

Fighting Bugs With Aircraft

Experiments Show Poison Can
Be Distributed With Re-
markable Precision.

Washington, D. C.—Announcement that the U. S. Army air service will use a motorized balloon to make a chemical attack upon the gipsy moth in New Hampshire recalls the interesting pioneer experiments in fighting insects with aircraft.

C. R. Neillie and J. S. Houser, in a communication to the National Geographic society, related their practical test of distributing insecticides from aloft as follows:

"In these very modern times one should be prepared to expect the unusual, but to be told upon inquiry for a man at his office that 'He is up in the air; I don't know when he will come down' is so ultra modern that the average person would be taken somewhat aback.

"Such, however, was the experience of the writers one summer day during the course of the work herewith reported. And after a short time, the one for whom inquiry was made did safely 'come down.' This was Lieutenant J. A. Macready, acting chief of the flying section of the government's aviation experimental station at McCook field, Dayton, Ohio—the man who piloted the machine which was an epoch maker in the annals of insect warfare.

"Two years ago there occurred in Ohio three full broods or crops of the caterpillars, each sufficiently numerous to defoliate completely the grove in which they appeared. Some groves put out three full crops of foliage and each in its turn was wholly consumed by the ravenous worms.

"Our work was directed against the second brood of caterpillars working on the second crop of foliage.

Method of Attack.

"The plane used was a Curtiss JN-6 equipped with a hopper for carrying and liberating the poison powder. This hopper was secured to the fuselage of the plane by the side of the observer's seat. It consisted of an irregularly shaped flat metal box with a capacity for holding a little more than 100 pounds of dry arsenate of lead powder.

"At the bottom was arranged a sliding gate, operated by a handle accessible to the observer in the plane. At the top of the hopper was a crank, connected by a sprocket chain to a revolving mechanism in the bottom, which when placed in motion dropped the poison powder through the previously opened sliding gate.

"Immediately upon leaving the hopper the dust dropped into the 'slip stream'—the violent air current set up by the revolving propeller—and was thrown into violent agitation in a dense white cloud which trailed out behind the moving plane as if the machine were on fire and belching large volumes of white smoke.

"The catapa grove in which the dusting was done was situated on level ground and had been planted for the growing of post and pole timber. It was a rectangular plot 800 feet long and 325 feet wide and contained approximately six acres. The trees, 4,815 in number, were from 25 to 30 feet tall.

"The plane flew at a speed of eighty miles an hour at an altitude of from 20 to 35 feet and in a line 53 yards to the windward and parallel to the grove. The dense cloud of poison dust thrown out behind the moving plane was grasped by the wind and floated through and over the grove, covering the foliage in its passage.

"We feared that the dust might all settle on the trees in the immediate foreground, but to our surprise we observed that little currents of air which we termed 'booster currents' were rising in the grove and these had a tendency to toss the settling dust cloud

upward, whereupon it would be grasped by the wind blowing parallel to the earth's surface and thus carried onward, even to and beyond the far side of the grove.

Poison Well Distributed.

"Not a tree could be found, and many were climbed and examined, whose leaves did not bear particles of the deadly poison, easily detected by the unaided eye.

"In all, the dusting plane passed the grove six times and distributed about 175 pounds of the poison. Since each passage required but nine seconds, the total time consumed in the actual work of dusting was 54 seconds, thus establishing a world's record for speed in applying insecticides to forest areas.

"The outstanding feature of the application was the remarkable precision with which the poison could be placed at the point intended, thus dispelling the idea expressed by many before the test was made that the poison dust would be tossed willy-nilly by the air currents—wholly beyond control."

Paris to Cut Red Tape in Shopping System

Paris.—American women who have shopped in Parisian stores and gone through the nerve-racking waits involved in the slow French system of paying will be glad to know that improvements are in progress.

The leading stores are now reorganizing the sales and wrapping systems; each department will have an electric cash register, and the girls will do their own wrapping. The improvements thus begun will do away with the tedious waits of purchasers and their rushes to get through the crowds to the cashiers' desks.

Collect Songs of Great War

Bulky Volume Reposes in the Li-
brary of Congress at
Washington.

Washington, D. C.—Do you remember:

"How you gonna keep 'em down
on the farm
'After they've seen Parree?"

The library of congress in Washington has just completed a bulky collection of songs of the World war. But the overseers veteran who in later years consults it for some of the old-time favorites which he sang on the march in his doughboy days, will search its pages in vain. These songs are conspicuously missing.

The answer is simple.

The censors who compiled the book were unanimous in the opinion that the songs the soldier himself composed and sang spontaneously on his marches would not bear the light of public print. Except as they linger in the memories of their composers and chanters, these old songs are doomed to die.

Mostly Home Songs.

