Chapter 5-2: Darwin's Finches

Perhaps the most significant event in the life of Charles Darwin was his appointment as naturalist in 1831 on the British survey ship, the HMS *Beagle*. During his five-year trip on the *Beagle*, Darwin visited Australia, several Pacific Islands, and South America. The ship also stopped at the Galapagos Islands, a remote chain of volcanic islands about six hundred miles off the coast of South America. Darwin recorded much information on plants, animals, rocks, climate, and the native peoples he encountered in his now-famous notebooks. He took particular note of the island's population of birds, especially the finches. The observation of these finches would inspire him to form his theory of descent by modification, which we call evolution. In this plate, we examine the finch population as observed by Darwin, and note how they illustrate the concept of evolution.

The finches in this plate serve as an example of an evolutionary pattern known as adaptive radiation. In this pattern, there is an evolutionary explosion in the number of closely related species from a common ancestor.

Finches are notoriously poor distance fliers, so Darwin was surprised to see thirteen different species of finches on the Galapagos Islands. As noted above, the **Galapagos Islands (A)** lie approximately six hundred miles west of **Ecuador (B)** on the western border of South America. Darwin categorized the different species of finches based on the bird's eating habits and the shapes and sizes of their beaks.

It is postulated that a small number of finches found their way to the Galapagos Islands many thousands of years ago, perhaps rafting over on floating debris. They may have been the first birds on the islands, and with little competition, they multiplied into a large population. As they adapted to changing conditions on the islands, the finches underwent natural selection and developed into different species.

One species of Galapagos finch is the **warblerlike finch (C)**. This bird resembles a warbler very closely, but its eggs, nest, and courtship behavior are more similar to those of finches. The warblerlike finch evolved to resemble a warbler even though it is not of the same species; the absence of competition allowed its evolution. If true warblers had been present on the island, they would have occupied the niche normally held by warblers and this finch probably would not have appeared.

With the warblerlike finch, we introduce the thirteen species of finches seen on the Galapagos Islands and nowhere else. Continue your reading below and notice how different finches have characteristics that vary according to their particular needs.

A second finch observed by Darwin was the **insect-eating finch (D)**. This finch lives in trees and has a heavy beak that allows it to grasp insects. Its body shape is adapted for life in the trees. Notice how its beak and general size compare to that of the warblerlike finch.

Another interesting species observed by Darwin was the **woodpeckerlike finch (E)**. This species has a beak like a woodpecker's (long and narrow) and it uses its beak for drilling holes in wood. However, it has no tongue for removing insects from the wood, and instead uses a cactus spine to dig insects out of the wood. If woodpeckers were present on the island, they would have occupied the niche for this type of animal and this finch would not have appeared.

