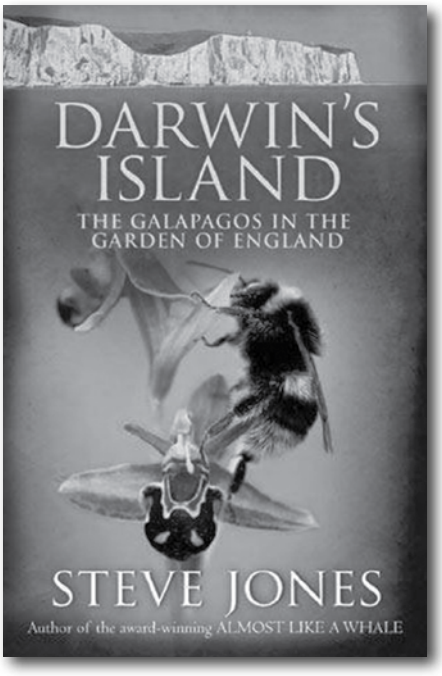
The workings of nature combined with a sprinkling of evolutionary storytelling

A review of
Darwin's Island
by Steve Jones
Little, Brown, London, 2008



John Woodmorappe

Charles Darwin's best known research was based on his travels to the Galápagos Islands. However, most of his observations of nature were conducted in his native England. The title of this book refers to the latter. However, the title of this book is a little misleading, as relatively little of the book's content is about Darwin, what he saw, and how he interpreted it.

The main focus of the book is the way that different plants and animals operate in nature. It is quite non-technical (almost comparable to a newspaper article), which allows those unfamiliar with biological jargon to comprehend freely what is being said. A profuse index allows the reader to look up many specific plants and animals. One shortcoming of the book, however, is a lack of references that would enable the reader to do further study on a given topic.

A few direct evolutionary issues

Throughout this work, evolution itself is treated in a superficial manner, and is occasionally dubbed-in as after-the-fact storytelling. This is essentially an "It exists, it is a solution to a survival challenge facing the organism; therefore it must have evolved" mentality.

A few inferred evolutionary events are mentioned, and treated in a rather superficial manner. This is the case with the origin of the vertebrate eye. Intelligent design is brushed off, but no scenario, let alone proof, is offered as to how an eye that was capable of any form of vision is supposed to have evolved from nothing. Mention also is made of the supposed evolution of the bones in the mammalian ear out of the post-dentary bones in the reptilian jaw. Ignored, however, is the fact that one of the bones conveniently evolves out of existence while the other three supposedly become 'recruited' and modified by evolutionary processes for improved hearing.

Jones acknowledges the fallacy of the Embryological Recapitulation Theory, as he comments:

> "Although the simplistic claim, never made by Darwin, that animals relive their ancient history as they develop from the egg is wrong, the embryo is a reminder of where we came from" (p. 202).

The author fails to mention that even if Darwin did not believe it, many evolutionary biologists did so, even well into the twentieth century, and not a few textbooks continue to imply it.

At times, the author touches on human evolution. He recognizes the fact that all attempts to make primates talk have failed, and that a great gulf remains between humans and non-human primates (pp. 42–43).

Very little of this book engages in the philosophical and spiritual implications of the Darwinian Revolution. The English church is pictured as one that quickly went along with Darwin's ideas. The issue of human uniqueness is presented as one that survived the Revolution in a sense. (Of course, "man as unique"—in the sense of his being the most-inventive of evolved organisms in a meaningless universe—is quite different from "man as unique" in the sense that he is created in the image and likeness of God, and living in a purposeful universe.)

I now present separate chapters on matters of likely interest to the reader.

Malaria and sickle-cell anemia

The author provides a fine tutorial on malaria. As human tropical populations increased, this facilitated the spread of the disease from one person to another. The clearing of tropical woodlands and replacement with mosquito-breeding swamps further aggravated the problem. Malaria remains a major killer today.

A certain mutation causes the red blood cells to be sickle shaped, and with significantly reduced oxygen-carrying capacity. However, this sickle-shaped red blood cell also thwarts the malarial protozoan parasite.

Can the foregoing be considered an example of a beneficial mutation? Imagine a disease which could only infect humans through the soles of the feet, and no other way. Would a mutation that caused leglessness in humans therefore be considered an uphill mutation, even though it might benefit its carrier?

