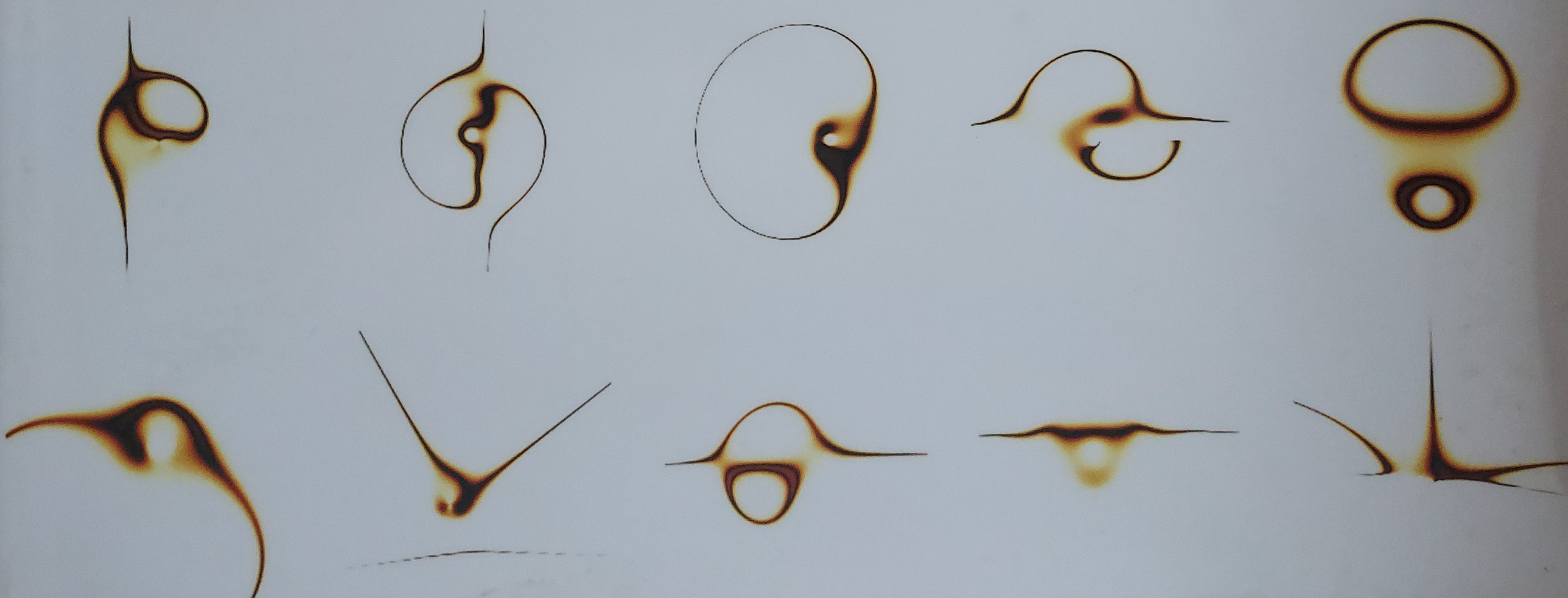


The Evolutionary Review | art, science, culture

VOLUME 1



Commemorating Charles Darwin

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This past year the world threw the great English naturalist and geologist, Charles Darwin, a party: international commemorations, on an unprecedented scale to mark the 200th anniversary of his birth. Yet this is not the first Darwin anniversary to be marked with exceptional attention. Near the end of his life, Darwin was perhaps the most famous living man of science in the world. He was widely regarded as the leader of a revolution in the understanding of life on earth. It was a revolution most people felt had happened in the twenty years after the 1859 publication of the *Origin of Species*. Evolution was accepted as a fact by the international scientific community. Although Darwin was the subject of hundreds of obituaries around the world when he died in 1882, the first anniversary to be celebrated came twenty-seven years later in 1909.