Consequently the book is largely a collection of music hall successes, sung on this side of the water to keep up the morale of the folks at home, or thrown on the screen at Red Cross huts and "Y" canteens for the enlightenment of the A. E. F. The unexpurgated versions of these songs which the boys revamped and sang to keep up their spirits as they marched into death and destruction will never see the light of day in this or any other collection of patriotic songs.

To Coban's song hit, "Over There," is rightfully given first place in the library of congress collection. Follow-

Pluck of Mother Wins Parole for Her Son

A mother's self-sacrificing heroism in coming through a railroad wreck and refusing hospital treatment in order to hurry to Philadelphia to make an appeal for the liberty of her son won a parole for Frank O'Brien, of Binghamton, N. Y.

Mrs. O'Brien arrived in court with her clothes torn and her arms severely bruised as the result of the train wreck.

Mother's Stocking Loses \$2,400 Saved by Twins

New York.—Marjorie and Thelma White, sixteen-year-old twins, made a big hit in dancing and singing with Fred Stone in "Tip Top," which just ended a long season on the road. The White twins were accompanied by their mother, Mrs. Harry White of 5000 Broadway.

The mother and daughters went through the trying experience of being snowbound for three days last February on the Montana prairies with the "Tip Top" company, after which Fred Stone, comedian, embraced religion in Butte. The twins witnessed the conversion.

Mrs. White is a frugal woman and while the company was on the road she laid aside \$2,400, which she pinned in her stocking.

After their matinee performance at the Riverside theater the twins returned with their mother to their apartment.

When Mrs. White, with her twins, reached the theater for the evening performance she felt a pin sticking in her leg below the knee. It was a safety pin used to attach the \$2,400 in large bills to her garter. The pin got loose and the season's hard-earned profits were lost.

"Don't cry, mother; we can earn more money," said Marjorie with a smile as her mother bemoaned the loss.

How City People Are Trying to Keep Cool



These photographs, taken in New York, are typical of the sights in all our large cities during the prevailing hot weather. The boys find the fountain is a fine swimming pool, and at night the parks are dotted thick with men, women and children who cannot sleep in their hot, stuffy homes.

Flying Flivver Is Now Assured

New Invention Is Expected to Put
Plane Within Reach of
Every Family.

The "flying flivver" has literally and suddenly come into the sky. Although the pioneer was wrecked, aeronautics experts believe that flying flivvers soon will become as plentiful, relatively, as their namesakes. The new experiment in human flight proved itself before it crashed upon a Jersey tree in an attempted flight from New York to Washington.

The nickname of the Dewoitine cross between a glider and a regular airplane is befitting in respect of weight, size, fuel requirements, relative speed and probable construction cost. Emil Dewoitine is quoted as having said that the machine can and will be manufactured in quantity at a retail price of \$400. Georges Barbot, the pilot, has said that the craft would cover 125 miles on a gallon of gasoline. But in respect to practical usefulness, as a means of aerial transportation of persons or goods, the flying flivver gives no promise of living up to the flivver reputation, in the opinion of aviation experts.

The Dewoitine machine is different from a motorless glider chiefly in that it has a motor. To withstand the vibration of the engine, the wing surfaces and skeletons and the body had to be constructed more strongly than in the case of a glider. This meant additional weight, and, together with the weight of the motor itself—said to be only forty pounds—made the whole craft considerably heavier than a glider. The total "tonnage" of the flying flivver was about 400 pounds, without the pilot, which is double the average weight of man-carrying gliders. And successful man-carrying gliders have been made weighing even less than the average of 200 pounds.

The Dewoitine craft is different from a regular airplane mainly in that the motor is of much lower horsepower and the whole machine is smaller and lighter. The motor mounted in the flying flivver is a two-cylinder Clerget of twelve horsepower. Ordinary small airplanes carry 100 horsepower motors, on the average; though constant improvements in propeller and wing design are gradually lowering the horsepower requisite in proportion to the weight of machines. The Sperry fast messenger plane, recently tested over Long Island, has a 60-horsepower engine. This plane is one of the smallest in the country, however.

In point of size the Dewoitine invention measures 40 feet from wing tip to tip and 15 feet over all in length. The craft is a monoplane, and even with the 40-foot spread its wing area is less than the average airplane. It is just about equal, however, to the total wing surface of many small types of comparatively high speed one-seater planes, which have more powerful motors, weigh much more, but can sustain their weight with the small wings by virtue of their swiftness.

Extends Power of Gliders.

