I'd love to tell Darwin he was right all along

Was the evolution theorist just a beetle-collector who got lucky? No, says Armand Leroi. He was an icon whose discoveries echo through every branch of 21st-century science

t's hard to see Charles Darwin. Not that there's a dearth of stuff around. Turn on the television and you will see David Attenborough, Richard Dawkins or perhaps even me expounding his greatness. You can gaze at his birds in the Natural History Museum in London, as well as his notebooks — or at least facsimiles of them. You can have your fill of Darwin at a hundred lectures given at universities and schools across the country. Send for the poster, buy the mug (I have), browse the supplement; if, by July, you're not fed up with all things Darwinian, then you haven't been paying attention.

Yet for all that, it is hard to see Darwin. For he is no longer a man. He is an idea, a symbol, a battle cry. He is the power of reason against irrationality; progress against reaction; the light of science cutting through the gloom of religion. When he was buried at Westminster Abbey he became an icon of the materialist, secular age. And, like many a saint, he has grown vast in his afterlife. Einstein is as 20th-century as a Warhol print; but Darwin? He is an icon for the 2lst.

Every evolutionary biologist worth his salt has fantasised about having Darwin as a colleague. You're at Down House, trying to think thoughts worthy of the hallowed ground upon which you tread, when he shuffles into view: the cloak, the stick, the beard, the hooded brows. What do you say to him? "You have won," would be a good place to start. "In the 21st century, the theory of evolution by natural selection—your theory—reigns as the only rational explanation for organic design. To be sure,

theory of evolution by natural selection—your theory—reigns as the only rational explanation for organic design. To be sure, others have tried: mutationists, Lamarckians, creative evolutionists, complexity theorists—every generation has produced its pretender. But the crown is still yours and

we, your men, are legion."

Darwin's big idea was no

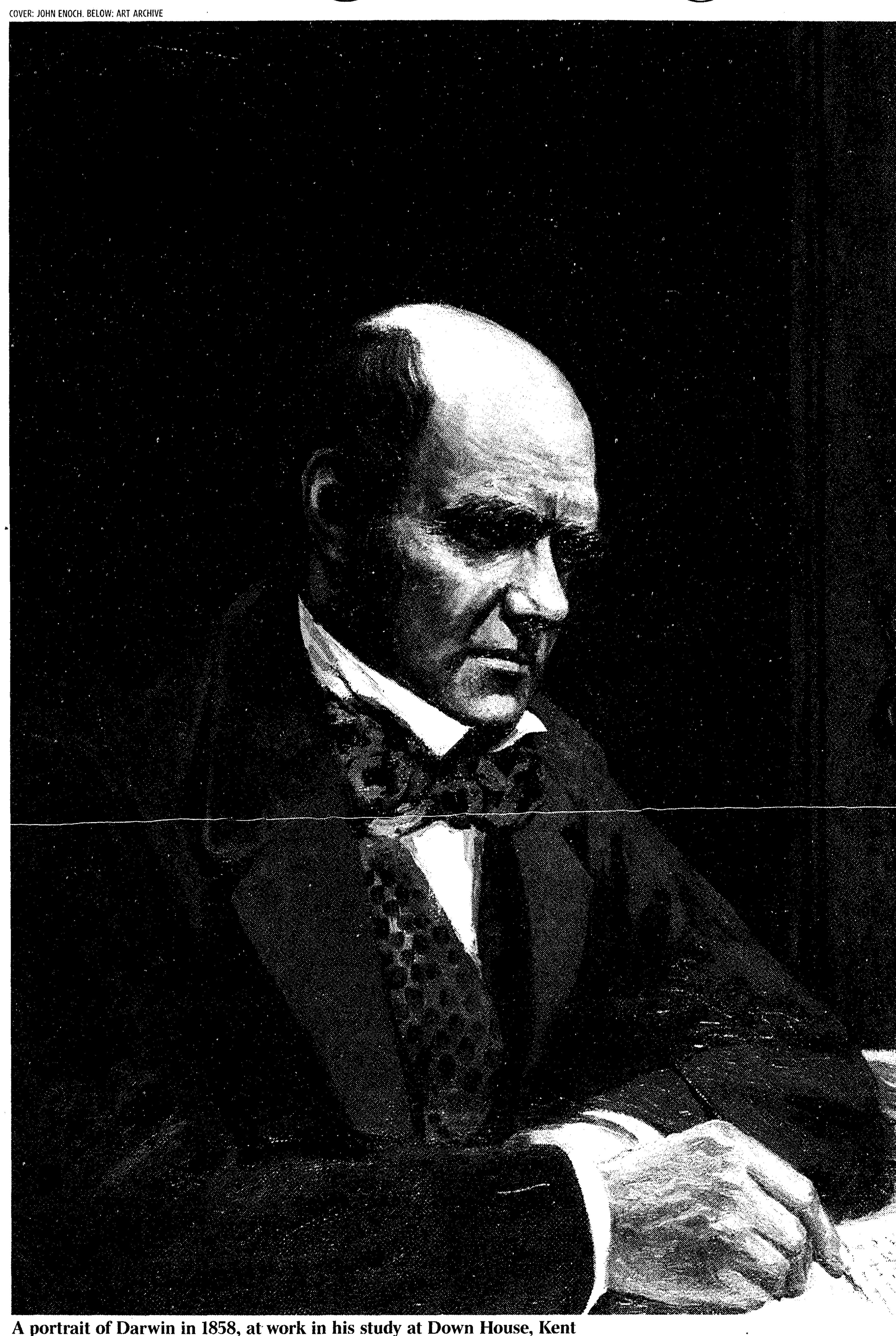
Darwin's big idea was natural selection, which provided a mechanism for species to change through time, to adapt to their environment. Take two birds, one with a long