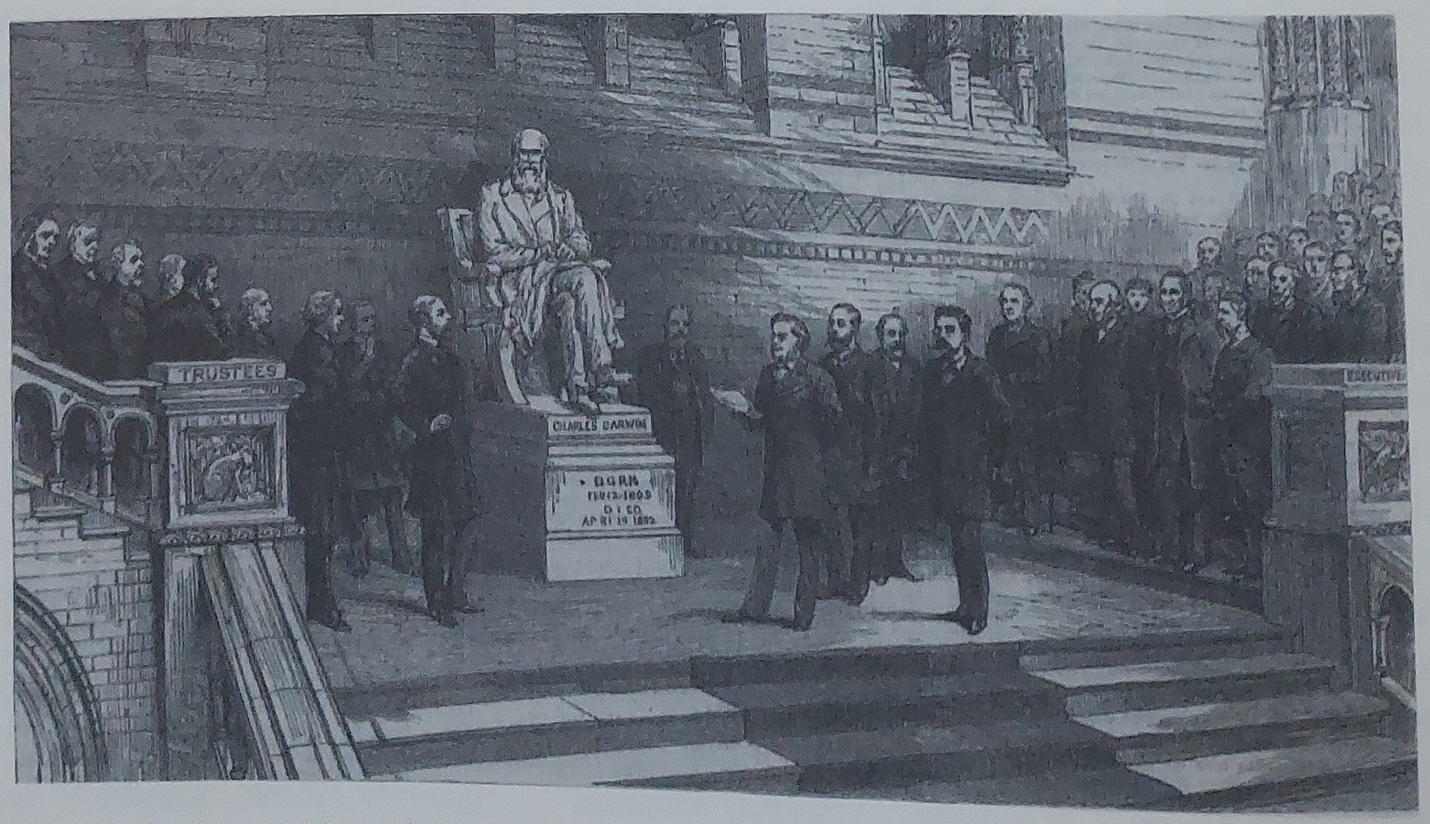


Figure 1. Anon. Unveiling the statue of the late Charles Darwin in the Natural History Museum, South Kensington. *The Graphic*, 20 June 1885, 621–22.