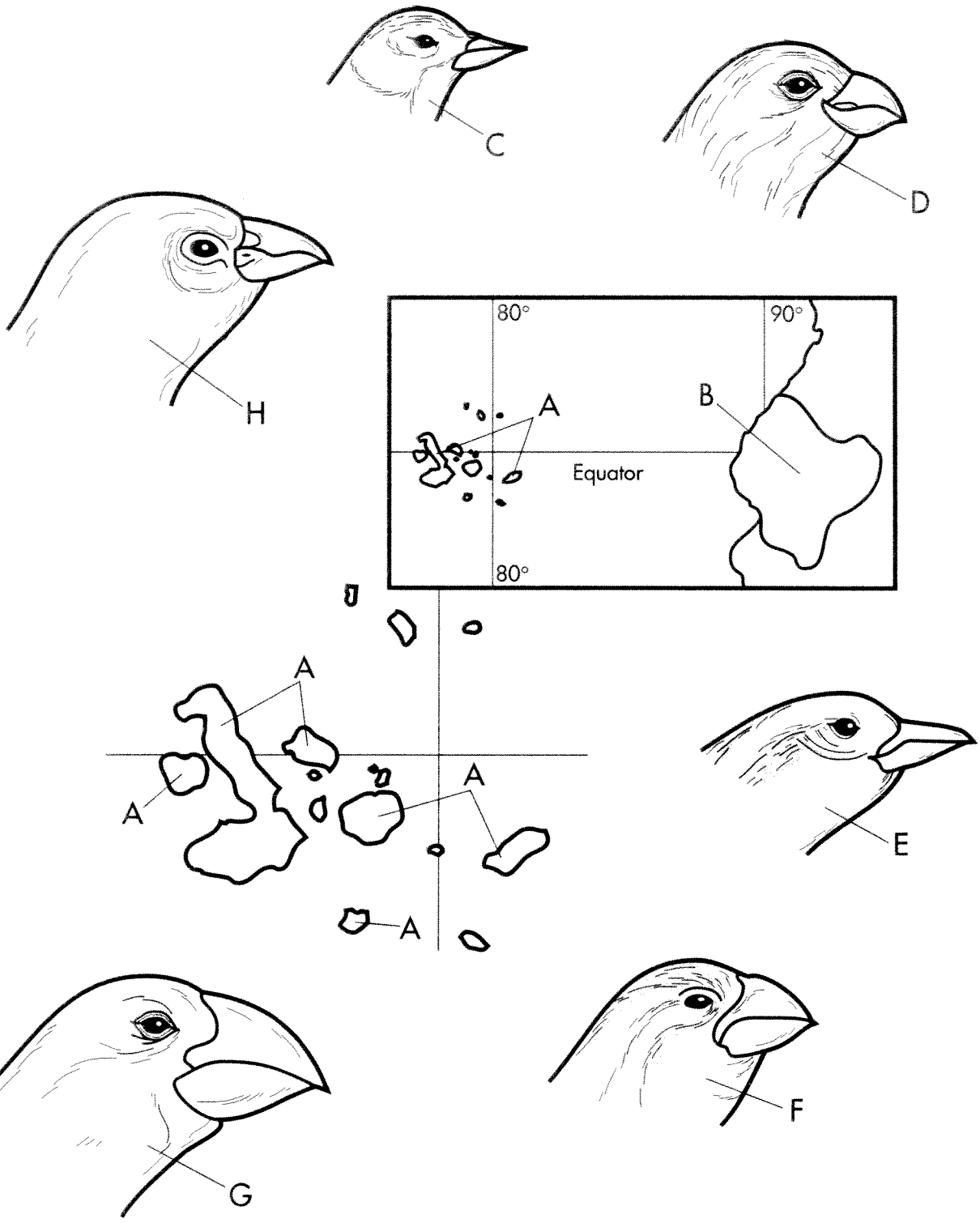
The next finch is the **plant-eating finch (F)**. Again, notice the different shape of the beak. This animal lives in trees and eats only plants. Its beak is designed for grabbing and tearing plants stems and roots.

We have now seen four different types of finches found only in the Galapagos Islands. Differences are apparent in their sizes and beak shapes. We conclude the plate by observing two other finches that live on the islands. Continue your reading below as you color the appropriate pictures.

One of the more interesting finches is called the **ground finch (G)**. This bird has a massive head and beak, as the diagram shows. It feeds on large seeds and nuts and its beak is adapted for crushing their hard shells.

Another finch that feeds on the ground is the **cactus-eating finch (H)**. This bird subsists on cactus seeds. It uses its bill for crushing, but since cactus seeds are relatively soft, its bill is smaller.

The evolution of the thirteen species of finches from a common ancestor is an example of adaptive radiation. In adaptive radiation, different types of species radiate out as they adapt to different environmental conditions. As you'll see in the next plate, another type of adaptive radiation occurred when animals first invaded the land masses of the Earth.



Darwin's Finches

○ Galapagos Islands.....A	○ Insect-eating Finch....D	○ Plant-eating Finch ....F
○ Ecuador.....B	○ Woodpeckerlike Finch ..E	○ Ground Finch .....G
○ Warblerlike Finch.....C		○ Cactus-eating Finch....H