0.6, 0.5–1.0 and 1.2–1.8% for the three study periods.

Within the past 15 years, blackbirds have become the specific targets of new avicidal chemicals. Apparently no one has investigated possible hazards to adult birds not killed by these compounds or to their offspring. We hope that this report will lead to more widespread observations to detect abnormalities in birds which come into contact with agricultural chemicals.

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THE UROPYGIAL GLAND OF THE SOOTY TERN

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The classical experiments of J. B. Watson and K. S. Lashley (1915) on the Sooty Tern (*Sterna fuscata*) resulted in the now widely accepted idea that this bird becomes waterlogged if it rests on water. In one of a series of tests on Sooty and Noddy (*Anous stolidus*) terns, the authors reported (1915:39): "One noddy and one sooty were held in the water and at times immersed in it for a period of 10 minutes. The birds were then placed gently on the surface. The noddy immediately raised itself and flew over to the land. The sooty was helpless under these conditions. While in the water it floundered about, getting the tips of its wings out, but could not rise. Since it was becoming more and more waterlogged, I rescued it . . . ." In other tests, the two terns were placed in cages over water; Sooty Terns, but not Noddy Terns, became waterlogged in as little as 25 min. The conclusions from these tests that Sooty Terns become waterlogged and may drown if they alight on water have led subsequent investigators to speculate on their pelagic behavior. For example, Ashmole (1963:30) in his studies of the breeding and feeding biology of these terns believed that they "would never deliberately rest on the water for more than a minute or so . . . ." Sooty Terns normally feed by dipping, without plunging below the surface (Ashmole and Ashmole 1967). Austin (1961:133) stated: "The Sooty Tern, one of the most pelagic of all terns, practically never enters the water, but snatches its food daintily from the surface in flight. Another pelagic species, the Noddy, often settles on water where fish are schooling and feeds like a gull." Dinsmore (1972:171) reported that Sooty Terns ". . . apparently seldom rest on water. As Sooties inhabit the open oceans during the nonbreeding season, birds from some colonies must fly continuously for 6 months or more." Finally, Serventy et al. (1971:29) noted: "The Sooty Tern can apparently sleep on the wing—or do without it altogether—for it is found over the open oceans many days from land and cannot rest on the sea since its plumage becomes waterlogged owing to the inefficiency of the preen gland."

Although waterlogging in the Sooty Tern might be due to a number of factors (e.g., feather structure or chemical composition of the preening oil), the present report addresses itself solely to this species' uropygial gland as it might relate to the putative waterlogging property.

Weight. In 1860, Crisp presented data that suggest uropygial glands of waterbirds are heavier than those of landbirds. Elder (1954) and Kennedy (1971) subsequently confirmed Crisp's belief. Nonetheless, variations in uropygial gland weights are poorly understood and scantily documented. In conjunction with my investigation emphasizing *S. fuscata*, glands from 5 genera and 13 species (including *fuscata*) of terns were weighed and compared with the birds' fresh body weights. Body weights ranged from 46 g (*S. albifrons*) to 698 g (*S. caspia*). Body weight and uropygial gland weight are positively correlated (Fig. 1; regression line, least squares method, $r = 0.87$). Specifically the