The power equipment of the flying flivver, small though it be, is enough to do away with the limitations peculiar to motorless gliders. Its additional weight, however, is not too great to prevent powerless gliding. A glider cannot start flight from level ground. Ordinary glider flights are begun from hilltops, by rolling the craft downhill until they pick up "flying speed" and take off from the slope. Where hill-sides are less steep or long, catapult devices have been used to help supply the initial flying speed, but with little success on the whole. H. J. Nordman used an elastic rope to propel his "sailplane" into the air from the highest mound at the golf links near Bayside, L. I., in a recent series of flights.

The seemingly impossible feat of making a motorless winged craft climb up in the sky is possible because of the presence of upward movements of

the air. The fact that air currents do move upward and downward as well, is often overlooked because such currents are rarely encountered near the earth's surface, and never in areas where the surface is flat and smooth. Obviously, a down-moving current is deflected when it nears the earth, and spreads out in a sort of radial wind movement. It is plain, too, that an up-moving current cannot originate just at the earth's flat surface, because it would cause a vacuum there.

The currents by virtue of which gliders can keep their altitude or even climb, are not called winds, usually defined as horizontal natural movements of air. They are sometimes technically known as "winds with a vertical component." Soaring birds, such as hawks and eagles, the natural gliders, take advantage of these upward-flowing vertical or inclined movements of air, to fly and climb for hours at a time without flapping their wings or exerting themselves in any way except to maintain their balance and steer in areas where the air movement is favorable. There is no doubt, though, of course, there is no direct proof, that these soaring birds have an instinctive sense of rising or falling—a sort of exceedingly sensitive natural altimeter—by which they pick out the upward-moving areas of air. Gliding is merely man's way of imitating the soaring birds. And man must use his common sense and intelligence and judgment in place of the soaring birds' instinctive sense of rising or falling, to spot the correct place to glide.

Some aeronauts prefer to call these motorless aircraft "sailplanes" instead of gliders, which is the term more commonly applied. H. J. Nordman, inventor of the craft that recently made several flights over golf links near Bayside, refers to his machine as a sailplane.

Downward Air Currents.

Glider pilots have to guard in particular against the downward air currents. It is obvious that in the total of all air movements over the earth's surface the speed and volume of the rising currents equal the speed and volume of the falling currents. The falling currents are what, in the pioneer days of aviation, were known as "air pockets," regarded with dread. The slow-flying airplanes of those days, like the Dewoitine flying flivver, were more subject to downward eddies of wind and were less safe for that reason. The faster a plane is moving through the air, the less effect will it feel in reaction to air eddies, or "bumps," as the aviators call them. This fact is somewhat of an obstacle to the future popularity of flying flivvers, which must be a relatively slow craft when not gliding. If it is to combine the elements of gliding and of powered flight.

The flying flivver's power equipment is just sufficient to give the craft a start from level ground, without the aid of a catapult or any other starting device. And in the air the motor makes it possible to continue flight in aerial conditions that do not permit powerless gliding. The flying flivver driver can fly in still air, or even in moderate downward currents, and seek out areas favorable to gliding.

This glider of course cannot do. When the flying flivver pilot reaches an area in which the air is rising, he can throttle down or even perhaps "kill" his motor, and fly his sailplane machine as a glider. A regular airplane can do the same thing, by rolling the craft downhill until they pick up "flying speed" and take off from the slope. Where hill-sides are less steep or long, catapult devices have been used to help supply the initial flying speed, but with little success on the whole. H. J. Nordman used an elastic rope to propel his "sailplane" into the air from the highest mound at the golf links near Bayside, L. I., in a recent series of flights.

The seemingly impossible feat of making a motorless winged craft climb up in the sky is possible because of the presence of upward movements of

a flying machine glides, or volplanes, to the vertical distance it lowers itself in doing so; meanwhile retaining its "flying speed," or normal rate at which it remains under full control of the pilot. The ratio of six to one is a conservative average figure for airplanes. That is to say, an average airplane with its motor shut off at an altitude of 1,000 feet can volplane a horizontal distance of 6,000 feet under control before it comes to land.

An efficient glider has as good an angle of glide as an efficient airplane. But the important difference is that the glider travels more slowly. Assuming in the foregoing case, for instance, that the airplane would normally glide to the earth, through the 6,000 feet from a height of 1,000, in one minute, the glider, with the same gliding angle, but much less speed, might take two, or even three, minutes to glide the same distance. The difference is due to the varying flying speed. The flying speed of an airplane or glider is the minimum speed it must maintain in order to fly forward on a level under full control. It is, therefore, practically the same as the speed of the craft at the moment it takes off, when the speed just begins to provide "lift" enough to overcome the weight of the machine. Flying speed not only varies with different types of planes, according to design and ratio of wing area to weight, but also varies from time to time in an individual plane, according to loading and to the condition of the wings and other essential parts at the moment. An airplane with a flying speed of 50 miles an hour with pilot only aboard will necessarily require a slightly higher flying speed with a passenger also aboard. Mere speed must be attained to supply the additional lift. A plane with its wings newly "tuned up" to afford maximum efficiency will gradually require a higher flying speed thereafter, as the wings sag and warp out of best alignment under the strain of usage.

