

AVIATION

# Single-Seat Pursuit Plane Gives Way to Bigger Fighters

## Greater Hitting Power Demanded of Craft to Combat New "Flying Fortresses"; To Carry Rapid-Fire Cannon

THE SINGLE-seat pursuit plane, romantic subject of tremendous tales of derring-do in World War days and later, has been doomed by the coming of giant multi-engined bombers such as Uncle Sam's "flying fortresses," Horace J. Alter, New York aeronautical engineer, declares. (*Army Ordnance*, Sept.-Oct.)

In its place, Mr. Alter predicts, is coming the multiplace fighting craft with a crew of seven men or more. That is the only type of plane, he indicates, powerful enough to knock down today's huge bombing planes and the bigger ones still to come.

Only such a plane, fitted with more than one high-performance engine and armed to the teeth with heavy guns that can deal out real punishment, is a match for the "flying fortress." Single-seat or two-place planes, with their necessarily limited armament, cannot do enough damage to today's all-metal, heavily built bombers to bring them down, he asserts. It takes highly concentrated fire of heavy bullets for a relatively long period of time, rather than a single chance shot, to knock out of the sky a plane such as the "flying fortress."

### Radial System's Limit

The end of the era of dominance of the great radial air-cooled engines, which have reached their highest development in the United States, is also foreseen by Mr. Alter. "As the diameter of the radial engine increases, more of the horsepower is used in overcoming the resistance of the engine itself, until a point is reached at which no matter how many engines are added, no increase of speed is obtainable."

Liquid-cooled in-line engines, with small cross-section area and therefore small aerodynamic resistance, or Diesel engines of compact design, will take their place, he predicts.

Detailing specifications for the multiplace fighter he envisions, Mr. Alter asserts that it will most likely have at least seven men in its crew, so that its fighting mission can be carried out even if some of its men are disabled. It will

have a supercharged cabin divided into air-tight compartments to enable high altitude fighting and to minimize the effects on its crew of damage done to one portion of the plane.

Powerful fore-and-aft fire from rapid-fire cannon will feature its armament. It will have sufficient range so as to be able to cruise around for several hours on the lookout for hostile craft and still have enough gasoline left to give any such plane it encounters a solid argument.

Although Mr. Alter does not so state specifically, the U. S. Army Air Corps has already taken a long step toward realization of such a design. The Bell XFM-1 Fighter, known better as the "Airacuda," is a heavily-armed fighting craft fitted with two 1,000-horsepower Allison liquid-cooled in-line engines and carries a crew of five. Its fighting ceiling is well over 20,000 feet. Army airmen admit that the "Airacuda" is the plane

designed to bring down the "flying fortresses." Thirteen of this radically new type of ship are being built to Army order. An experimental unit of this plane has been in Army possession for more than a year.

*Science News Letter, September 10, 1938*

BIOLOGY

## Goldfish Survive Brief Immersion in Liquid Air

TO SETTLE the long-disputed question, whether fish frozen in liquid air can "come to" again, Dr. Basile Luyet, of St. Louis University, has carried out a series of carefully controlled experiments, in which goldfish were immersed in the super-cold fluid for periods of from 10 to 60 seconds and then placed in water at ordinary room temperature.

Dr. Luyet sums up his results in three sentences:

"A goldfish completely frozen in liquid air is dead.

"A fish with its body walls partially frozen dies or survives according to the degree of damage to the tissues.

"A fish that has been frozen only superficially may become momentarily rigid but will regain its activity when it is re-warmed."

*Science News Letter, September 10, 1938*



### BATTLE-CRUISER WITH WINGS

*Fast, far-ranging, heavily armed, multi-gunned fighters of the "Airacuda" type are expected to replace the daring single-seater pursuit planes of war-time fame, now deemed too light to attack the enormous new heavy bombers now appearing in the world's air fleets.*