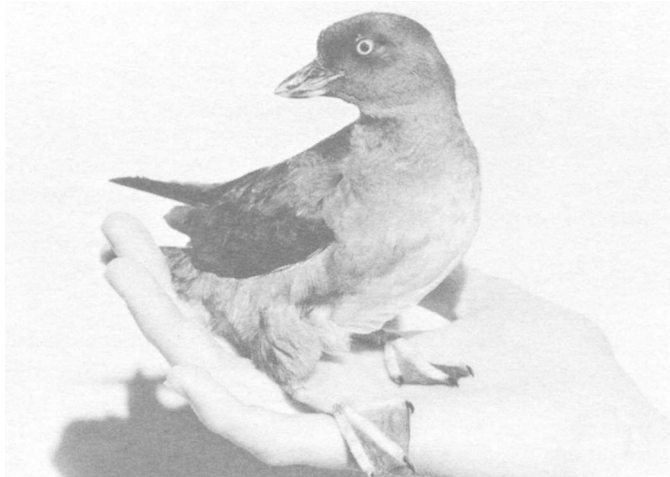


Effects of oil on birds

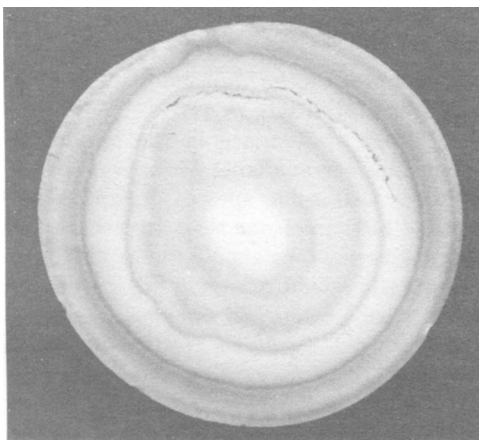
A seabird covered with oil is a dramatic symbol of the environmental problems that a petroleum-dependent society faces. The effects of less extreme contamination of birds are not well known, however; and, in particular, little is known about the effects of oil on reproduction in birds.

In combined laboratory and field studies of the effects of oil pollution on avian reproduction, laboratory quail and wild auklets are being dosed with small amounts of fuel and crude oils. In the quail studies, it was found that 200 mg. Bunker C oil (a heavy oil used in ships) depressed egg production and hatchability for 3 days. An Alaskan North Slope crude oil (800 mg.) affected total egg production and shell quality, but did not reduce hatchability of intact eggs. The structure of yolk and its stained appearance were altered by these and other petroleum oils.

Quail are not seabirds, however, and application of laboratory techniques to free-living birds is not easy. In collaboration with the Point Reyes Bird Observatory, and with NOAA support, a study of Cassin's Auklets is now being carried out on the Farallon Islands of California. Knowledge of the auklet's responses to oil may help in understanding the impact of spilled oil on populations of breeding seabirds.



A rare close-up view of Cassin's auklet, a bird that spends most of its time on the open ocean along the Pacific coast. The Department of Avian Sciences at UC Davis, in cooperation with the Point Reyes Bird Observatory, is studying the effect that the ingestion of oil has on the development of auklet yolks and upon reproductive success.



Quail yolk structure disrupted by ingestion of bunker oil.

Joan Dobbs photo



Mongolian pheasants in rearing pen.

Research in game bird production

The demand for pheasants, partridge and quail for stocking shooting clubs, dog trails, and other recreational areas has increased dramatically over the past decade.

Our research is helping meet game-bird production needs. For instance, these birds respond sexually to changes in day length or photoperiod. They normally lay eggs and produce young only during the spring months. But we have found that two popular game birds, the Ring-necked pheasant (*Phasianus colchicus*) and Red-legged partridge (*Alectoris gracea*) could be induced to lay in two or more 10-week periods per year by subjecting them to alternating 13-week periods of stimulatory light (16 hours light, 8 hours darkness) and 8-week periods of nonstimulatory light (8 hours light, 16 hours darkness). Annual egg production was increased from 50 to 100 eggs per hen in the pheasant and from 35 to 70 eggs per hen in the partridge.

In populations of birds cycled to rest under non-stimulatory light, it is important that the long dark period is not interrupted with flashes of natural or artificial light. The intensity of light should be reduced to 5 lux or to a level which will permit birds to see to eat and drink. For some unexplainable reason males require longer than females to reach sexual maturity. Consequently, our research has shown that males should be given stimulatory light two weeks ahead of the females in order that both sexes mature at the same time.

Age of the bird at time of stimulation is important. Although some partridge hens can be induced to lay as early as 161 days of age, our research showed that they should be at least 200 days of age when stimulated.

We also found that partridge grew faster under continuous light or under cycles of light and darkness in which the period of darkness is less than two hours.

Although our work has been with species of game birds generally raised for the industry, we plan to explore the feasibility of using controlled lighting to increase the annual output of young from species considered endangered or those that exist as a limited population in captivity.

-Allen Woodard