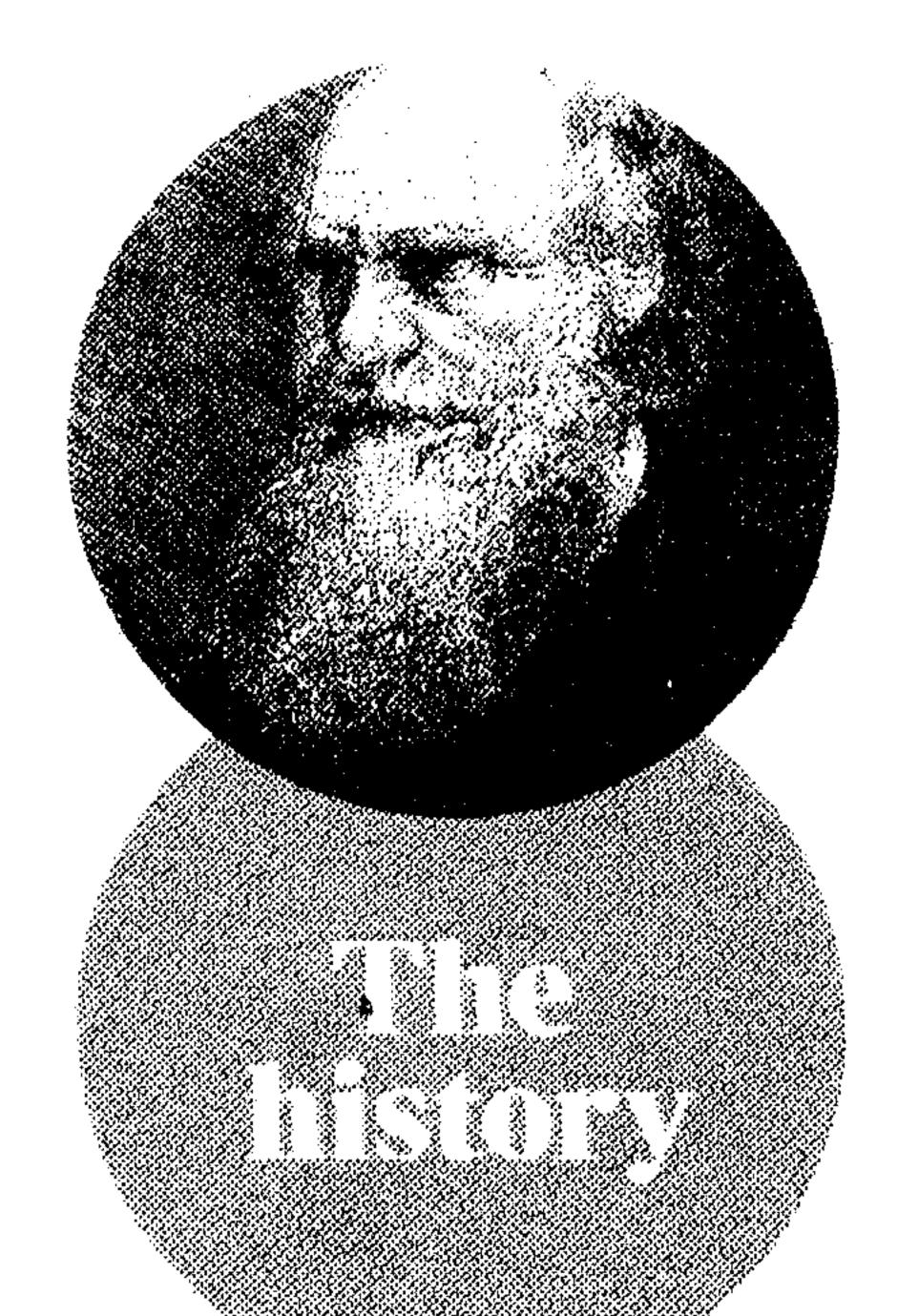
beak and one with a short beak. Assume that the difference is inherited. If a long beak assists in the finding of food, those with long beaks are more likely to reproduce, and their long-beaked progeny to reproduce. Short-beaked competitors will starve and eventually die out. Particular species colonise particular environmental niches; in this way, Nature selects the winners and losers in the game of life.

