

BOOKS & ARTS

In Retrospect: Lamarck's treatise at 200

Fifty years before *On the Origin of Species*, a confusing, tiresome and prescient book laid the foundations of modern evolutionary theory, write **Dan Graur**, **Manolo Gouy** and **David Wool**.

**Philosophie Zoologique
(Zoological Philosophy)**

by Jean Baptiste Lamarck

First published by the author: 1809.

Vol. I 428 pp; Vol. II 475 pp.

Translated by Hugh Elliot (Macmillan: 1914).

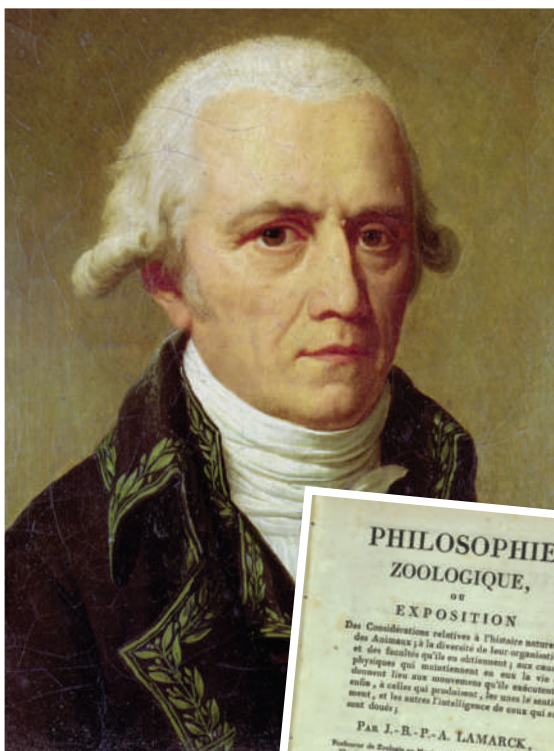
Vol. I translated by Ian Johnston: 1999

(<http://tinyurl.com/philozoo>)

On 14 August 1809, Jean Baptiste Lamarck presented the two volumes of his most important book, *Philosophie Zoologique*, to France's Institut National des Sciences et Arts. Twenty years later, he died penniless, blind and scorned, surrounded by hundreds of unsold copies of his book. He was buried in a rented plot, exhumed and 'dispersed' five years later. Today, someone else occupies the grave of the man who founded the field of invertebrate zoology, coined the word biology and proposed the first scientific theory of evolution. His *Philosophie Zoologique* hasn't fared much better. It was mocked, ignored, belittled and purposely misunderstood for many years, remaining untranslated into English for 105 years. It took just 77 years, by contrast, to translate Charles Darwin's *On the Origin of Species* into Ukrainian.

But within the maddening, confusing and repetitive pages of Lamarck's exposition lurk concepts that are central to modern evolutionary thought. Stated in contemporary terminology, they include the ideas that species change through evolutionary time; that evolutionary change is slow and imperceptible; that evolution occurs through adaptation to the environment; that it generally progresses from the simple to the complex, although in a few cases it proceeds in reverse; and that species are related to one another by common descent. Furthermore, Lamarck incorporated into his theory the fact that the world is old, and proposed that the evolutionary process started with abiogenesis — the origin of life from inanimate matter.

So how and why has Lamarckism become a shorthand for foolishness? Lamarck's scientific reputation became tarnished soon after his death. In the 1830s, Georges Cuvier, Lamarck's fiercest opponent, published a 'eulogy' in French and English describing Lamarck's system as something that "cannot for a moment bear the scrutiny of anyone who has dissected



Ambiguous translation may have added to misconceptions about Jean Baptiste Lamarck's evolutionary opus (inset).

a hand, a viscus [visceral organ], or even a feather". In the second half of the nineteenth century, Darwin perpetuated the claim that his theory owed nothing to Lamarck's "nonsense". Later, Lamarck's name was damaged further by its association with Trofim Lysenko's quack genetics in the Stalinist Soviet Union. Recently, Lamarck has been invoked once more, again wrongly in our view, in the field of epigenetics — the study of phenotypic and gene-expression changes that occur without a change in the genetic material.

Lamarck did have a few fans. One was the great geologist and Darwin's friend Charles Lyell, who in his youth "devoured Lamarck" and late in life admitted having been unjust towards the French naturalist. Lyell felt that Darwin merely modified Lamarck's theory of evolution to coin his own, an attribution that greatly upset Darwin: "You often allude

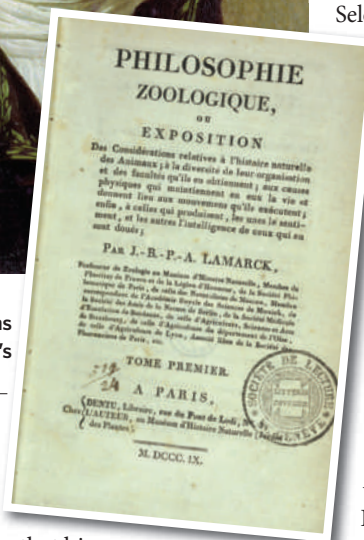
to Lamarck's work ... it appeared to me extremely poor. I got not a fact or idea from it."

Another notable champion of Lamarck was the German biologist Ernst Haeckel. He recognized the injustice in attributing all aspects of evolutionary theory to Darwin, and in 1902 suggested: "The portion of the Theory of Evolution (*Entwicklungstheorie*), which maintains the common descent of all species of animals and plants from the simplest common original forms might ... with full justice, be called Lamarckism. On the other hand, the Theory of Selection, or Breeding, might justly be called Darwinism."

