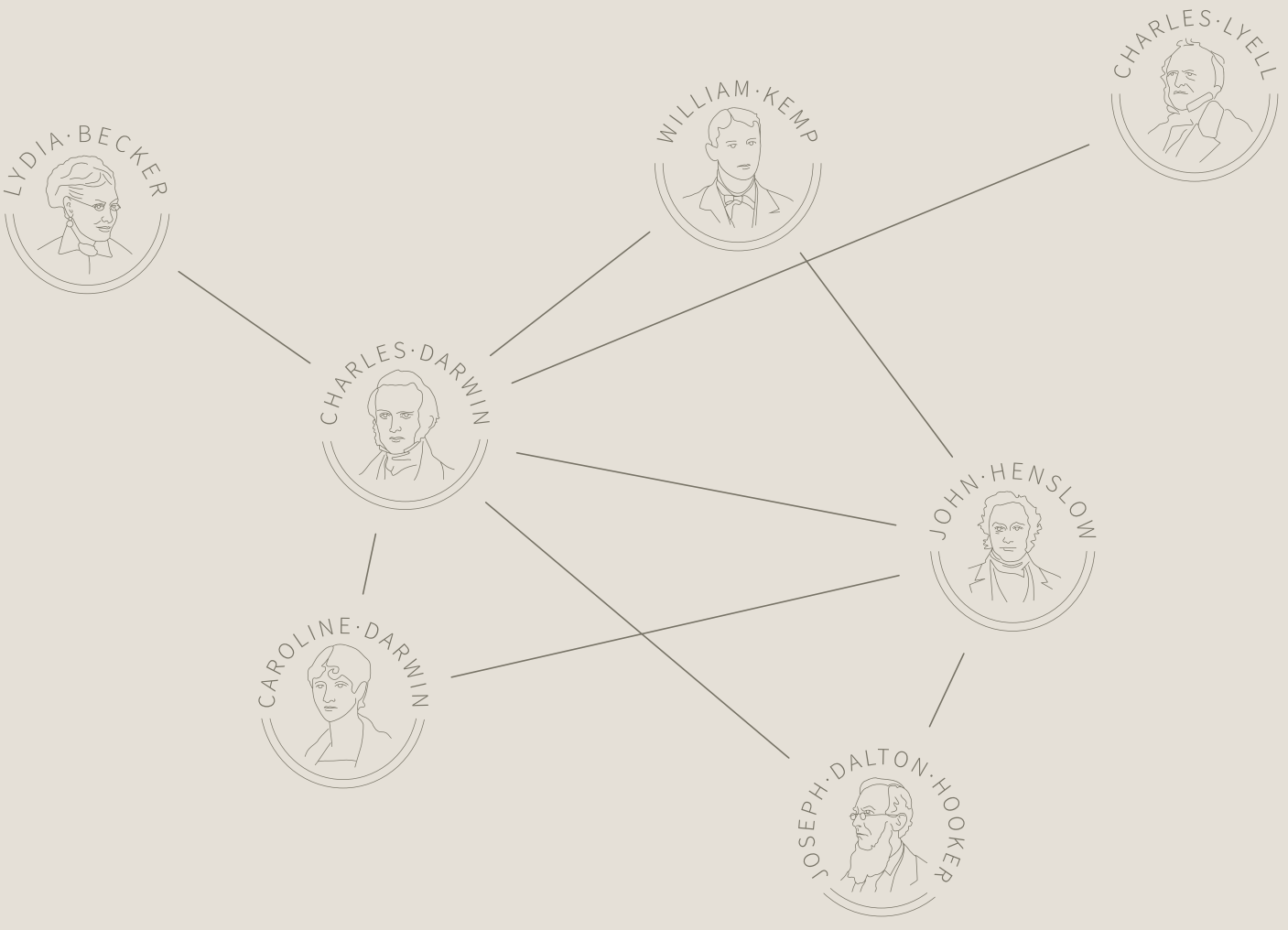
Exhibition Guide

Darwin conversation

THE ENDLESSLY CURIOUS LIFE AND LETTERS OF CHARLES DARWIN



…a letter is something living

(CHARLES DARWIN TO ASA GRAY, 22 JANUARY [1862])

Charles Darwin (1809–82), author of *On the Origin of Species*, is one of the most famous names in science. His explanation for how all living things evolved from a single shared ancestor continues to be widely read and debated. Through his letters, anyone can meet the man behind those ideas, and explore the full story of how they were developed.

