

Wayfinding

Module 9 - Akshayuk Pass Expedition





Wayfinding -

“All of the ways in which people and animals orient themselves in physical space and navigate from place to place.”

LOST ON THE TUNDRA

It is difficult to get lost in the Akshayuk Pass. It is a narrow and steep walled corridor that runs right across the Cumberland Peninsula. For the expedition, each member of the i2P team is equipped with a Global Positioning System (GPS). Add to that the fact that the youth members of the expedition will be wearing satellite beacons that trace their every step and broadcast it back to the i2P website, and it appears that getting lost will be quite difficult. But why do human beings require so much technology to prevent them from getting lost?

Stories of people getting lost abound in the Arctic, and the outcomes are sometimes tragic. i2P science and education coordinator Ewan Affleck has lived in northern Canada for many years and has seen his share of incidents on the land. One in particular stands out. In October of 1993 a colleague with whom he was working in Nunavik (Arctic Quebec) went for a walk on the tundra outside a small Inuit community on the coast of Hudson Bay. For October, it was a relatively warm day – slightly above zero degrees Celsius. At that time of year in the region the nighttime temperatures dip well below freezing. She did not inform anyone she was going for a walk on the tundra, and her absence was not noticed until two days later when she did not appear for work. An extensive search was immediately initiated. She was located five days later, curled up between two rocks ten kilometers from town,

evidently trying to keep warm. At age 43 she had frozen to death, after getting lost on the land. The day she had gone for her walk had been foggy, and the sun was obscured.



Figure 1: The sun seen from Earth (Photo: Lykaestria)

NATURE’S GUIDEPOSTS

The sun and the stars serve as nature’s guideposts – providing to those equipped with the knowledge, a clear indication of di-

rection. But drop someone on a barren tundra on a cloudy day and ask them to walk south and they will almost certainly fail. Ray has experienced significant disorientation in one of the most featureless environments in the world. Describing a whiteout on the barren Antarctic Ice Cap he said, "If you took a cloud, wrapped it around your head and then duct-taped it, that's what a whiteout is like" (see: Ray in Antarctica). If he had not had a compass he would surely have become lost.

TRADITIONAL WAYFINDING

So how did the Inuit find their way on the tundra without compasses or any other modern technology? The ability to successfully navigate on the land to find animals and shelter is at the core of Inuit culture. Without navigation skills animals could not be found, and without animals there would be no food for the family. Consequently the importance of wayfinding has been embedded as a way of life for the Inuit. According to the experimental psychologist Colin Ellard, the Inuit have the capacity to retain a deep mental inventory of landmarks, a skill not required by most cultural groups (see profile below). They also use physical cues, such as an ability to read the hard waves or sastrugi that are etched in the snow by the prevailing wind. Added to a solid understanding of the navigational value of the sun and the stars, Inuit employ refined tracking skills that allow them to read the snow and rock for the passage of previous travelers.



Figure 2: Inukshuk (photo: LT Burwash)

No discussion of Inuit navigation would be complete without acknowledging the Inukshuk. A cultural symbol with many functions, Inukshuks are stone sculptures made to resemble human figures (see the cover photo of this module), which can serve as guideposts for people travelling on the barrens. Frequently the Inuit would leave a chink or a little opening in the rock in the center of an Inukshuk, so that a person peering through this chink would have their eye trained upon the next Inukshuk allowing for forward movement in the correct direction.

But the Inuit had a final and very powerful navigational tool at their disposal that cannot be overlooked: the sled dog. The innate ability of a team of sled dogs to guide a hunter to their home camp - through even the most challenging conditions - is well documented. It is as though the dogs, even in the face of a howling storm that obstructs all visual ref-

erences, have a built in GPS to allow them to find the correct path. Inuit hunters, returning home from the hunt in poor visibility, would entrust the dogs to guide them successfully to their camp.

The historical reliance of the Inuit on the navigation skills of dogs raises a very interesting question. Why is it that human beings seem to have such proclivity for getting lost while many animals appear to be graced with an innate sense of direction?

BETTER INSECT OR ANIMAL OR MAN?

