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INTRACEPHALIC SOUND PRODUCTION IN TURSIOPS TRUNCATUS: BILATERAL SOURCES. JOHN C. LILLY, Communication Res. Inst., Miami, Florida

Tursiops truncatus (bottlenose dolphin) in addition to a sonar capability has means of production of two separate sounds simultaneously in an independent or a dependent relationship. By removing a Tursiops from the water and placing flat hydrophones in the proper positions on the head, the sounds from the separate sources can be observed and recorded independently. The results show that the major classes of sounds produced including whistles, slow clickings, fast clickings (intracephalic and air-borne) can be produced by at least two sources. Modulation of specific frequencies in the clicks can be achieved by two systems of air sacs, one on the right and one on the left side in the nasal passageway. Stereophonic listening and phase studies on the cathode ray oscilloscope show that these two sources can function independently or can be phase-locked in such a way as to cause an apparent single source to move from one ear to the other ear during stereophonic listening. Anatomical studies show that the system of muscles controlling these sound producers and modulators are innervated by the facial (VII) nerve and the trigeminal (V) nerve. Work supported in part by NINDB, NIMH, NSF and AFOSR.