



An early morning bird drop as practiced by the Vanderbilt University research team. The bird, just free of the tethered sack, will shortly begin his glide and the TG-2, closing from the left, will follow, taking glide measurements.

ONE FOR THE BIRDS

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We have under construction at Vanderbilt University a unique research airplane with rather interesting performance figures. Many of you will remember Bruce Carmichael's paper, "Possibility for a One Foot Per Second Sinking Speed" which appeared in the January, 1962, issue of *Soaring*. This fine paper presented an analysis of the problems involved in reaching this low sink rate and suggested a possible solution. The glider we are building should have a minimum sink rate of 1 ft./sec., although this was not the primary objective in its design. Our primary specifications were for a stalling speed of 20 mph and glide ratio equal to, or better than, that of the birds we are testing. As it turns out these specifications also lead to a very low sink rate. This machine was designed by the author for use in a bird-flight research project in progress here under National Science Foundation sponsorship.

The research project, which is under the joint direction of Dr. Charles E. Farrell, Associate Professor of Biology, and the author, is concerned with measuring the gliding flight characteristics of several species of soaring birds, such as the Black Vulture, Turkey Vulture and Frigate-Bird. Two different measurement systems are used in this work.

The first system employs a modified TG-2 sailplane.

The procedure with this system is to catch, unharmed, a supply of the wild birds to be measured. The birds are then weighed and the wing area measured with a photographic technique we have devised. Each bird is marked with a temporary plastic band on one leg. Flight measurements are made in the usually quiescent atmosphere which exists for about two hours just after dawn. In order to make the maximum number of flights per day it is necessary for us to be lined up on the runway ready to fly at official daylight. The towplane is loaded with a helper who holds a sack on his lap containing a bird to be measured. The closed end of the sack is attached to the seat frame with a strong cord which is long enough to allow the sack to approach but not touch the tail surfaces. The helper keeps the bird contained by holding the other end of the sack closed with his hand. Most helpers become expert at this immediately.

The glider is then connected to the towplane and away we go. At the predetermined release altitude (we usually use 2500 to 3000 feet) the glider releases and both glider and towplane fly a pattern so that the towplane flies above and in front of the glider. At this point the towplane slows down and the helper drops sack and bird over the side. The bird falls out of the sack when the limit of the cord is reached and