When we look at much of science today, we find that Darwin got there first. It's all there in embryonic form in On the Origin of Biogeography, palaeontology, evolutionary-developmental genetics, biology, ecology, sociobiology: every chapter, occasionally every page, is now a discipline in its own right. Darwin would marvel, though, at how mathematical the theory of evolution has become—he struggled with maths at Cambridge. The geologist in him would grasp instantly how plate tectonics tumbles the continents across the face of the globe, and how this explains why New Zealand has a frog. The palaeontologist would marvel at the exquisite microscopic fossils that Chinese researchers have been harvesting from Guizhou. They prove what he always supposed, that animals must have swarmed in the pre-Cambrian seas, long before they were preserved in English rocks. The proto-bird Archaeopteryx he knew about. But he didn't know about the fossilised whales-with-legs that now link humpbacks to hippopotamuses. And he certainly didn't know about Sahelanthropus, Australopithecus, Homo habilis, erectus, heidelbergensis—the whole panoply of hominid fossils that show, in irrefutable detail, the descent of Man from apes. He might, though, retort: "Found them in Africa, you say? Just where I said they would be."

Darwin didn't get everything right: he didn't guess that genes are the units of inheritance. But he would grasp instantly how DNA can be used to unravel the history of life. He would understand how his 1837 sketch of a tree (with that infinitely moving "I think" scrawled next to it), which in his hands was a mere metaphor to explain the descent of species from a common ancestor, has become, in ours, a reality. It is a vast map of the organic world, in which every living thing has its place, providing the narrative spine of the greatest story every told: the story of life itself.

Perhaps my deepest pleasure would come from telling him how natural selection, far from being the weak and invisible force that he thought it was, is often strong and manifest in the natural world. Because he is, above all, a naturalist, I would tell him about just one wonderful, new part of the living world: the cichlid fishes of Lake Malawi. Four million years ago a fish entered the lake that Livingstone called Nyassa,





