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"Darwin assembled the puzzle of evolution using visual images"



As we come to the close of 2009, Darwin Year, we may think that one of the most emblematic figures in the history of science, this eminent English naturalist, holds few surprises for us anymore. Still, as it joins this celebration, the Centre for the History of Science and the Faculty of Biosciences invited Julia Voss, an expert in Darwin and images related to his theory of evolution, to deliver seminars on this topic, in which she revealed the secrets concealed in Darwin's iconography.

Julia Voss is a researcher in the history of science at the Max Planck Institute and an editor at the *Frankfurter Allgemeine* newspaper. She studied German literature, art history and philosophy. She got her start in the history of science with a project for the Max Planck Institute studying the images related to Darwin. As a result of these studies she published her book *Darwin's Bilder: Ansichten der Evolutions-theorie, 1837-1874* (Darwin's Pictures: Views of Evolutionary Theory, 1837-1874), which won the Otto Hahn gold medal from the Max Planck Society. The book is being published in English by Yale University Press.

- What was the key to the success of Darwinism?

- In the 19th century, the theory of evolution had just been posited and was much less specialised. When Darwin wrote *The Origin of the Species*, he set out to target his discourse to an audience that was not expert in natural history. The first edition sold out immediately

(around 1,500 copies). However, the majority of people did not learn about Darwin's theories from his books (six editions of *The Origin of the Species* were published throughout his lifetime, a total of 20,000 copies) but through the press, articles, reviews or even caricatures that poked fun at the theory. So it was broadly disseminated by media that were quicker and easier to read than a 500-page book.

- But might that not be counterproductive? Wasn't the original concept twisted?

- Of course it was. The media effect was twofold. First, it was beneficial because it enabled the theory to reach a wider audience and more people were aware of and learnt about it, but it also gave rise to many misunderstandings and deformations of the concepts. It was appropriated by a variety of different ideological and political groups to justify colonialism or fascism based on racial superiority, or communism, which waged its "struggle for life" to shake up the foundations of the established system in the belief that there were no privileges, that everything can change... Karl Marx, for example, gave Darwin a dedicated copy of his book *Das Kapital*, which Darwin never even read, as it was discovered that there were still uncut pages in his book. In any case, Darwin never opposed any of the appropriations or uses of his theory.

- Darwin would forevermore be depicted with that long beard that so characterised him, but what did Darwin's beard conceal?

- In the history of science, we have many cases of scientists who are associated with a very specific image, such as Einstein, with his flyaway white hair and his tongue sticking out. The same held true in the 19th century with Darwin. Some photographs from around the 1850s show Darwin clean shaven, but in the early 1860s he let his beard grow because he had developed a kind of allergy, and he decided not to shave it off again in order to hide it. This photograph was very popular throughout the 19th century thanks to scientists' custom of exchanging portraits. It is one of the images that is the most closely tied to the theory of evolution, and you can see it on the covers of books, in exhibitions at natural history museums and in a host of other places.

- He must have thought the beard looked good on him...

- Yes, actually he liked the image it projected. In this way, he was representing a whole set of classical ideals. He was portrayed as a sort of prophet, an ancient philosopher, a venerable gentleman, which somehow helped make his theories more easily accepted as they were surrounded with a certain halo of respectability. In fact, in the last photographs he really looked like a grandfather or even like a man of the cloth, like the one where he is wearing a black coat, which was very handy for reconciling the clash between science and religion that his theory triggered. We could say that he consciously exploited his image as a scientific icon.

- Darwinism itself contains many popular icons, images that no longer only belong to academia, but also form part of popular culture. So how does a scientific image become a popular image?

- Some of his drawings became icons, just like some of the illustrations from his books. I think that the most famous case is the Galápagos finches, which he included in the second edition of his travel diary from 1845. He placed the heads of several different finch species in a layout that suggested the variation from one species to the next. He did not make this

engraving himself, as he had a professional draughtsman for that purpose, but Darwin placed them in this order in order to give this sense of variation among species. And today this drawing of finches is everywhere and is part of popular culture, illustrating how one species can become another or that a species alone can become something different, like an amphibian can become a reptile, a fish an amphibian, a reptile a bird and so on.

This is something you can see not only in natural history museums but in popular culture as well. For example, if you look at The Simpsons on YouTube ([videos](#)) you can see the evolution of Homer Simpson in a kind of evolutionary series through different stages. I think that, by joking about it, all of this has enabled the theory of evolution remain alive among people and has spread knowledge of evolutionary series, despite the fact that we know that species don't change when we see them in nature.

- You have studied of the use of images in Darwin's theory of evolution in depth. Would Darwin agree with the saying, "A picture is worth a thousand words"?

- Darwin used drawings in two ways: first, to present his theory to the public with illustrations from his own books. But we can also find drawings of his made while he was developing his theory of evolution. Therefore, indeed I think he did bear this maxim in mind. Considering the history of evolution, there is something that is invisible to the eye: we can see evidence of it, like variation, extinction, natural selection... but it is like a puzzle that has been taken apart. If we want to understand evolution we have to put these pieces depicted in the drawings together in order to see how it happens. To understand how variation and natural selection interacted, Darwin had to visualise the variation among species, generation after generation, and consider natural selection, which eventually eliminated certain species. All of this is quite confusing when described in a textbook, but if you see it in a drawing you grasp it immediately.

- What kind of images became the most popular?

- His 1872 book *The Expression of Emotions in Man and Animals* was his bestselling book (9,000 copies in the first edition, which was a huge number in the 19th century). It had several illustrations comparing men and animals, and Darwin postulated the existence of feelings in animals, which was thought to be a privilege exclusive to humans. For example, he showed a monkey laughing.

- Were all the illustrations in this book engravings?

- No, he also used photographs. Darwin was one of the pioneers in using photographs printed in books, and he had to finance it himself since his publisher said that it was very expensive and they were not familiar with the technique. The illustrations of humans that he used were photographs, while the animals were depicted with engravings. This was due to the fact that the exposure time in the 1860s (when the book was in preparation) was too long to capture such a fleeting moment as the facial expression on an animal, which furthermore did not stand still for the shot (the exposures were longer than one minute). Therefore, he had to work with professional artists specialised in drawing animals, who were quite successful in the 19th century.

- So what kind of scientific credibility did drawings have in the 19th century?

- In Darwin's day, there was no alternative to drawing for many years, since photography was a nascent field. Engravings were made and then taken to be printed. Later on, photographs were used, but there were many phenomena that could not be photographed, such as the history of evolution, and we have to trust the hand-rendered depictions because evolution is not something we can record with any kind of instrument; it's like a puzzle that we have to put together using fossil evidence, but we can't see it with photographs. The way Darwin portrayed this puzzle through images and representations was aimed at developing a discourse, a common thread of his theory.

Darwin was certainly not a skilful drawer, and if he had to make a naturalistic drawing of some animal he actually did it quite poorly. But he was good at representing more abstract ideas, such as his diagrams on evolution; they were not portraits of an object he had before him but the representation of a theory, of an idea. We have to distinguish between realistic drawings of objects we can see and the representation of abstract ideas like Darwin's theory of evolution.

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