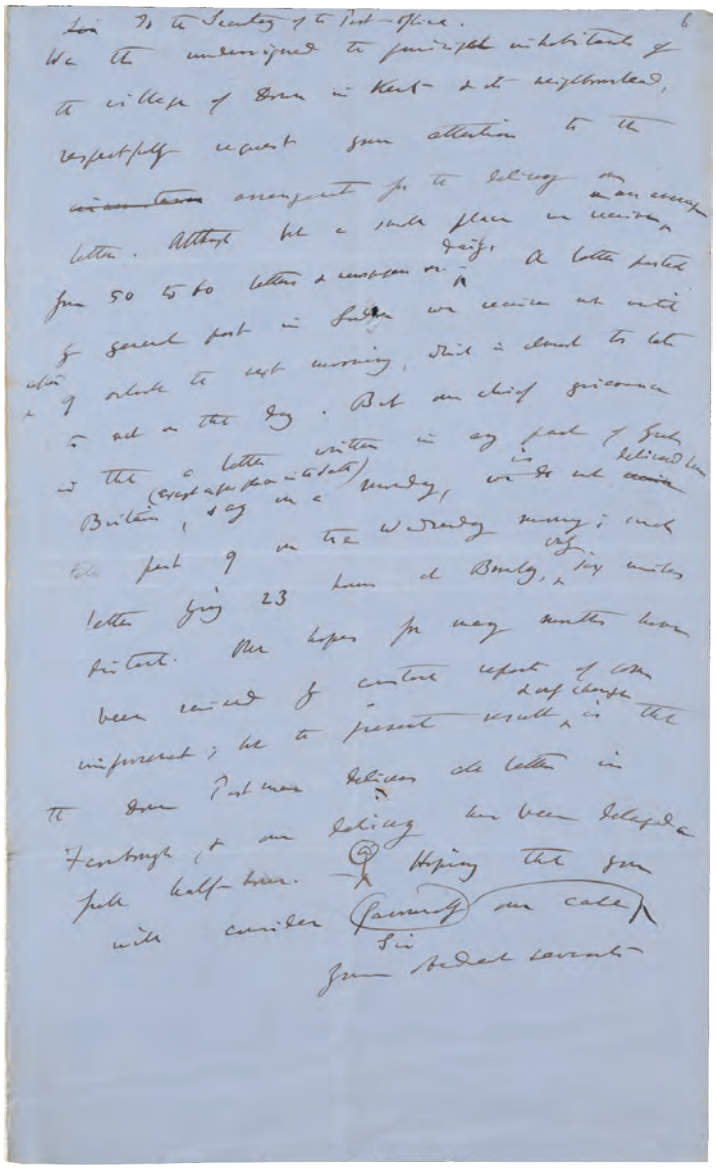
The letters are often unexpectedly warm, witty, and engaging. Whether encountered as a raw young adventurer, a family man, or a grey-bearded celebrity, Darwin had an infectious curiosity about the world around him.

The letters mix science and gossip. Darwin counted many scientific correspondents as friends even if he never met them, and his social networks overlapped with the scientific world. His global network of correspondents included women and men from all walks of life, from working-class pigeon-breeders to aristocratic orchid-collectors. The letters are a window onto their lives too.

This year sees the completion of the thirty-volume print edition of *The Correspondence of Charles Darwin* and the online publication of all known letters he wrote and received.

We the undersigned the principal inhabitants of the village of Down in Kent & its neighbourhood, respectfully request your attention to the arrangement for the delivery our letters. Although but a small place we receive an average from 50 to 60 letters & newspapers &c. daily.— A letter posted by general post in London we receive not until after 9 oclock the next morning, which is almost too late to act on that day. But our chief grievance is that a letter written in any part of Great Britain (except a few places in the South), say on a Monday, is not delivered here till past 9 on the Wednesday morning; such letters lying 23 hours at Bromley, only six miles distant. Our hopes for many months have been raised by constant reports of some improvement; but the present result & only change is that the Down Postman delivers all letters in Farnborough, & our delivery has been delayed a full half-hour.— By a change granted us a few years ago, our letters leave this place at one oclock, by which means they get to London in time to be sent out by the general post of the same day, & are delivered within London on that night; we most earnestly pray that this arrangement may not be disturbed. Hoping that you will consider our case favourably | Sir |

Your obedient servants



From the principal inhabitants of Down to the secretary of the Post Office. Draft by Charles Darwin. [1845–51?]

Darwin the letter writer

Letters were integral to Darwin's working day. He spent an hour reading them in the morning and another hour replying in the afternoon. He wrote as many as ten letters a day and may have received many more.

Letters brought ideas, observations, and even specimens from around the world. Darwin used letters as a research tool, posting off lists of questions and pleas for help. He asked his correspondents to pass on his queries to their own contacts. He wrote in the margins of incoming letters, cut them up, and interleaved them with his research notes.

He often went back to the same letter, marking up passages in separate colours as he worked on different subjects. The overlapping conversations that run through the letters were sparked by the books he read and shaped the books he wrote. Discussions often went backwards and forwards across several letters, sometimes for years.