Dogs are not the only animals that seem to have innate navigation skills. Every year many species of birds complete migratory cycles that carry them on journeys thousands of kilometers in length to nest in the same places in the north during the summer, and in the south during the winter. How is it that the Canada Geese, or the Swallows of

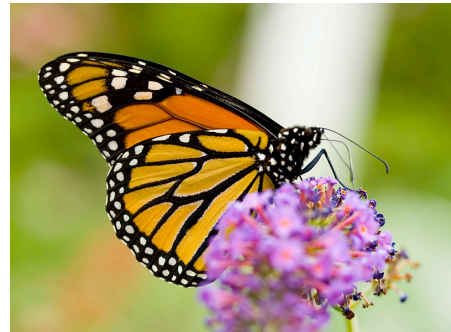


Figure 3: Monarch Butterfly (photo: Ritchie-bits)

Capistrano do not get lost, but unerringly find their way back to the same locations year after year? A

research group out of the University of California suggests that birds use an internal magnetic receptor that requires light to guide them north or south for their migration (see: [swallows](#)).

Even developmentally simpler creatures like monarch butterflies manage to avoid getting lost when traveling huge distances. Monarch

Did You Know?

The most famous example of animal navigation are the swallows of San Juan Capistrano, California that arrive on virtually the same day every year (March 19) after a 10,000 kilometer journey from Goya, Argentina. They depart on or around October 23 for the trip back to Argentina for a total distance of 20,000 kilometers without getting lost or having the aid of a GPS.

butterflies in North America migrate up to 4,500 kilometers on their annual migration, and do not get lost! Incredibly often the duration of the migration is longer than the life span of individual butterflies so the 'sense of direction' needed to complete the journey is passed from one generation to the next.

Similar remarkable examples of navigation ability can be found across the animal and insect kingdoms. In all, about 50 species including mammals, reptiles, amphibians, crustaceans and insects have been shown to use

School Exercise:

If you are able, arm yourself with a compass and take your students to a clear featureless area (e.g. field in the countryside they do not know) near your school or community. Ideally this should be done on a cloudy day. Take them into the center of the field and get them to clearly define what directions are North, South, East and West. Or have a group of students try and establish their proper orientation. It will be instructive what they discover!

the earth's magnetic field to help themselves navigate. Indeed, creatures of all shapes and sizes and complexities seem to have navigation ability that far exceeds that of human beings.

INTERNAL COMPASS

Research from the Universities of Leeds and Princeton, have discovered that bats use a substance found in their cells called magnetite as an 'internal compass' to help them navigate (see: [magnetite](#)). It is

thought that bats use this substance to 'read' the earth's magnetic field thereby enabling them to navigate accurately. In fact magnetite is found in the cells of most animals including humans, but to what degree this substance assists other animals with navigation remains uncertain. If human beings once used magnetite as an internal compass it appears to be an ability we lost long ago.

So, human beings, although graced with a large brain with remarkable powers of deduction when compared to other creatures, are at the bottom of the totem pole with regard to the inborn ability to navigate accurately. We have adapted to this relative inability by developing technologies to assist us with wayfinding. These technologies include the use of Inukshuks employed by the Inuit, to the invention of compasses and the development of Global Positioning System (GPS) technology. A Global Positioning System uses satellite technology to provide accurate information about where someone is located on the earth, information that it appears some animals like birds and

Did You Know?

The monarch butterfly can migrate 4500 km from eastern Canada to their overwintering sites in Mexico. For an animal with a body of about 3 cm, a distance of 4,500 km is about 150,000,000 body lengths for a monarch butterfly. An equivalent feat for a 1.8 m (6 ft) tall person would be 270,000 km. or about 11 times around the earth. Not bad for a bug weighing about half a gram.

Please see: [Monarch](#)

butterflies know intuitively.

PRIMITIVE MAN



It is interesting that the groups of human beings that have retained the most ‘advanced’ natural ability to navigate in the world, have often been characterized as the most ‘primitive’ by ‘civilized western’ standards. The Inuit and the Bedouin (a traditional desert dwelling people from North Africa) are two examples of people that live in wide barren geographies and have had to retain or develop navigation skills that many other people have lost. This leads one to question the validity of our definition of primitive. Who indeed is the most primitive? The Inuit hunter who can navigate his way successfully across a barren stretch of featureless tundra, or the man in a suit carrying a cell-phone who gets lost in the local mall? Perhaps the real answer is that both are primitive, next to more sophisticated creatures like the swallow and the monarch butterfly.



Profile: Colin Ellard – Author and Experimental Psychologist

His Book: “You Are Here; Why We Can Find Our Way to the Moon, but Get Lost in the Mall.” A fascinating investigation of human and animal navigation in which the author suggests that most humans have lost their ability to navigate because their survival no longer depends on it.

Ellard is an experimental psychologist at the University of Waterloo, the director of its Research Laboratory for Immersive Virtual Environments, and an international expert in the psychology of navigation. The results of his research have been published in scientific journals for more than twenty years. Ellard lives in, and regularly gets lost in, Kitchener, Ontario.