

AVIATION

# Modern High-Speed Bombers Show Very Bad Marksmanship

## Cause for Encouragement to Peaceful Peoples, Declares Military Student; Mud Still a Great Defensive Weapon

**P**OOR marksmanship by aerial bombers in the Spanish war "has given cause for more encouragement than discouragement to peaceful peoples," declares Capt. Liddell Hart, well-known student of military science. (*Army Ordnance*, Jan.-Feb.)

The very increase in speed that marks modern bombing planes is an important factor in their inability to hit the traditional "flock o' barns."

"Higher speed in the air has offset the improvement of bomb sights and diminished the accuracy of bombing, owing to the fact that the bomb has to be released before the aircraft is over its target," writes Capt. Hart. "As a result, it was found that targets less than 500 yards long and 150 yards broad rarely were hit.

"Attempts to destroy bridges or to put individual batteries out of action failed even when the attacking machines came down to heights of less than a thousand feet, while attacks on fortified positions only have taken effect where these were clearly defined and the bombing formations could operate undisturbed.

"It has been against large targets, such as towns, that the results have been most marked, although even in such cases the actual point hit within the area has been largely a matter of chance. Night bombing has proved more inac-

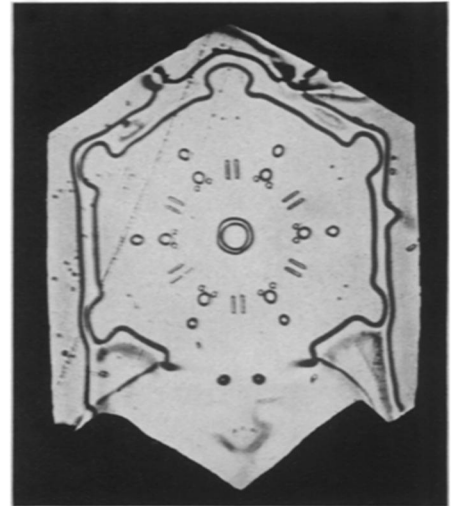
curate."

The real effectiveness of airplane attack, Capt. Hart feels, has been moral rather than material. When troops without adequate anti-aircraft defenses find themselves under consistent and heavy attack from the air, and especially when they see other airplanes going off to attack their home towns in the rear, they are apt to become disheartened and to offer poor resistance against infantry or tank assaults following up the enemy bombing.

The high speed of bombers and other aircraft has been their undoing in another way, under the hurly-burly of field conditions, Capt. Hart points out. The small size and rough surface of the average improvised landing field has proved fatal to planes with high landing speeds, producing many crashes.

And for all the improvements in tanks, and all the advances in other machines of war, one of the greatest enemies of the attack and friends of the defense, is old conservative General Mud. Whether infantrymen are wearily slogging forward on foot, or tanks are rattling ahead on their tractor treads, if they strike boggy going they might as well quit. If they stubbornly push on, presently they find themselves glued like flies on flypaper, immobilized into mere targets.

*Science News Letter, January 29, 1938*



**DESIGN FOR A CLOCK FACE**

*This pattern, that looks as though it might be an artist's sketch for a new, ultra-modern electric clock, actually is a photograph of a snow crystal, made by the late W. A. Bentley. One side, apparently damaged in some way, rebuilt itself, restoring the hexagonal symmetry but not the original pattern.*

MILITARY SCIENCE

## Nations Pile up Stocks Of Civilian Gas Masks

**E**UROPEAN nations are piling up stocks of gas masks for civilians and spending huge sums in the construction of gasproof shelters, reports Lt.-Col. Augustin M. Prentiss of the U. S. Army chemical warfare service.

England is engaged in manufacturing 30,000,000 gas masks, in an effort to provide protection for every person in the kingdom. France already has accumulated 8,000,000 for its active civilians, Germany has on hand 7,500,000, and Italy 5,000,000 for the same purpose.

Cost of gas shelters ranges from \$150 for a single room to \$100,000 for large communal shelters capable of accommodating several thousand persons. In France, plans have been drawn for the construction of fifty large gas shelters in the subways, at an estimated cost of \$5,000,000. Germany believes in a decentralized gas defense system, and it is claimed that more than half a million such small shelters have already been built. Similar construction is also under way in Japan.

According to Lt.-Col. Prentiss, civilians are classified into "active" and "passive" groups. The former, about ten per cent. of the total population, comprise policemen, firemen, decontamination squads, and others who must stay out even in

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