Darwin as an Early Adopter

Darwin was always curious about new technology, whether it was making adaptations to his microscope, inventing ways to record movement in plants, testing the uses of photography, trying out new pens, or buying one of the very first typewriters.

He saw quill pens and sealing wax replaced by fountain pens, envelopes and postage stamps. He exploited faster and cheaper communication to grow his networks of correspondents around the world.

Case 1

Nine months' letters are wandering over the wide ocean …

The letters that kept Darwin in touch with family and friends during the *Beagle* voyage could take months to arrive. Darwin would continue adding to a letter until the *Beagle* encountered a ship going in the right direction to deliver it. The last hurried note on this letter is in pencil as ink would take too long to dry.

Darwin used a Bramah pen holder like this one during the *Beagle* voyage. It was particularly good for travellers. It had a levered clasp to hold a quill nib (called a 'pen'), which meant several nibs could be cut from a single feather.

1 **Letter to Caroline Darwin, 18 July 1836**
DAR 223: 35

2 **Bramah pen holder and quill nib, silver and bone. Early 19th century**
Private collection

It wasn't only letters that came through the post. Specimens of plants and creatures were sent to Darwin from all over the world. Butterfly wings from Brazil illustrated mimicry; seeds stuck to a bird's foot were proof that plant species could spread across oceans; Argus pheasant feathers from southeast Asia prompted ideas on the evolution of ornament, and variously coloured kidney beans were used in experiments on cross-breeding.

3 **Dwarf kidney-beans and paper wrapper, enclosed with letter from Henry Coe, 18 September 1858**
DAR 142: 20

10 **Butterfly wings enclosed with letter from Fritz Müller, 14 June 1871. Facsimile of DAR 142: 58**

11 **Argus pheasant feathers, from John Gould, n.d. and envelope annotated by Darwin DAR 142: 48**

Joseph Dalton Hooker

What a splendid, magnificent letter from Asa Gray! I should out of pure vanity rather like to keep first sheet, so do not throw it away.

(to Joseph Hooker, [22 January 1860])

Joseph Hooker and Asa Gray were Darwin's most important correspondents. Through his work at Kew Gardens, Hooker gave Darwin access to international networks of gardeners, plant collectors, and colonial officials. He introduced Darwin to Gray, Harvard professor of botany, in 1851. Gray, a devout Presbyterian, popularised Darwin's theories in North America.

Letters were often passed around friends and colleagues. We only have the first sheet of this one, with Gray's enthusiastic response to *Origin*, so Hooker evidently did as Darwin asked and saved it for him.

4 **Letter from Asa Gray to Joseph Hooker, 5 January 1860**
DAR 98: B20–1

The Botanists present their best thanks to Mr Darwin for his kindness in advancing them in their pursuit … — The learned Linguists feel also grateful for Mr Darwin's generous assistance.— Ki te kahore hoki he mahi.

The six Horner sisters were part of Darwin's social circle in London immediately after the *Beagle* voyage and remained friends and occasional correspondents. They and their husbands became part of the inner circle who knew about Darwin's species work before *Origin* was published. One sister was a botanist, one a linguist, another was both. A fourth sister was an expert on shells who translated a Swedish work on barnacles for Darwin.

The tone of the letter is teasing: the Maori phrase 'Ki te kahore hoki he mahi' translates roughly as 'If you have nothing better to do'.

5 **Letter and envelope from the Misses Horner,**
[17 March 1837 – 28 December 1838]
DAR 94: 1a

Darwin spent considerable sums of money on stationery and postage. From 1840 postage was charged by weight and these scales were used by the Darwin household to estimate the cost of sending letters.

6 **Postal scales and weights used at Down House. Copper alloy and mahogany. English Heritage, Down House**

Darwin sent William Thiselton-Dyer, assistant director of Kew Gardens and Hooker's son-in-law, this self-addressed pre-paid postcard with a request to identify a leaf. Thiselton-Dyer returned a one-line answer: 'Caladium esculentum' (a synonym of *Colocasia esculenta*, coco yam or taro).

After pre-paid postcards were introduced in 1870 Darwin used them for quick questions and replies, often received the same day from local correspondents - rather like instant messaging today.

7 **Postcard from William Thiselton-Dyer, 27 June 1878**
DAR 209.14: 188

In a 2d. Edit. I might say from several discussions & correspondence with H.W. I have modified my views.

Darwin often revised his publications as a result of correspondence. He altered a passage about shame and remorse in *Descent of Man* following several letters with his cousin, Hensleigh Wedgwood, about the origin of these seemingly uniquely human emotions. Darwin asked for the return of one letter to 'serve for a memorandum', kept drafts of others, and made copious notes.

