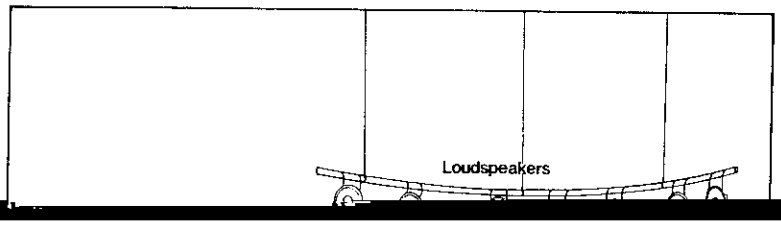
First, the localization ability of three horses was determined by a two-choice procedure with water as a reward (cf. H. Heffner & Masterton, 1980; R. Heffner gave no indication of abnormality (R. Heffner & Heffner, 1983a).

Behavioral apparatus. Testing was conducted on

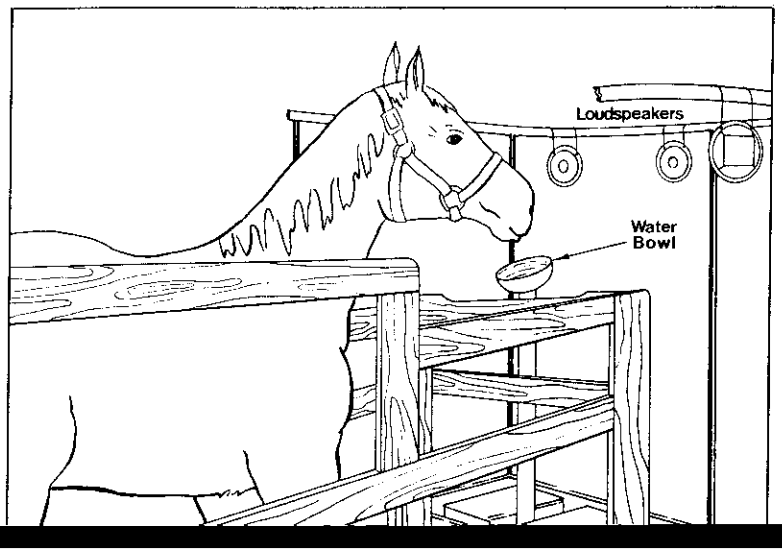

Loudspeakers

aration at which the animal could discriminate between the two stimuli at the .01 one-tailed level of significance (binomial distribution), which was generally 63% correct.

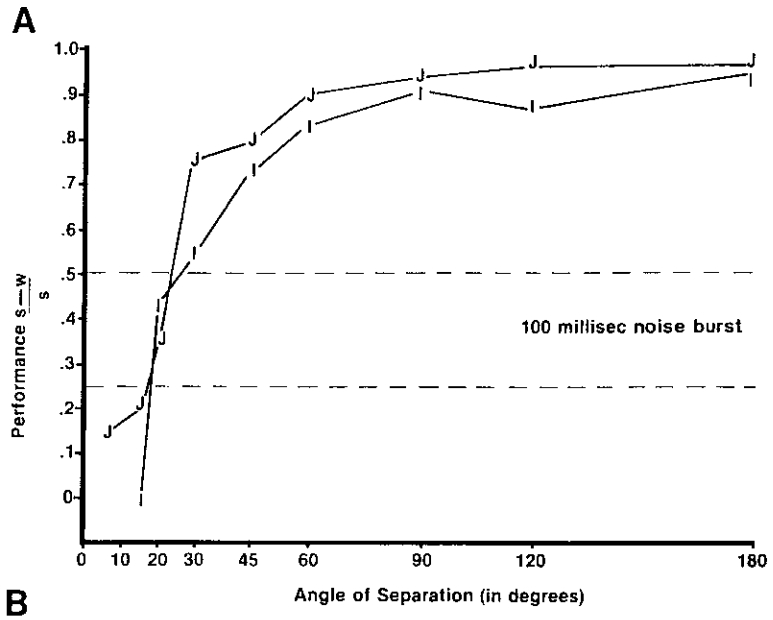
Results and Discussion

Broad-band noise localization. Sound-

2A. Each point represents an animal's asymptotic performance at a particular angle. As can be seen, none of the horses had difficulty with this task at large angles, and at 180° (speakers 90° to the left and right) their scores ranged from 93% to 100% correct. At smaller angles, the animals showed


Loudspeakers
Water
Bowl

or noise burst and then reducing the angular separa- tained asymptotic performance down to 60°


A
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
Performance s—w/s
100 millisec noise burst
0 10 20 30 45 60 90 120 180
Angle of Separation (in degrees)

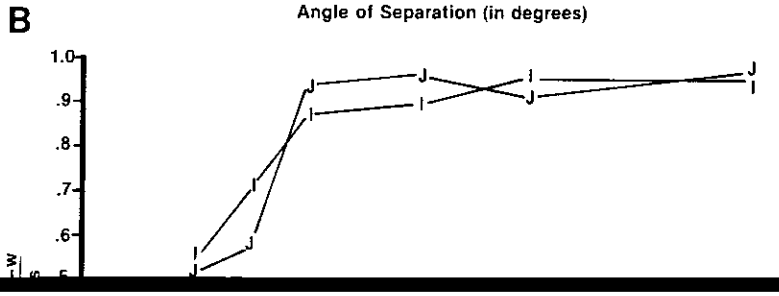

B
1.0
.9
.8
.7
.6
s—w/s

Table 1
Sound-Localization Thresholds

Method

Δfi. An incision just large enough to accommodate the microphone was made in the base of the left pinna of the horse. The microphone was then inserted so that it was directly in front of the opening of the auditory meatus. The loudspeaker was placed on the perimeter bar at 0°, and sound level measurements were made of the broad-band noise at eight different band-pass settings from 125 Hz to 16 kHz in octave

pected from head-size measurements, the horse Δt of 501 μs at 90° was intermediate to the human and cat values.

Close inspection of Figure 5, however, reveals an interesting reversal in the relative sizes of the horse and human Δts. Whereas the human Δt exceeds the horse

consistently larger than a cat's, but it is small angles. However, above 2 kHz, there

Table 2
Sound-Localization Thresholds for 13 Species of Mammals

Animal	Stimulus	Threshold[a]	Source
Human	click	0.8°	Present article (Experiment 1)

[redacted]

mouse, and kangaroo rat. *Journal of the Acoustical Society of America, 68,* 1584–1599.

evolution of human hearing. *Journal of the Acoustical Society of America, 45,* 966–985.