1809

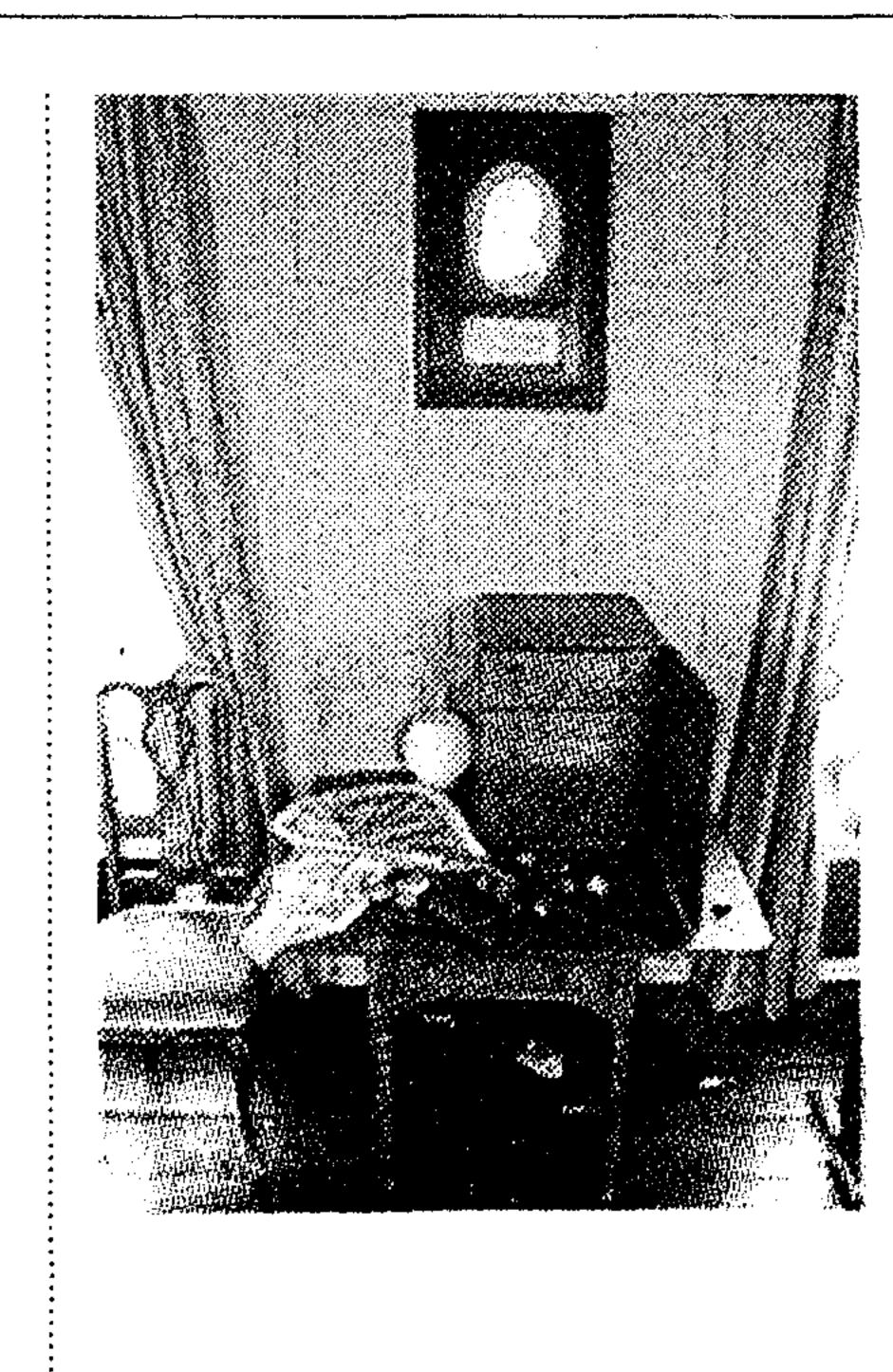
Darwin born in Shropshire into Wedgwood-Darwin dynasty. Famous grandfathers — Erasmus Darwin and Josiah Wedgwood

Studies medicine at Edinburgh University but hates surgery 1826

Joins nature society at Edinburgh University and is taught taxidermy by a freed black slave, John Edmonstone

1827 Quits medicine

1828
Moves to Cambridge to study for the Church



1831

God

Joins Beagle voyage, during which he conceives the idea of natural selection by looking at finches

1836 Returns home

Debuts as a naturalist, making his first presentation to the Royal Geological Society. Begins to doubt the creation of species by

1839

Marries Emma
Wedgwood, a first cousin
and devout Christian

1840

Ill-health sets in, turning Darwin into a recluse

1842 Moves

Moves to Down House, Kent, paying £2,200 for it, and makes first private notes on transmutation of species 1858

Alfred Russel Wallace writes from Malay Archipelago to say that he has discovered natural selection. Panicked, Darwin co-publishes, with Wallace, the first account of natural selection

1950

On the Origin of Species published, in which the word "evolution" does not appear