Recognition of Lamarck's contribution is hindered by two persistent misconceptions. First, people wrongly assume that he believed in the direct induction of advantageous hereditary changes by the environment. Yet he writes repeatedly against this notion: "For, whatever the environment may do, it does not work any direct modification whatever in the shape and organization of animals." The second misconception concerns volition. A popular caricature of Lamarckism depicts an animal, usually a giraffe, wishing to reach

the upper branches of trees, and acquiring a long neck through will alone. This error may have originated from the mistranslation of the French '*besoin*' — meaning 'need' — into the ambiguous term 'want', which can mean both 'desire' and 'need'. This poor choice by the 1914 translator was probably influenced by Cuvier's use of the word "*désir*" in his damning eulogy.

Of course, Lamarck did err. He believed in the inheritance of acquired characters (as did Darwin); adhered to the principle of plentitude — according to which any conceivable organism that can exist does exist; violently opposed Antoine Lavoisier and modern chemistry; and believed that science has a deistic purpose — similar to the accommodationism of modern biologists such as Ken Miller and Francis



Collins. In fact, the amount of scientific rubbish that Lamarck put on paper certainly exceeds the quantity of good science in his scientific oeuvre. In this respect, he is no different from Aristotle, Isaac Newton, Darwin, Albert Einstein, Fred Hoyle or Francis Crick. But by writing about evolution directly rather than *en passant* (as did dozens of philosophers from Empedocles to Count Buffon), and by tackling the subject of evolution in scientific

rather than poetical terms (as did Erasmus Darwin), Lamarck is without doubt the father of evolutionary theory.

In this year bracketed by two celebrations of Darwin — the 200th anniversary of his birth on 12 February and the sesquicentennial of the publication of his masterpiece on 24 November — let us pause on 14 August to ponder the man whose biological insight preceded *On the Origin of Species* by 50 years. ■

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A passion for birds

Life List: A Woman's Quest for the World's Most Amazing Birds

by Olivia Gentile

Bloomsbury USA: 2009. 352 pp. \$26, £25

If you had less than one year left to live, how would you spend your days? After being diagnosed with terminal cancer, Phoebe Snetsinger, the subject of Olivia Gentile's first book, invested her time trying to see every bird species in the world. In the process, this American grandmother became the first person ever to see 8,000 species of birds. *Life List* is her story.

Birdwatching is typically dismissed as a quiet hobby pursued by eccentrics, but it can be more like an extreme sport. Most birders keep a record of all the species they've spotted — their 'Life List' — and its size is a source of prestige. Intense competition results. It is a pastime often dominated by middle-aged men who seek out globe-trotting, cliff-dangling adventures, punctuated by bouts of dysentery and malaria, to fulfil their quest to see the rarest birds in the world.

Birders share attributes with many scientists who may not know where the line between passion and obsession lies. But obsession requires extreme sacrifices.

Phoebe didn't start out noticing birds. In her youth, she was a tomboy who distinguished herself as a gifted student with a natural affinity for writing, languages and the sciences. But in the 1950s, young women's futures were limited, so Phoebe followed the expected path: marriage and children. But dedication to her family did not relieve the boredom, frustration and intellectual starvation that accompanied suburban life. Depression set in.

One sunny day, a neighbour took Phoebe into the back yard, put a pair of binoculars into her hands and pointed to a small bird

perched in a treetop. From the moment she set eyes upon the blazing orange throat of that Blackburnian Warbler (*Dendroica fusca*), she was hooked. She purchased binoculars, studied field guides and went out birding with her neighbour several times a week. Her remarkable memory and enthusiasm overcame her innate shyness, so she quickly befriended other birders. Birdwatching became Phoebe's freedom from the cage of domesticity.

As her skills improved, Phoebe began travelling farther to see birds. But everything changed in 1981, just a few months short of her fiftieth birthday, when she was diagnosed with a malignant melanoma. She was

given less than one year to live. At roughly the same time, she received an inheritance from the estate of her father, multimillionaire Leo Burnett, who had died ten years previously. With the blessings of her husband and children, Phoebe used her inheritance to pursue her passion. She set out to see more birds than anyone else had ever done before.

Despite her diagnosis, Phoebe did not die from cancer. She spent the next 18 years pursuing birds into exotic places, through war-torn lands, despite several injuries and the death of a birding companion. She persisted even after being assaulted in New Guinea. But her decision to pursue birds meant sacrifices elsewhere. It often took her away from family events: Phoebe missed weddings, funerals and christenings. Eventually her marriage was at stake.

All this ended abruptly in Madagascar in 1999: Phoebe was killed when the van she was travelling in overturned. She had just seen a rare species of vanga, a stunning bird that had only recently been described.

Life List is riveting and, like its subject, demonstrates a passion bordering on obsession. The index is extensive and there are detailed chapter notes, citing interviews with Phoebe's family and friends, referencing scientific papers, magazine articles and books, including Phoebe's personal memoir, *Birding on Borrowed Time* (American Birding Association, 2003).

Yet the story of a suburban housewife and mother-of-four who became a legend in the testosterone-driven world of competitive birding is more than a biography. It raises themes that echo through all our lives, from the restriction of people's roles by society, to questions of how best to spend one's days on Earth. Is pursuing a rare bird a trivial pursuit, or a chase worthy of respect? Ultimately, *Life List* asks what it means to live, and die, well. ■

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Phoebe Snetsinger logged more than 8,000 bird species.