In June 1909, more than four hundred scientists and dignitaries from 167 different countries gathered at the University of Cambridge to celebrate the centenary of Darwin's birth and the fiftieth anniversary of the publication of his famous work *On the Origin of Species*. The event was an unprecedented success. Never before had such a celebration been held, not for an institution or a nation, but for an individual scientist. An historic exhibition of Darwiniana was held in the downstairs room of the Old Library at Christ's College. It included portraits, busts, notebooks, manuscripts, letters and objects used on the *Beagle* voyage. The exhibition catalogue listed 257 items (Shipley and Simpson). Many distinguished visitors from around the world came to see the exhibition and signed their names in a book now kept in the Old Library at Christ's College.

The Darwin centenary in 1909 was, by all counts, unprecedented (Richmond). And in the present, one can truly say the same thing again. Yet furthermore, the number and extent of the events and publications connected with Darwin in 2009 utterly dwarfed those of 1909, and indeed all previous anniversaries combined.

Exhibitions on Darwin in 2009 included the largest ever, the traveling Darwin exhibition that began at the American Museum of Natural History in New York. The exhibition "Endless forms: Charles Darwin, Natural Science and the Visual Arts," explored the influences of Darwin on the arts, and opened at the Yale Center for British Art. Other smaller but no less outstanding exhibitions included the permanent new exhibition "Charles Darwin and Evolution" at the Natural History Museum of Denmark, Copenhagen or "Darwin and Dinosaurs" at the Rocky Mountain Dinosaur Resource Center, Woodland Park, Colorado which boasted the finest collection of Darwin's works I have seen on display anywhere. Many museums refurbished their displays, such as Darwin's former home, Down House. Darwin's college, Christ's College, Cambridge, restored Darwin's old rooms and opened them to the public for the first time since 1909. (They were open throughout 2009.) Many special educational programs also were initiated on the occasion of the Darwin bicentenary, using Darwin and his experimental work as a tool to teach science in schools in the United Kingdom.

In 2009, the publications scheduled to appear on Darwin were simply beyond count. Numerous new scholarly works on Darwin appeared, as well as books in the fields of science, philosophy, religion, fiction, science fiction, children's books, and at least three collections of poetry. Probably hundreds if not thousands of articles appeared in newspapers and magazines. Many journals published special issues, these ranged from *History of Science* to *The Lancet* and across fields as diverse as archeology, music, and biodiversity.

Commemorative objects ranged from the usual T-shirts and mugs to playing cards, a Danish Darwin calendar, and a tea towel. Commemorative Darwin stamps were issued by the United Kingdom, Bulgaria, Portugal, Italy, Gibraltar, the Cocos (Keeling) Islands, and Uruguay. A new commemorative £2 coin joined the existing portrait of Darwin on the UK £10 note.

A staggering array of TV documentaries, films, radio broadcasts, podcasts, plays, and musical performances also appeared. A new life-size bronze sculpture of Darwin was unveiled at Christ's College, Cambridge and a wax statue, also of a young Darwin, at the Calouste Gulbenkian Foundation, Lisbon.

Tourist trips to visit Darwin-related sites were organized in England, Scotland, South America, Galapagos, South Africa, and Australia. Commemorative events were held in Argentina, Australia, Brazil, Canada, the Cape Verde Islands, Chile, Columbia, Denmark, Ecuador, Egypt, France, Germany, Israel, Italy, Mexico, New Zealand, Peru, Portugal, Russia, Singapore, Slovenia, Spain, Switzerland, Turkey, the United Kingdom, and the United States. And no doubt there were many others. The *Origin of Species* celebrations continued throughout the end of 2009!

