NOTES

OBSERVATIONS ON A WHITE-SIDED DOLPHIN, *LAGENORHYNCHUS ACUTUS*, PROBABLY KILLED IN GILL NETS IN THE GULF OF MAINE

On 20 July 1976, a white-sided dolphin, *Lagenorhynchus acutus,* was observed floating with its beak out of the water on Jeffreys Ledge, Maine (lat. 43°09'N, long. 70°04'W). The 201-cm long female weighed 113.2 kg and was freshly dead, still bleeding freely from symmetrical injuries to the left and right sides of both the upper and lower jaws and the flippers. The lungs contained foamy materials and were mottled white, indicating drowning as the immediate cause of death. Many gill nets were present in the area, and the symmetrical nature of the injuries indicated that the animal had become entangled in the mesh, drowned, and perhaps been freed or discarded during hauling of the net. A humpback whale, *Megaptera novaengliae,* was entangled in a gill net for 2 h before freeing itself on the same day in the same general area.

Gross autopsy revealed several cysts in the abdominal muscles of the lower left side and a 5 cm × 7.5 cm yellow, pussy abscess 15 cm anterior and dorsal to the right mammary gland, perhaps caused by a bladderworm stage (plerocercoid) of *Monorygma grimaldi* (Geraci et al.[1]). No other parasites were found, although all major organs except the brain were inspected. Tissue and organ weights are shown in Table 1. The length and weight of this animal fit well on a regression line developed for this species (Geraci et al. see footnote 1). From a length-age relationship (Geraci et al. see footnote 1), it is likely that this female was between 2½ and 3 yr old, and was immature.

The stomach contained 980 g of food, including four 25- to 30-cm herring, *Clupea harengus,* three partly digested (total weight 340 g) and one skeleton (15 g); and one partly digested short-finned squid, *Illex illecebrocus* (anterior mantle length 17.5 cm, weight 90 g), with remains of 10 other squid of this species (represented by 5 complete pairs of beaks plus 5 single anterior beaks). Mean length of anterior beaks (± SD) was 1.42 ± 0.03 cm, corresponding to mantle lengths from 17 to 19 cm (Testaverde[2]). Also 10 left and 11 right otoliths from silver hake, *Merluccius bilinearis,* (mean size ± SD = 1.15 ± 0.06 cm) indicated consumption of at least 11 fish of 22-26 cm fork length (Nichy 1969).

From these data and the literature it appears that *C. harengus* and *I. illecebrocus* are staples in the summer diet of white-sided dolphins. A 161-kg female collected on 14 September 1954, off Cape Cod contained 12 fresh herring, digested fish (apparently herring), and squid (Schevill 1956). A 180-cm long male driven ashore with pothead whales, *Globicephala melaena,* in Newfoundland on 30 July 1954, contained herring and short-finned squid (Sergeant and Fisher 1957). Short-finned squid was the most common food in the stomachs of white-sided dolphins which mass-stranded at Lingley Cove, Maine, on 6 September 1974; however, no herring were found despite the fact that "brit" herring were present in the cove (Geraci et al. see footnote 1). Smelt, *Osmerus mordax,* remains, were found in five individuals; silver hake had been eaten by one individual; and unidentified crustacean remains were found in another stomach.

Schools of white-sided dolphins were unusually common in the Gulf of Maine in 1976, perhaps because squid were abundant, possibly as a result of this year's unusually high sea temperatures

[1]Geraci, G., S. A. Testaverde, D. J. St. Aubin, and T. H. Loop. 1976. A mass stranding of the Atlantic white-sided dolphin, *Lagenorhynchus acutus:* a study into pathobiology and life history. Unpubl. manuscr., 166 p. submitted to Marine Mammal Commission by New England Aquarium, Boston.

TABLE 1.—Tissue and organ weights of a *Lagenorhynchus acutus* from Jeffreys Ledge, Maine. Weights not corrected for blood loss.

Tissue or organ	Weight (kg)	Tissue or organ	Weight (kg)
Muscle	69.0	Left kidney	0.473
Blubber and fins	24.5	Right adrenal	0.011
Gastrointestinal tract	6.8	Left adrenal	0.010
Liver	3.2	Spleen	0.084
Heart	0.959	Right ovary	0.0051
Right lung	1.117	Left ovary	0.0047
Left lung	1.149	Bones[1]	5.4
Right kidney	0.476	Total	113.2

[1]Bones were bleached and dried in the laboratory.

[2]Testaverde, S.A. 1975. An informal discussion concerning the cestode *Phyllobothrium* sp. in squid, *Illex illecebrocus illecebrocus* and its possible relationship to marine mammals. Unpubl. manuscr., 20 p.

(Anonymous 1976; Prescott and Moore 1976). Silver hake, normally of variable abundance here (Bigelow and Schroeder 1953) was also abundant during 1976. On several different occasions, groups of 6-30 white-sided dolphins were seen by one of us (SKK) swimming close to pods of either finback whale, *Balaenoptera physalus,* or humpback whale, *Megaptera novaeangliae,* and apparently feeding with them.

Acknowledgment

We are grateful to the crew of the MV *Exxon Bay State* for procuring this specimen; to John E. Fitch, California Department of Fish and Game, for otolith identification; and to Fred Nichy, Northeast Fisheries Center, National Marine Fisheries Service, NOAA, Woods Hole, Mass., for providing data on otolith growth.

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RECIPROCAL HYBRIDIZATION BETWEEN THE CALIFORNIA AND GULF OF CALIFORNIA GRUNIONS, *LEURESTHES TENUIS* AND *LEURESTHES SARDINA* (ATHERINIDAE)

The California grunion, *Leuresthes tenuis,* and the Gulf of California grunion, *L. sardina,* are the only fishes that temporarily leave the water during spring high tides to deposit their eggs in beach sand (Walker 1952). The eggs develop in the nearly dry sand and hatch when uncovered and agitated by the surf of the next series of high tides.

The grunions have an allopatric distribution. The California grunion ranges from Monterey Bay, Calif., to Bahía Magdalena, Baja California Sur. The Gulf grunion is endemic to the Gulf of California, ranging from Bahía Concepción, Baja California Sur, and Guaymas, Sonora, Mexico to the mouth of the Río Colorado (Moffatt and Thomson 1975).

Recent comparisons show that morphological, physiological, and behavioral differences exist between the grunions. Morphologically very similar, the most diagnostic characterictics distinguishing them are lateral scale row counts; the mean number in *L. tenuis* is 75 and in *L. sardina* is 55. Gulf grunion adults are also significantly longer, more slender, have a smaller eye diameter, and are more lightly pigmented than those of the California grunion (Moffatt 1974; Moffatt and Thomson 1975). Gulf of California grunion have wider embryonic and larval thermal tolerances, a higher larval preferred temperature, and wider larval salinity tolerances (Reynolds and Thomson 1974a, b, c; Reynolds et al. 1976, 1977; Moffatt 1977).

Light response remains positive in Gulf grunion through adulthood, whereas the response shifts from positive in the larvae to negative in the adults of the California grunion (Walker 1952; Reynolds and Thomson 1974c; Reynolds et al. 1977). In response to the shorter wave period in the northern Gulf of California, the duration of the spawning act of the Gulf grunion females is much briefer than that of the California grunion females (Thomson and Muench 1976; Muench 1977).

Only recently has the congeneric status of the grunions been recognized (Moffatt 1974; Moffatt and Thomson 1975). Evidence to date indicates that the California grunion, the less primitive of the two species, has adapted to the less fluctuating tidal and thermal regimes of the California coast, following isolation from an ancestral type by the