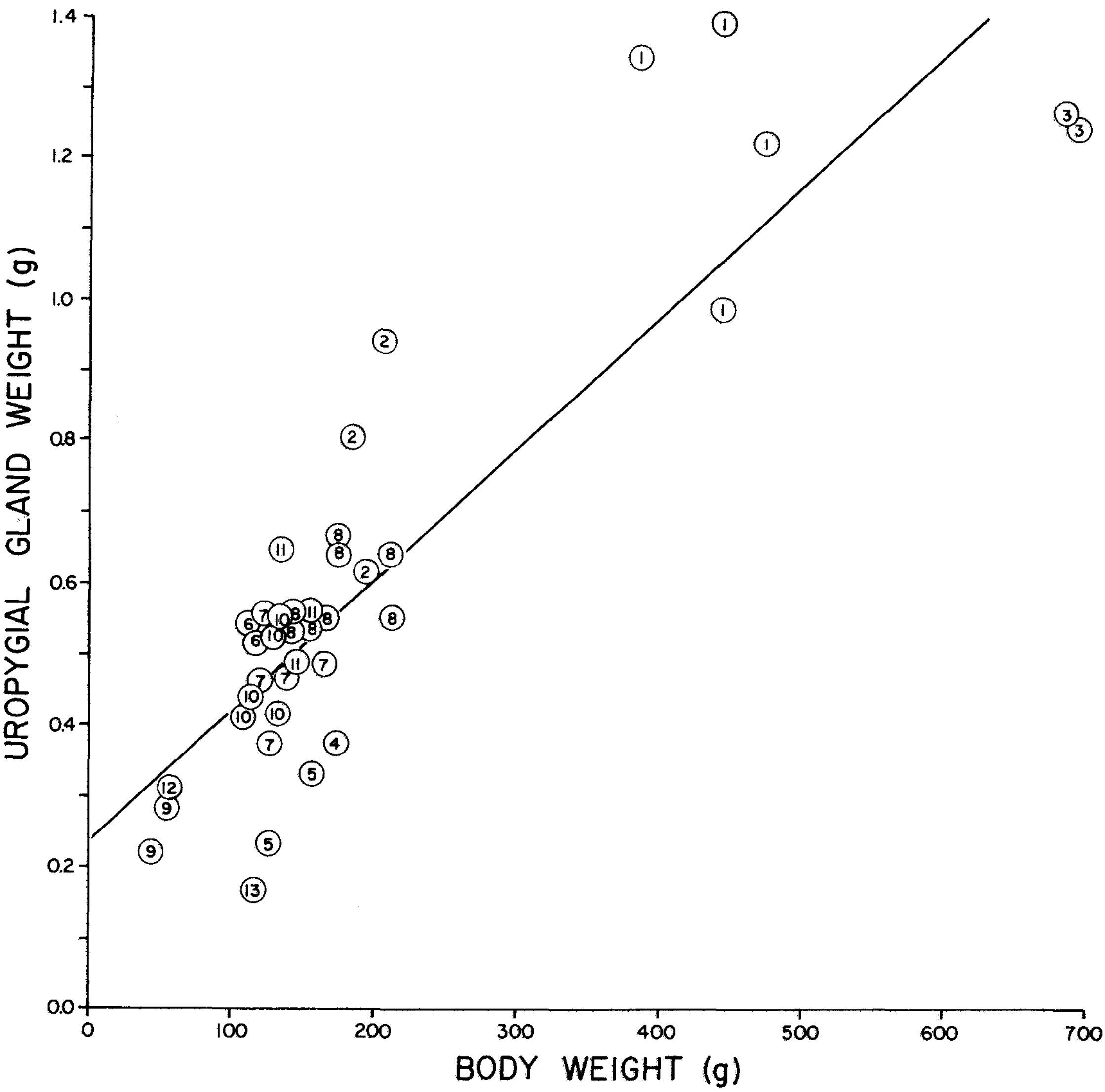

FIGURE 1. Relationship between body weight and uropygial gland weight in 13 species of terns. 1 = *Sterna maxima*, 2 = *S. sandvicensis*, 3 = *S. caspia*, 4 = *Anous stolidus*, 5 = *Larosterna inca*, 6 = *Gygis alba*, 7 = *Sterna hirundo*, 8 = *S. fuscata*, 9 = *S. albifrons*, 10 = *S. anaethetus*, 11 = *S. forsteri*, 12 = *Chlidonias niger*, 13 = *S. paradisaea*.

values for *S. fuscata* (number 8 in Fig. 1) do not differ markedly from those of the other 12 species. Mean uropygial gland weights expressed as a percent of body weight are 0.33 (n = 10, SD = ±0.05) in *S. fuscata* and 0.31 (n = 31, SD = ±0.11) in the other terns. Thus, the uropygial gland of *fuscata* is approximately the same relative size as glands in the other terns studied.

