GENERAL NOTES

The effect of radar on birds.—The publication of this war time observation was delayed pending the removal of security classification from the equipment used. Recently, the United States Air Force dropped this radar from the restricted list, permitting the publishing of the characteristics of the equipment, without which this report would be of little value to investigators in the field of avian orientation.

In the fall of 1943, I was in charge of a group of military personnel engaged in tracking aircraft over the ocean off the east coast of the United States. The radar set was emplaced in the dunes not far from the high tide line. During a lull in operation, a large flock of scaup (*Aythya* sp.) and scoters (species?) was seen flying parallel to the coastline a few hundred yards off shore and approaching our position. Having nothing better to do at the moment, we idly swung the parabolic antenna around and pointed it directly at the flock. The result was immediate and dramatic. The once orderly group of birds became a bewildered mass of individuals which flew in circles, missed wingbeats, and performed many unbirdlike gyrations. Some observers later insisted that a few birds accomplished loops and rolls although I never observed this. As the beam was diverted by elevating the antenna, the flock regrouped and proceeded down the coast in the original direction.

To verify this unusual behavior as being caused by radar, the experiment was repeated several times on subsequent occasions. In each case, the result was essentially the same, the response of the stimulated flock coinciding with the incidence of the beam upon the birds, the cessation of response coinciding with the diversion of the beam. The intensity of reaction appeared to vary inversely with the distance between the radar and the birds and some individuals were affected more than others. There also seemed to be some relationship between the angle of incidence and the intensity of response but this was not clear.

The electrical characteristics of this radar are quoted for those working in this field: wave length 10 centimeters (3,000 megacycles), crystal controlled; peak power 210 kilowatts; average input 540 watts; average output 280 watts; pulse recurrence frequency 586; pulse width 0.8 microseconds; beam width 1.4 degrees; maximum range 70,000 yards.

Although it is not the purpose of this report to speculate upon the nature of the mechanism involved in the detection of electromagnetic radiation by birds, one cannot help but wonder if the behavior described above does not support the theory that birds indeed perceive the earth's magnetic field. In flight, the crossing of these lines of force may result in the production of phosphenes, or perhaps the answer lies in the setting up of tiny oscillating currents somewhere in the animal's central nervous system.—O. A. KNORR, *Department of Biology, University of Colorado, Boulder, Colorado, April 20, 1954.*

Evening flights of the Southern Everglade Kite and the Blue and Yellow Macaw in Surinam.— The Southern Everglade Kite (*Rostrhamus s. sociabilis*) is, in the coastal area of Surinam, a common bird in freshwater marshes. It is often seen on poles or fences along rice fields, on the lookout for snails. This habitat it shares with the Southern Limpkin (*Aramus g. guarauna*), in Surinam called "Krau-krau," after its call note which is a characteristic sound at night or in the early morning in these places. The rice fields are only feeding areas where, owing to lack of cover, the birds are unable to breed.

The Everglade Kite is particularly numerous in the rice-growing district, Nickerie,