

# Hinged Wing Marks Contest Airplane

Aviation

By CAPT. THOMAS CARROLL

The Cunningham-Hall airplane entered in the Guggenheim Safe Aircraft Competition is an ingenious craft.

The little airplane is designed around the very unusual Hall wing. This wing is one in which the normal contours are maintained when in normal flight, but for slow speed operation by means of a manual control the rearward half of the wing is hinged and turned down to a large angle of attack. This gives a condition of increased camber, but in addition to that a long opening on the underside of the front part of the wing is uncovered, which permits air to flow through the inner part of the wing, and is discharged across this downward flap to the rear. It has then the doubly ef-

fective advantage of both increased camber and boundary layer control, which insures a maintenance of high lift in the slow and high angle of attack condition.

Complete test information on the airplane is not yet available, due to the fact that it was finished in the Rochester factory only a day or two before the close of the acceptance of entries in the competition. It was necessary to curtail the brief period of factory flight tests, and to dispatch the airplane cross country to Mitchel Field. Unfortunately, while on this cross-country trip, the engine, which incidentally was not of American manufacture, broke a crankshaft and blew off its propeller. The pilot even in that difficult position and finding himself with only small fields available, was able to make a landing in a very

restricted area entirely without further damage to his airplane. With the closing of the competition less than 24 hours off, the airplane had to be disassembled and brought to Mitchel Field by motor truck, where it is now reassembled and having a new engine fitted for its tests.

It is a biplane, or probably more correctly, an inverted sesqui-plane, in which the Hall wing as described above forms the lower wing, and it is not equipped with ailerons or lateral control devices. The upper wing, which is of very much less span and of extremely small chord, is almost entirely aileron.

The performance of the Cunningham-Hall will be watched with considerable interest, and it may prove to be a very serious contender.

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## Helium Heart's Affinity

Physics

A story of chase and capture in the submicroscopic world of physics was related by Prof. Bergen Davis of Columbia to the National Academy of Sciences.

Electrons excited and speeded by an electric field were made, in experiments performed by Prof. Davis and his associate, A. H. Barnes, to pursue the hearts of helium atoms, known as alpha particles shot out by radioactivity at a velocity of 9,000 miles per second. The objective was to make a helium nucleus seize and hold one or two of the electrons chasing along near it.

Only when the electron was in just the right condition of velocity, was it captured and the velocities of capture corresponded to the energy levels of the electron satellites of the atom as pictured by physicists.

In one of the experiments the speedy electron and receptive helium nucleus were placed close together for so short a time that the electron could not have had time to fall by gravitational attraction like a meteorite pulled to earth by the force of gravity. Yet the electron was captured and this caused the experimenters to wonder if the alpha particle or the electron or both might fluctuate in size, becoming very large when they are about to unite and becoming exceedingly small at other times. The auras or spheres of influence would in this event change with the energy of the particles.

This new light on the behavior of

the nucleus of the helium atom in making electrons its own is considered a step toward better understanding of the constitution of this important building block element. Helium, useful as a gas for airships, is interesting to chemists because it is made of four hydrogen atoms and is itself the fundamental stuff for other atom building.

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## Child Habit Clinics

Psychiatry

The United States has 350 cities in 36 of its states where there is at least one habit clinic to which problem children may go to have their troubles understood and adjusted, the U. S. Children's Bureau has found as a result of a check-up on the increase in these child-guidance institutions. The Bureau has just issued a pamphlet directory listing the 500 psychiatric clinics for children in this country, thus showing the available resources in any given locality.

It is only 20 years ago that the first clinic for the study of delinquent children was set up in connection with the Chicago juvenile court, Miss Grace Abbott, chief of the bureau, stated in comment. The number today is still insufficient to meet more than a small fraction of the needs of delinquent children and the needs of the children who are serious failures at school or suffer from timidity and other personal handicaps.

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## Diet Aids Breeding

Zoology

Sables and martens, whose pelts are among the most highly valued of all furs, have been bred successfully in captivity at the Moscow Zoological Park. The present experiments have succeeded where others failed because the animals were given as near an approximation as possible to the rich and varied diet they get for themselves in the free forests, rather than the limited and more or less unnatural rations customary in zoos.

Under natural conditions these small carnivores feed largely on birds and small animals, making a special tidbit of bird brains. The lecithin, which brains contain, seems to be essential in reproduction, and the ordinary zoo diet is poor in lecithin. The ration in the Moscow experiments consisted of hens' eggs, calf brains and liver, to which common sparrows were added.

On this rich food the sables and martens mated and produced good litters. During pregnancy the females required an especially high lecithin ration, getting as many as four sparrows and nearly an ounce of brains a day.

Some new facts about the life history of these animals were learned from the breeding experiments. The period of gestation is much longer than was originally supposed, being nine or ten months in the case of sables and a little over seven and one-half months with martens. Sables mate in June or July instead of in January, as formerly supposed, and the mating of martens occurs in July.

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