Flying Speed.

Flying speed in general is governed by the ratio of wing area to weight. The larger the total wing surface is in proportion to the weight of the airplane or glider, the less is the flying speed. The less number of pounds that each square foot of wing surface has to sustain the slower the wing must pass through the air. The object in glider construction, therefore, is to provide as great wing area as possible in proportion with weight. This makes for low flying speed, which facilitates the gliding and climbing. It permits such low flying speed that gliders, much more frequently than airplanes, do the trick of seeming to fly backward, as the Dewoitine machine did at Roosevelt field. This is due merely to gliding or flying headed into a wind with a velocity greater than the flying speed of the craft so that, while the craft is moving forward fast enough to keep balance, it is moving backward relatively to the earth.

The flying flivver, like its immediate parent the glider, seems fated to become a sporting and pleasure machine, rather than a practical commercial vehicle of general usefulness. The glider has already become a popular "play toy." In Switzerland and in the Hartz mountains in Germany, gliding was a familiar pastime last winter. The snow-covered hillsides were good places for taking off, with skids instead of heavier wheels on the machines; and the snow-covered valleys afforded equally good landing places. With its possible very low cost, and with its range of performance considerably greater than that of the glider, the flying flivver will perhaps soon become a successful competitor of the automobile runabout and the motor boat, as a thing of sport. But its significance scarcely exceeds that, because the gliding feature is available only under rare aerial conditions, and at that in few locations.—New York Times.

Italians Settling in Mexico. Mexico City.—Italian emigrants are expected in large number in Mexico, and probably will settle in the states of Tamaulipas, Jalisco, Tabasco and Nuevo Leon. Arrangements for their colonization have been made by agents of the Italian emigration service at Washington. The first batch of arrivals probably will number 900.

"Perfect" Youth Gets Silk Flag



Gerwin Neuber, age seventeen years, considered the hundred per cent American youth by his fellow students in the high schools of Los Angeles, being presented with a silk flag by J. Harvey McCarthy.

ing hard upon it is Irving Berlin's "Oh, How I Hate to Get Up in the Morning." A few of the songs there are which were hits both at home and with the A. E. F. Among these are "Madelon," the great French marching song, by all odds the finest thing in the musical line that came out of the war; also "Keep the Home Fires Burning," which, because of its sentiment and rhythm held a great appeal for the boys, and the "Long, Long Trail," which was of tremendous popularity as a marching song.

But such masterpieces as "K-k-k-katy, Beautiful Katy," and "Keep Your Head Down, Fritz! Boy," although prime favorites with the A. E. F., lived over there only in their revamped versions, depicting not the original Katy, but the horrors of K. P., and "Keep Your Shade Down, Mary Ann," and other verses which cannot be reproduced here.

"Joan of Arc" may have been good stuff for the folks back home, but "Mother, Take Down Your Service Flag, Your Boy's in the S. O. S.," was far more admired by men in the ranks, while the war risk insurance classic, "Ten Thousand Dollars to the Folks Back Home," sung to the wailing strains of the "Dead March" from "Saul," superseded all other melodies when a platoon was returning from the bombing field.

Print Hospital Songs.

Thanks to the refining influence of the Red Cross nurses, it has been possible to produce a few of the hospital songs.

The following one attained great popularity at the base hospital at Savenay, where the wounded were routed home. It runs to the tune of the "Old Gray Bonnet":

Get out that old broken sibia
And patch it to the tibia
And pack the whole d-d thing in a
cast—

Still another of anatomical significance wailed to the tune of the "Good Old Summer Time":

In the base at Savenay
Where the sick and wounded lay,
Running up their temperatures,
More and more each day—

The magnificent song of the artillery, "When Those Caissons Go Rolling Along—Hear Them Rolling," left its mark on the A. E. F.; so did "The Marine's Hymn," and "Oh, the Infantry," but "Goodby, Broadway, Hello, France" is a stranger to the soldier who really did the fighting.

In spite of frantic appeals to the music publishers at home, few came across with anything which left its stamp on the doughboy overseas.

It was with a song of his own composition, a ditty reeking with the open-air coarseness of the battalion minstrel and wit, that he bore the agonies of revellie or the last lap of a terrific march.

1,453 Words Sent in 6 Minutes by Teltautogram

Paris.—A test of the Bell teltautogram, a method of sending written script by wire, between Lyons and Malmanson, showed the machine capable of sending 1,453 words in six minutes at a cost of 20 francs. By ordinary wire it would require 20 minutes and cost 215 francs, about \$13.