

BIO 45 Lecture II-4 – Orientation, Navigation and Migration

9 October 2002

I. Designing Animals that are good at Getting Around

Many organisms from the simplest to the most complex are able to go places and find things and find their way back. How they do it is a mixture of mystery and discovery

A. The problems

- Why Leave?
- Why come back?
- How to Find the Way?

B. Migration -- Movement between two locations

Daily -- e.g., tidal areas

Yearly -- e.g., toads to and from ponds

Long Distance - e.g., birds, Whales and Salmon

C. Orientation versus Navigation

How is navigation different from orientation?

D. Tools needed:

For orienting

Ability to orient in space

Compass

memory

For navigating - getting back

Map

Path integration

E. Cues that could be used:

Sun

stars

Magnetic Fields

Landmarks

Odors

Directions from someone else

II. How the Animals do it – web site to explore for details

Pigeon Homing

<http://instruct1.cit.cornell.edu/Courses/bionb420.07/eorcutt/PIGEON.HTM>

Monarch Butterflies

<http://MonarchWatch.org/index2.html> See links to biology and migration

Sea Turtles

<http://www.unc.edu/depts/oceanweb/turtles/summary.html>

Honey Bee Dances

<http://www.sciam.com/0694issue/0694kirchner.html>