There is more to malaria than the book tells us. Jones fails to mention the fact that the environmentalist-motivated unwarranted banning of the insecticide DDT some decades ago has

facilitated the rebound of malaria and its deadly effects.

Other adaptations for resistance to malaria among humans include a high content of salt and iron in the blood. The author missed the chance to point out that this often causes problems with such things as high blood pressure for those of African descent living in Western countries.

Convergent structures

Usually, the degree of similarity among living things is considered to be directly proportional to the recency of a common evolutionary ancestor. But when similarity occurs between organisms deemed to be only distantly related, this is attributed to convergent evolution. The evolutionary process, in effect, is believed to have hit upon the same solution independently in distantly related lineages.

At times, inferred convergence produces very distinctive results. Jones writes:

> "Anteaters and aardvarks, lions and tigers, moles and mole-rats—all hide a bastard ancestry behind their shared appearance. The process goes further. On Roraima itself, for unknown reasons, melanism is rife among unrelated organisms, and the rocks harbor black lizards, black frogs, and black butterflies. The mutation responsible for black melanin pigment is the same, or almost so, in zebrafish, people, mice, bears, geese, and Arctic skuas (and perhaps even in lizards and frogs), and has been picked up by natural selection in each" (p. 49).

Human racial skin color

In contrast to some humans, the skin of chimps is pale. The differences in skin color between Africans and Europeans are due to a single amino acid that is found in Africans but was replaced by another one among whites. The African version leads to the production of much more skin pigmentation than the alternative.

As noted a few paragraphs ago, the gene which causes dark skin among humans is the same one that causes dark stripes in zebrafish. In fact, the human gene from a dark-skinned human, transplanted into a zebrafish, whose errant gene codes for the wrong, pigment-lacking amino acid, experiences a restoration of the dark stripes.

Interestingly, the Asian peoples have the same dark-skin coding gene as Africans. The light-skinnedness of most Asians owes to a mechanism that is different from that of Europeans.

Carnivorous plants

This book gives an exceptional amount of detail on carnivorous plants, and not only the spectacular ones such as the Venus flytrap (the evolution of which baffled Darwin and still baffles evolutionists today[1]). However, the author is quick to point out that all carnivorous plants have chlorophyll, enabling them to make their own food, just like conventional plants. Interestingly, certain pitcher plants, instead of trapping insects, get supplemental nutrition from dead leaves and bird excrement that has fallen on their pitchers.

Let us focus on some implications of the foregoing. Considering the relative phenotypic malleability of plants relative to animals, it would be interesting to determine experimentally if within-kind variation could transform an excrement-absorbing pitcher plant into an insect-eating one. If so, this could help to explain from a naturalistic viewpoint, how carnivorous plants have arisen since the Fall. This, of course, assumes that the death of insects, which probably have no concept of life and death, and are likely not *nephesh chayyāh* (נֶפֶשׁ חַיָּה = living souls/creatures), and which probably feel no pain, was inconsistent with a "very good" initial Creation.

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Figure 1. The Venus Flytrap has modified leaves that clasp the unwary insect, leading to its digestion by the plant.

Embryology

The author summarizes the history of embryology, including the observations of Charles Darwin. Jones then describes the biology of barnacles, studied by Darwin, and how they foul the bottom of ships and slow them down. Predictably, he infers that the similarities of embryos of different organisms point to a shared common ancestry.

Jones tells the reader how the embryonic tissue gets subdivided into segments and then eventually into distinct organs:

> "As the embryo develops, the chemical signals that promote growth diffuse from its rear end towards the front. They are matched by a second molecular message that travels in the opposite direction and tells the tissue to mature and stop dividing. Each potential somite has an internal timer that instructs genes to work for the appropriate time and then to switch off. When the signal arrives, the clock starts" (p. 203).

Domestication of plants and animals

Jones provides the reader with a history of the domestication of many of the plants and animals we take for granted. As a cat lover, I was disappointed with his omission of cats.

The author focuses on the domestication of maize (corn). As for the apple, he points out that most varieties of wild apples have fruits that are small and tart. However, in Almaty, Kazakhstan, there exists an unusual variety of wild apples in which the apple fruit is large and sweet. The tree itself is much larger than its modern cultivated versions. It was this wild apple which became the progenitor of all the endless varieties of apples we enjoy today.

