, may be employed, it is believed. It may be sprayed from aircraft directly on troops, or mustard gas air bombs, along with high explosive or incendiary bombs, may be dropped on buildings, encampments and industrial centers.

One of the gravest dangers of liquid mustard gas is that of damage to the eyes. The immediate discomfort may be slight and brief, but within an hour or so the eye will be inflamed and the lids swollen and painful. Ulceration of the cornea and loss of vision may result if proper treatment is not given. Special eye shields or suitable gas masks will protect the eyes. If these are not worn, immediate preventive treatment should be used even if only a very small drop of mustard gas liquid gets into an eye. Recommended preventive treatment is thorough immediate washing of the eyeball and the insides of the lids with plain water from a water bottle. An eye cup, syringe or dropper will help in this process. The washing-out should be thorough and repeated hourly.

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