As the director of *Darwin Online* (http://darwin-online.org.uk/), I enjoyed a unique perspective on the unfolding phenomenon of Darwin commemorations in 2009. Before the year began and for the first several months of 2009 *Darwin Online* was inundated with requests from publishers, broadcasters, exhibition organizers, and journalists for high-resolution images from his works. The origins of these requests from countries worldwide was striking. There was a national website, Darwin200, already recording

Darwin events in the United Kingdom. But with all of these international requests for images and assistance coming in, it occurred to me that a web page might be set up to record Darwin events worldwide. I began a "Darwin 2009 Commemorations" page on *Darwin Online* which listed several hundred events, publications, films, documentaries, and performances occurring in the bicentenary year of 2009. Although very far from complete, it is perhaps the largest list of worldwide events yet published. (This page was visited more than 50,000 times in 2009.)

Additionally, there was a need for lecturers on Darwin to speak due to the numerous events scheduled. No doubt everyone who worked on Darwin must have been inundated with requests. In 2009, I gave about thirty-five public lectures on Darwin at locations all over the world. Because of the distance involved, I arranged my U.S. invitations into a three-week lecture tour that was an adventure in itself. I landed in Boston and spoke there, as well Ohio, Illinois, Colorado, Wisconsin, Oklahoma, California, and Maine. Everywhere I traveled I was treated with incredible kindness and generosity. Asked from time to time who had organized the tour, I responded that it was not intelligently designed, it just evolved from a number of unrelated invitations. After so many public lectures I was somewhat disappointed that I was never challenged by creationists, something I expected to find in the United States, where I had not been in almost ten years. In fact, I was rather looking forward to creationist challenges since I have a collection of arguments other than the usual ones that circulate in such discussions. But, alas, creationists seemed either not to turn up to lectures on the life of Charles Darwin or they asked no questions.

During my tour I tried to talk to as many "real" people as possible, that is, away from the universities and museums that had invited me. A bartender at my hotel in Cleveland asked me what I was doing there. I said I was there to give a lecture on Charles Darwin. There was an awkward moment of silence, which was broken when the bartender asked, "Is he the one known for the big bang?" As an experiment, I gave an explanation of what Darwin had achieved without using the word evolution. A self-professed Christian, the bartender was a remarkably independent thinker. Presented with the story in a nonconfrontational way, he seemed quite happy to accept all the essentials of the history of life as now understood by science.

A shuttle driver in Baltimore asked me what I did. I answered "I am a historian, I work on Charles Darwin." To which the reply was, "Charles Darwin? Who was that?" I mentioned evolution. "Oh, is that concerned with theological issues?" To this I gave a neutral response. The driver replied, "Oh I thought so. Was he against religion? People around here . . . education is bad here so that Darwin is just not on their radar. People know how to pronounce the name, the word that is. It is not discussed by African Americans around here at all. Names that are discussed are Luther and Calvin."

It also was possible for me to find "real" people in the United Kingdom who had not heard of Darwin. A few years ago I had an addition put on my house. The builder asked me what I did. "I'm an historian," I answered. The builder looked puzzled, "I didn't know you could make a living doing that." "Well, you barely can," I answered. He asked what I worked on specifically. "Charles Darwin." The builder gave me a blank look for a moment. "Who was he?" I could not believe he was serious. "Who do you think is on the back of the ten pound note?" I asked producing one from my wallet. He read out the name as if he had never heard it before, "Oh, yes, it says right here, Charles . . . Darwin." I insisted that surely he had heard of Darwin before. No, he maintained, never. He then asked the electrician, working on the other side of the room, if he had heard of Charles Darwin. "I recognize the name but that's all." On the other hand, I shared a taxi to an airport near Cincinnati with a woman who asked what I did. "Darwin!?" she asked excitedly. "Darwinism is my religion!"

