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Roger D. Applegate

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Roger D. Applegate
Maine Cooperative Fish and Wildlife Research Unit
University of Maine
Orono, ME 04473

c/o Wildlife Division
Maine Department of Inland Fisheries and Wildlife
P.O. Box 1298
Bangor, ME 04401

Ornithologists have long debated as to whether vultures have a sense of smell which allows them to locate carrion, whether they just have acute vision, or use a combination of smell and sight. Many of the older observations on vulture olfaction were summarized by Bent (1937: 22-23, 37-38).

Audubon and Bachman (Bent 1937:37) conducted tests involving Black Vultures *(Coragyps atratus)* that supposedly refuted that vultures had a sense of smell. Vultures did not detect odorous carrion that was in (a) vegetation, (b) a brush shelter, or (c) covered by canvas. In this latter test, the vultures ate a piece of fresh meat placed on top of a canvas covering some carrion. Chapman (in Bent 1937), after hiding carrion in a house, concluded that vultures could smell. Turkey Vultures *(Cathartes aura)* were attracted to putrid odors from pig offal in a woodshed (Sayles 1887), and Hopkins (1888) gave examples which indicated that vultures were able, in part, to detect food by smell. Davis (1941) reported attraction of vultures in Cuba to *Stapelia nobilis,* a flower that smells like rotten meat. Elaborate experiments by Smith and Paselk (1986) using three odorants associated with animal decomposition (butanoic acid, ethanethiol, and trimethylamine) with Gaussian gas dispersion equations shed some doubt on the importance of smell to Turkey Vultures.

The presence of anatomical structures in vulture nasal fossae that have potential olfactory abilities (Bang 1960, Bang 1968, Stager 1964), along with hunting behavioral traits that would require olfaction (Bang 1968, Stager 1964), support the experimental findings of Owre and Northington (1961) and Stager (1964) that vultures do smell carrion.

On 13 September 1989, I caught a Turkey Vulture in a 37.5 x 37.5 x 90 cm wire cage trap set for fishers *(Martes pennanti)* (Arthur 1988). The trap was located in Monroe, Waldo County, Maine. The trap was positioned beneath the canopy of a red maple *(Acer rubrum),* white birch *(Betula papyrifera),* and balsam fir *(Abies balsamea)* woodland and was concealed in a cubby entirely covered with fir boughs and baited with caribou *(Rangifer tarandus)* meat. The trap would not have been visible either above or below the forest canopy, as it was beneath a dense overstory of fir.

Does this demonstrate olfactory ability on the part of vultures? I think so. However, Darlington (1930) and Taber (1928) concluded that vultures might detect carrion by seeing and hearing swarms of flies and beetles attracted to it. Because of warm weather, flies were active and attracted to the trap bait during the period reported here. However, I doubt that the vulture could see swarms of flies any better than it would be able to see the trap and its bait; and the experimental evidence of Stager (1964) demonstrates the unlikelihood that vultures hear flies. As to whether the vulture could see flies, that remains to be tested. In this case, the vulture may have seen bird or small mammal activity. This long standing debate can only be solved by carefully designed experiments.

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Recent Literature

BANDING EQUIPMENT AND TECHNIQUES

Band wear on Short-tailed Shearwaters *Puffinus tenuirostris*. R.D. Wooller, I.J. Skira and D.L. Serventy. 1985. *Corella* 9:121-122. -Biol. Sciences, Murdoch Univ., W.A. 6150, Australia -(Monel bands averaged a loss of 1.2% of initial weight annually, with no apparent difference imposed by sex of the wearer.) MKM

Nasal saddles for Pacific Black Duck *Anas superciliosa* and Austral teal. C.C. Davey and P.J. Fullagar. 1985. *Corella* 9:123-124. -CSIRO Div. of Wildl. & Rangelands Res., Box 84, Lyneham, A.C.T. 2602, Australia. -(Notches and color inserts allowed observers to increase the number of individually recognizable birds and monofilament line with glue allowed better attachment to two species of teal. Ducks have been seen with their saddles more than 3 years after marking, and marked Pacific Black Duck and Grey Teal have been known to raise broods successfully.) MKM

Declining rates of capture of birds in mist-nets. R.D. Wooller. 1986. *Corella*10:63-64. -Biol. Sciences, Murdoch Univ., W.A. 6150, Australia. -(Birds caught during non-breeding season declined over 7 days, although a high recapture rate indicated that several species were sedentary at least over short periods.) MKM

Feather-clipping in a Nauruan technique for short-term recognition of individual birds. S. Garnett. 1987. *Corella*11:30-31. -Garden of St. Erth, Blackwood, Vic. 3458, Australia. -(Describes the clipping of distinct patterns on primaries of Great and Least Frigatebirds for an unusual sport on the island of Nauru, generally allowing individual recognition of birds at 30 m with the naked eye and 300 m with binoculars. A similar technique may be useful for studies requiring short-term identification of specific birds with less disruption to the bird than some other types of individual marking.) MKM

Data record cards: their history and method of use. S.G. Lane. 1987. *Corella* 11:121-123. -Fairview Rd., Moonee, via Goffs Harbour, NSW 2450, Australia. -(Design approved by Australian Bird Study Association, with examples of use.) MKM

IDENTIFICATION, MOLTS, PLUMAGES, WEIGHTS, AND MEASUREMENTS

Data exchange. Weights and measurements. Brown Goshawk *Accipiter fasciatus*. J. Klapste and P. Klapste. 1985. *Corella* 9:126. -Dept. of Applied Biol., Royal Melbourne Inst. of Technology, 124 LaTrobe St., Melbourne, Vic. 3000, Australia. -(Total length, tail, wing span and weights of 8 adult males, 15 juvenile males, 65-68 adult females, and 60-62 juvenile females.) MKM

Dovekie juvenile plumage dimorphism. L. Stempniewicz. 1989. *Colonial Waterbirds* 12:123-125. -Dept. Vert. Ecol. & Zool., Univ. Gdansk, Gzolgistow 46, 81-378 Gdynia, Poland. -(Juvenile Dovekies in Spitzbergen occur in two forms: a predominant morph much like the breeding plumage of adults, and a "white-bibbed" morph, constituting about 10% of the chicks present there. No differences between forms were detected in growth parameters or timing.) MKM