



Darwin's finches

Introduction

Although Alfred Wallace should perhaps share the credit for the Theory of Evolution by Natural Selection, Darwin was the one who gathered the evidence needed, made detailed records of personal observations, and finally published the major book which presented his ideas to the scientific community. The book Darwin published about his theory, *On the Origin of Species*, was based partly on observations he made on a five year journey around the world on the ship, HMS *Beagle*. What exactly was the importance of this famous journey? What other science was informing Darwin and opinions at the time? A good scientific theory has to fit in with other ideas of the time. For example, Darwin's theory of evolution fitted well with knowledge and ideas in geology and populations. Later discoveries in genetics served to deepen understanding of the theory. This made it a very strong theory indeed.

(Look at the map of Darwin's voyage on p.138 of the textbook).

The Activity

Part of Darwin's voyage included a visit to the Galapagos Islands in the Pacific Ocean, close to South America. Islands form a very important piece of evidence in Darwin's theory, because they isolate populations from each other.

Read the story below:

A long time ago, a small flock of sparrow-like birds called finches were blown out to sea by a fierce storm. They lost their bearings but flew on in search of the mainland, going further and further out to sea.

At the point of exhaustion, 600 miles from home, they spotted a speck of land - an island in the middle of the sea. They were saved and could rest, drink and feed before returning home. But this island was perfect: it had abundant seeds and other food, plenty of shelter, nesting sites and (amazingly) no predators or other birds to compete with. Life was much harder on the mainland. There was no need for the birds to move on.

Their numbers grew - until they became just a bit too numerous for the little island. Some found it hard to find enough food for themselves or their offspring, and young birds were driven away from areas where food was available. Some birds were forced to fly across the sea to nearby islands. There, they found new territories, also with no predators or other birds to compete with. As the plants and their seeds were just a little different on each island, some birds were better than others at finding and eating the new food sources. Birds which could break open fruits and eat the seeds survived well enough to produce lots of babies. Eventually, after a very long time, all the islands became occupied by these birds but the finches on each island were slightly different.

Scientists believe that this story is just the sort of scenario that happens when new, volcanic islands like the Galapagos are colonised by animals (and plants). It shows how a theory has to include a plausible mechanism to explain events. The questions in this activity are similar to those which a scientist like Darwin would have to deal with when presenting his theory to other (sceptical) scientists.

Answer the following questions about the story using Darwin's theory and discuss your answers with a partner or in a small group.

Discussion questions

1. Explain why it is unlikely that more than one flock of birds would find the islands in this way at the same time.
2. Suggest two possible reasons why there were no predators on the island.
3. Why were there no other birds to compete with? (see Q1)
4. Why might some finches survive better than others on the same food sources?
5. Why were the finches slightly different on each island?