

Some forty years ago we presented material in this journal concerning the methods that animals use to navigate from one place to another during migration. Recently a leatherback turtle was tracked as it migrated from Indonesia to Oregon to Hawaii--a distance of 12,774 miles in 647 days. The main subject of our discussion in 1968 was the Arctic tern, which travels some 12,000 miles one way as it migrates from the north slope of Alaska to the southern end of South America and back. At that time experiments had suggested a number of built-in navigation devices that allow the terns to make that trip.

Princeton University researchers recently discovered that the use of magnetism is far more sophisticated than anyone would have guessed in 1968 when we first presented this subject. Dr. Martin Wikelski has shown that birds have light-sensitive cells that sense the magnetic lines of force of the earth in their eyes. In 1998 biologists discovered a protein called cryptochrome in the eyes of many animals. This protein reacts to light in a way that depends on the magnetic field in the place where the animal lives. What is especially interesting is that the cells in most birds' eyes are most efficient with the shorter wavelengths of light. In the fall of the year those shorter wavelengths become more abundant and the bird can navigate more effectively. This also may be a clue the birds use to tell when to begin their migratory journey.

Researchers have shown that while some animals use these light-based magnetic detectors, other animals have small magnetic deposits in various parts of their bodies that give another way of sensing the earth's magnetic field. Rainbow trout, for example, have magnetite deposits in their snouts, and pigeons have the same deposits in their beaks. Dr. Bill Cochran has shown that not only do some birds have the visual and magnetic methods of navigation, but they also have ways of setting their magnetic compasses. You can know the direction of the magnetic field of the earth which points north and south, but how do you tell which is which? Cochran has shown that some birds only do their migrating at sunset which tells them that when they face the sunset, south is to their left and north is to their right.

The complexity of this system and the fact that we are only now beginning to understand all of the different ways animals are designed to use magnetism, testifies to the fact that we can know there is a God through the things He has made ([Romans 1:20](#)). As we study birds, whales, fish, bees, monarch butterflies, eels, turtles, and even bacteria we continue to see the evidence of a wonder-working hand that has gone before us.

For additions or corrections to the directory please contact Mike Mendez

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For corrections, suggestions, or to have something included in the bulletins, please contact Ryan or Jennifer Stiltz at 924-0435 or email at stiltz_family@sbcglobal.net

WELCOME

to the
Church of Christ
meeting at Mack Road

This morning's sermon:
The trouble with immorality
Ephesians 5:1-12



Congregational Meeting Times:

Sunday

Morning Bible Study 9:30 am
Worship Service 10:30 am
Evening Service 6:00 pm

Wednesday

Morning Bible Study 10:00 am
Evening Bible Study 7:00 pm

Visitors

The members here would like to offer a special welcome to our visitors today. Please allow us to shake your hand and talk with you, as we take great joy in getting to know you. Visitor cards are available at the pews for you to provide us with a record of your attendance. We appreciate you taking the time to fill these out.

Important dates to remember:

July:

Sun. 26th - Last Sunday of the month song service during pm services

Fellowship Opportunities:

Sun. 19th - **Group 2** meets following evening services

Fri. 24th - Family Night Potluck at the Uptegroves.

Ladies House to House Fellowship

Lesson Book: "Developing Inner Strength, Living in the Joy of God's Love"



Next class: August - TBD. Lesson 6.

If you would like to host a class, please let Jennifer know

Classes

New Converts Class: 2nd and 4th Sundays at 5:00 at the building.

Young Adults Class: Fridays at Caleb's (Steve Sarff's) home. See Caleb for details.

Singing Practice: Monday's at 1:00 pm at the building

Psalm 119:41-48 (NIV)

May your unfailing love come to me, O LORD,
your salvation according to your promise;
then I will answer the one who taunts me,
for I trust in your word.

Do not snatch the word of truth from my mouth,
for I have put my hope in your laws.

I will always obey your law,
for ever and ever.

I will walk about in freedom,
for I have sought out your precepts.

I will speak of your statutes before kings
and will not be put to shame,
for I delight in your commands
because I love them.

I lift up my hands to your commands, which I love,
and I meditate on your decrees.

Birthdays this week:

Jessica McDaniel	July 23
Bill Turner	July 23
Caleb Grimes	July 24