So why all this activity related to Charles Darwin in 2009? Several theories tend to crop up in conversation, for instance, the continuing "controversy" over evolution, particularly but no longer exclusively in the United States, or a need for a scientific hero. But surely any explanation that does not take account of the whole picture cannot be right. We need to consider how Darwin has been regarded and commemorated since his own time. The amazing fact is that what one saw in 1882, in 1909, and subsequent anniversaries since, such as those in 1935, 1959, and 1982,

is an unparalleled respect and admiration for this figure. And from different people in different countries, speaking different languages, from different contexts with different motives, axes to grind, and so on. Such international, cross-cultural and long-enduring fame and respect needs some kind of explanation.

I suspect that part of the explanation for all of this sustained Darwin admiration is based on what he actually did—which is astonishing to say the least—rather than on short-term local agendas. That is my preferred view, but then I am not only a historian of Darwin but an amateur naturalist, and I am profoundly impressed with his explanation of life, which allows one to understand so much more of what one sees in nature.

Yet my theory is probably not sufficient either. When reading, viewing, or listening to most of the materials written or made about Darwin, one is struck by an astonishingly superficial or inaccurate view of what he actually said or did. Which presents an odd paradox. Darwin is one of the most famous scientists in history and clearly one of the most influential thinkers and writers of modern times, yet most people either do not know what he really said and did, or have it wrong.

WHAT DID DARWIN DO?

Darwin made so many scientific discoveries, innovations, and contributions that no complete list of them has ever been published, and indeed such a list would be difficult for most people to understand because his contributions were highly specialized and cut across so many fields that no one today is an expert in all of them. The best place to get even a passing impression of this is to scroll down the publications page on *Darwin Online* [darwin-online.org.uk], which lists his complete publications.

Darwin's main contributions can be divided among geology and palaeontology, evolution, and botany. His early geological work during the voyage of the *Beagle* was largely geological and saw him advance from a collector and describer to an ambitious theorist. He discussed in detail the origin of metamorphic rocks by deformation and clarified the distinction between cleavage and sedimentary bedding (different ways that rocks split or divide): two fundamental contributions to geology. He demonstrated a widespread connection between elevation of the land and nearby volcanic activity. By recognizing that the shells in beds as high as 1,300 feet above the sea in the Andes were species still living in the nearby sea and indeed in similar proportions to current biodiversity, he was able to prove that the elevation was relatively recent.

He discovered a petrified forest at Agua de la Zorra, in modern Argentina, and was able to show that the movements of the land were so gradual that the trunks of what were once coastal trees remained nearly vertical after being pushed up high into the mountains. Darwin showed that the conditions necessary for fossils to form, where coastal sediment was deposited near land masses, only exists at any given time in certain areas and for certain periods in the history of the earth and that, therefore, the fossil record must be extremely fragmentary. (This was before he became an evolutionist.) Darwin discovered several species of extinct fossil mammals in South America, and he discovered that the horse lived and went extinct in pre-Colombian America.

His theory of the formation of coral atolls is now known to be correct—namely that large areas of the Pacific Ocean bed are subsiding and that coral reefs growing around subsiding volcanic islands keep up with the subsidence until the islands are completely submerged thereby leaving characteristic ring-shaped atolls.

Darwin's last book, published the year before his death, was on earthworms. In many ways, it was a very Darwinian work. Like so many of the others, it was published decades after he first began speculating on the subject. And he once again discovered that small and apparently trivial natural processes, ever present but unnoticed beneath our feet, completely change and shape the surface of the land. Darwin showed that the actions of worms were of great value to the soil by fertilizing it, aerating it with their burrows, which also allowed the soil to absorb more water and facilitated the growth of the roots of plants. Through careful measurements and experiments Darwin could show that "all the vegetable mould over the whole country has passed many times through, and will again pass many times through, the intestinal canals of worms." Earlier writers who

had underestimated the ability of worms were criticized for their "inability to sum up the effects of a continually recurrent cause, which has often retarded the progress of science, as formerly in the case of geology, and more recently in that of the principle of evolution."