Kennedy (1971) also found a strong correlation between body weight and uropygial gland weight in House Sparrows (*Passer domesticus*) and a variety of water- and landbirds. In addition, he found some intraspecific variation that might be attributable to seasonal variation in weight. I found some intraspecific variation, apparently less in the small species than in the larger ones. Most of the terns were breeding, so that variation was probably not due to seasonal differences or to differences in androgenic levels, which are reported to affect gland secretion (Maiti and Ghosh 1972).

Extractable components. Uropygial gland secretions consist "predominantly [of] ester waxes . . ., the compositions of which are characteristic for single orders or even families" (Jacob 1978:165). Many functions have been proposed for these secretions over the past century (see Law 1929, Elder 1954); at least in waterbirds, they impregnate the feathers and improve their waterproofing property, thereby enhancing the birds' swimming ability (Jacob 1978:203). I did not analyze the chemical composition of tern gland secretions in the present study but extracted total fat-soluble components from individual glands by a technique previously described (Johnston 1976). Glands from five *S. fuscata* contained a mean of 7.9% extractable lipids (percent of gland weight; range = 6.6–9.2; Table 1). Eleven glands from five other tern species had a mean of 17.6% (SD = ±5.3, range = 11.5–28.8). By comparison, glands from 10 species of waterbirds (Adélie Penguin [*Pygoscelis adeliae*], geese, loons, ducks, Pied-billed Grebe [*Podilymbus podiceps*]) had a mean of 26.5% (SD = ±6.3, range 17.2–38.7). It appears, therefore, that (a) tern glands as a whole contain quantitatively less fat-soluble material than do those from some

TABLE 1. Extracted lipids from uropygial glands in terns, as percent of gland weight.

Bridled Tern (*Sterna anaethetus*)	11.5, 13.2
Caspian Tern (*S. caspia*)	19.5, 21.8, 23.6
Sooty Tern (*S. fuscata*)	6.6, 7.2, 7.2, 9.2, 9.2
Common Tern (*S. hirundo*)	13.7, 15.2, 15.6
Royal Tern (*S. maxima*)	28.8
Sandwich Tern (*S. sandvicensis*)	13.8, 16.3

$\bar{x}$ *S. fuscata* = 7.9
$\bar{x}$ and SD other 5 tern species = 17.6 ± 5.3
$\bar{x}$ and SD waterbirds[1] = 26.5 ± 6.3

[1] *Pygoscelis adeliae, Anser albifrons, Chen caerulescens, Morus bassanus, Gavia immer, G. stellata, Mergus serrator, Anas fulvigula, Aix sponsa, Podilymbus podiceps.*

birds that typically swim and (b) the gland of Sooty Terns contains less fat material than do those of other terns studied here. This deficiency of uropygial oils in Sooty Terns is probably a major factor contributing to the species' putative waterlogging quality.

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RING-BILLED GULLS FEEDING ON DATE FRUITS

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Gulls are well known as opportunistic feeders that forage in various ways in many different habitats. I report here on Ring-billed Gulls (*Larus delawarensis*) obtaining ripe fruit from date palms (*Phoenix dactylifera*), an activity apparently not reported previously (Elmer, Carpenter, and Klotz, F.A.O. Plant Prot. Bull. Part 1. 16(5):3–17, 1968; J. B. Carpenter, pers. comm.). Gulls have been known to eat cherries, blueberries, and strawberries (Cottam, Condor 37:170–171, 1935; Cottam, Condor 46:127–128, 1944; Greenhalgh, Condor 54:302–308, 1952) in some areas, and in Florida Ring-billed Gulls have been seen picking fruit from cabbage

FIGURE 1. Ring-billed Gulls feeding at a date palm near Calexico, California.