Jones goes into considerable detail regarding the domestication of a strain of wolf that became the dog. He also focuses on the many kinds of dog breeds found today. Other domestications discussed include the cow, horse, pig and chicken.

The fascinating account of the experimental domestication of the fox, by the Russian Dmitry Belyaev in the 1950s, is related. It teaches us not only how the domestication process makes the animals suitable for human companionship, but also how it alters their fundamental biology.

The experiment began when the fox handlers, who had caught foxes for their valuable fur, had problems with the foxes' fear and aggression. So Belyaev chose the least aggressive male fox out of thirty, and the least aggressive female fox out of ten, and bred them. He then repeated the process. Within just a few generations, the members of the bred lineage were noticeably calmer and friendlier than the usual fox. They even engaged in dog-like behavior such as wagging their tails and barking, and even had floppy ears and piebald coats, and were prone to be sexually active the year around instead of at specified times of the year. After thirty generations, nearly all of the bred foxes were tame.

Sex and deception

Jones elaborates on the many tricks in nature involving sexual reproduction. For example, some plants have parts that lure a mating insect to copulate with them, and get rewarded for their deception by getting pollinated. Many species of birds have monogamous pairings in which at least one of the birds regularly cheats on its mate.

Human sexual foibles are also discussed by Jones, who writes:

> "Casanova, himself of uncertain paternity, posed as a soldier, a doctor, a diplomat, a nobleman and a sorcerer to gain the favors of an admitted hundred and twenty women (plus, more than likely, many more). He was a great lover, and a better liar … His wit, rather than his looks, charmed his way into the bedroom" (p. 233).

The author moves on to contemporary online dating. He seems to contradict his earlier statement about the value of dishonesty when he emphasizes that most online daters are honest, and that deception is not an effective sexual strategy (p. 234).

Introduced plants and animals

The travels of humans all over the globe, especially in recent centuries, have caused the introduction of many forms of life into continents to which they were not native. The introductions have been both accidental and deliberate. This has caused both beneficial and deleterious effects.

As an example, the kudzu plant, a climbing pea native to Japan, was deliberately introduced into the USA for decoration and for the stabilization of soils after forests were cut down. However, the fantastic growth rates of kudzu plants (30 cm per day; 20 m a season) caused them to choke out many other plants.

The author missed a chance to discuss the introduction of rabbits to Australia. Facing no predators, the rabbits multiplied to such an enormous extent that they caused serious damage to the native fauna and flora. Major campaigns had to be undertaken to deal with this pest.

An example of a beneficial introduction has been that of the earthworm to the northwestern parts of North America. Because of the relatively recent glaciation, the earthworm had not yet re-established itself on these territories. Once introduced, however, and owing to the turnover of the soil that it is famous for, a much greater variety of plants (including crop plants) could now be grown there than ever before. On the other hand, native species of life that depended upon a stable soil layer were harmed.

A variety of fascinating facts

The reader of this book can learn a good deal of arcane facts about nature. Did you know, for instance, that the vanilla plant makes vines that are 20 meters long? (p. 221). Or that the herbicide Agent Orange, used by US forces in the Vietnam War, is an artificial auxin that defoliates plants by making them, in effect, grow themselves to death? (p. 176). Or that tractors, used in modern farming, have massive wheels that compact the soil so that it becomes as useless as concrete, and stir up so much soil that local rivers, the world over, have several times more suspended sediment than in the past? (pp. 255–256).

Conclusion

This book is a good one for naturalists. It is very readable. Even though its title is a little misleading, it does offer a fascinating view of nature, albeit filtered through the eyes of an evolutionist. (I am an experienced biologist, and even I have learned a thing or two.)

References

1. Darwin wrote a book about plants that catch insects, *Insectivorous Plants (875),* and called the Venus flytrap "one of the most wonderful in the world". A modern researcher, L. Mahadevan of Harvard, said, "Our study still leaves us baffled about one question that motivated him—how did this mechanism evolve?"; cited in: How a Venus flytrap snaps up its victims, *New Scientist* **185**(2484):17, 2005.