Darwin showed that the reason ancient ruins and artifacts are found underground is because they are undermined and buried by worms. Worms push up small piles of castings from their burrows. These, in effect, constantly push up the surface of the land via all the pieces small enough to pass through a worm. Darwin calculated this mass was as much as eight tons per acre a year. Larger objects thus slowly sink into a sea of ever-rising worm soil. Darwin measured this with many experiments including stones at Stonehenge and "a large flat stone" in his garden—now known as the worm stone.

Darwin is now so famously associated with natural selection that evolution itself, what Darwin called "descent with modification" is comparatively overlooked. It was after all Darwin's greatest achievement—to convince the skeptical international scientific community that life on earth is not a series of disconnected independent creations but a unified family tree of genealogical descent with slow modification. As if this were not enough he also discovered sexual selection and a version of kin selection to explain the evolution of sterile social insects such as ants and bees.

He showed that the we ourselves are descended from earlier forms, and that every fact about our anatomy, the chemical make up of our bodies, the detail of our gestures, expressions and emotions, all derived from earlier organisms. He also pioneered the study of evolutionary child psychological development.

Beginning in the 1860s, Darwin increasingly devoted himself to botany. His book on orchids (*Various Contrivances*) demonstrated that plants showed just as astonishing evidence of adaptations as animals. He showed that wind-pollinated flowers are not brightly colored, whereas those pollinated by insects have bright colors and sweet smells. He discovered a completely new method of reproduction in plants, heterostyly. He discovered that insectivorous plants (*Insectivorous Plants*) digest their prey with chemicals similar to those used by animals and that this adaptation allowed these plants to compensate for the lack of nitrogen in the boggy soils where they grow. He demonstrated the evolutionary benefits of crossing (rather than self-pollination). He found that the "climbing" of plants is a result of the process of nutation. The tip of the plant's stem bends to one side while it grows and the plane of the bend revolves, clockwise or counterclockwise, so that the tip slowly makes circular sweeping movements. Before the invention of time-lapse photography, Darwin invented brilliant techniques for capturing these unobservable moments on paper.

This is a small but hopefully representative sample of Darwin's discoveries. His contemporaries knew these better than their posterity. Nowadays Darwin is remembered for an increasingly narrow set of achievements.

One other thing one sees in the Darwin celebrations is the perpetuation or rather dissemination of myths and legends. Earlier anniversaries disseminated the myth that Darwin discovered evolution while in the Galapagos Islands when he observed the beaks of the finches. Frank Sulloway refuted this view in 1982. More recent works continue to repeat the discredited theories that Darwin withheld his theory of evolution for twenty years because he was afraid (van Wyhe "Mind the Gap"). Also still repeated is the tiresome myth (for which there is no evidence) that Darwin stole ideas from Alfred Russel Wallace.

CONCLUSION

So what next? There seem to be two theories in circulation: that people will be "Darwined out" after 2009 so that no one will want to hear or read about him again, or alternatively, that Darwin will be more popular than ever. The former seems to me to have by far the largest number of advocates. Judging from previous anniversaries—each of which produced a spike of publications on Darwin—a long trailing off of publications on and interest in Darwin will follow before we return to a pre-2009 level of publication. Indeed after the phenomenal promotion of Darwin that has occurred in 2009 one might expect his fame and reputation to continue to increase in coming years.

The 2009 Darwin commemorations, in all their multifarious international forms, are unprecedented in history

to celebrate a single scientist. The sheer vastness of human activity engendered in this year in response to Darwin renders it undeniable that he remains one of the most important and influential thinkers who ever lived. An anonymous writer describing the garden party held at Christ's College, Cambridge in 1909, with its guests from all around the world in their brightly colored gowns, wrote a fitting epitaph for the 1909 celebrations, an epitaph that could have served almost as well for the celebrations of 2009:

> It was indeed interesting at the time to reflect, while looking upon this richly arrayed throng, that the past energies of one great life had occasioned these general rejoicings, symbolising as they did the honour to the personality of the great naturalist himself and the expectation of greater things to come by the continuance of his labours. (anon 8)

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