For most of his life Darwin wrote with a steel-nibbed dip pen. Some of his family liked Mitchell's 'J' nibs though he preferred Perry & Co No. 3 fine points. He switched to blue ink around 1880, possibly after adopting one of the new fountain pens.

8 **Draft letter to Hensleigh Wedgwood, 9 March 1871 and associated notes**
DAR 88: 66/67

9 **William Mitchell's Pens 'J' nibs with box, and Perry & Co. no. 3 fine point nibs**
Private collection

YOU MUST HAVE GUESSED BY THIS TIME THAT FATHER HAS GOT A 'TYPEWRITER' & A VERY NICE TOY IT IS.

Second letter from Horace Darwin to George Darwin, 1 May 1876)

Darwin was easily persuaded to buy one of the new Sholes and Glidden typewriting machines – later marketed as the Remington No. 1 – after reading an article in *The Times*. It cost him £21.

He quickly abandoned it, probably because it wasn't any faster than writing or dictating, and it only produced upper-case letters. He gave it away to a German zoologist, Carl Semper, who used it to write him a thank-you letter.

12 **Second letter from Horace Darwin to George Darwin, 1 May 1876. Typed**
DAR 258: 860

Replaced from October with first letter from Horace Darwin to George Darwin,
1 May 1876. Typed DAR 258: 859

My dear little wife, who understands and loves you, having presented me yesterday with a pretty boy, I have taken the liberty to give him your illustrious name …
Hamburg, on Charles Darwin's 70th Birthday.

Darwin got fan mail from all over the world. He was probably more pleased that this working-class German couple had read his books and believed in his ideas, than by the birthday wishes or the naming of their baby. Darwin Richard Beger was born on 11 February 1877, the day before Darwin's 68th (not 70th) birthday.

13 **Postcard from Karl Beger, [12 February 1877], Hamburg**
DAR 201: 3

Postcard from Karl Beger, [12 February 1877], Hamburg
DAR 201: 3

Wall Box

I shd. like a Society formed so that everyone might receive pleasant letters & never answer them.

(to Thomas Huxley, 22 October [1872])

Darwin got so many letters that his family had this form letter printed to save him the bother of replying to them all. Darwin never used it. He sometimes complained of 'heaps of foolish letters' but generally wrote or dictated at least a short, hand-written reply.

Printed form letter, 1860s - 1870s
DAR 133.1: 1

Case 2

Where do we find the letters?

This is one of the more unusual sources. We don't know when this printer's block was made or why, but this is the only known version of the letter. Darwin may have written it in reply to a letter telling him about a dog who got a servant to open the door by ringing a bell.

The single largest collection of Darwin letters is in Cambridge University Library, which has around 9,000, but there are letters in hundreds of other collections around the world.

Many letters are privately owned. Darwin's descendants and the descendants of his correspondents have been generous in donating letters or making them available. Some letters are known only through copies made for Darwin's son Francis, who published a selected edition after Darwin's death. Others are known only from printed sources. Letters are still coming to light and will continue to be added to the online edition.

Printer's block of letter to [W. H. Scott?], 16 November [1875?], wood and metal, early 20th century, and print 2022
MS Add 10409

1

Printer's block of letter to [W. H. Scott?], 16 November [1875?], wood and metal, early 20th century, and print 2022
MS Add 10409

Darwin's is just one voice in a vast web of conversations that helped propel scientific discovery during his lifetime. In the 1840s, long before he became famous, Darwin was one of several scientific men exchanging letters with William Kemp, manager of a gas company in Galashiels. Kemp kept Darwin's letters – about the germination of what were thought to be fossil seeds – bound together with others, including some from Darwin's Cambridge professors, Adam Sedgwick and John Henslow, and the author and evolutionist Robert Chambers. Before these letters came to light, we could only reconstruct the story from Kemp's letters to Darwin. Kemp's descendants donated the other half of the correspondence to the University Library, and thanks to their generosity we can fully understand Kemp and Darwin's discussion.

2 **William Kemp's bound letters collection.**
Original front board with repro text block
MS Add 102523.

3 **Letter to William Kemp from Thomas Walker, 15 February 1844**
MS Add 10252/33

4 **Letter from Darwin to William Kemp, 1 November [1843]**
MS Add 10252/18

DAR 162: 201

The letter, you see eternalized before us, is your letter.

(from Nicolaas Doedes, 27 March 1873)

These Dutch students were so pleased to get a letter from Darwin that they sent him a photograph of themselves holding it.

Photograph of Jan Costerus and Nicolaas Doedes, March 1873
DAR 162: 201

We the undersigned the principal inhabitants of the village of Down in Kent & its neighbourhood, respectfully request your attention to the arrangement for the delivery [of] our letters.

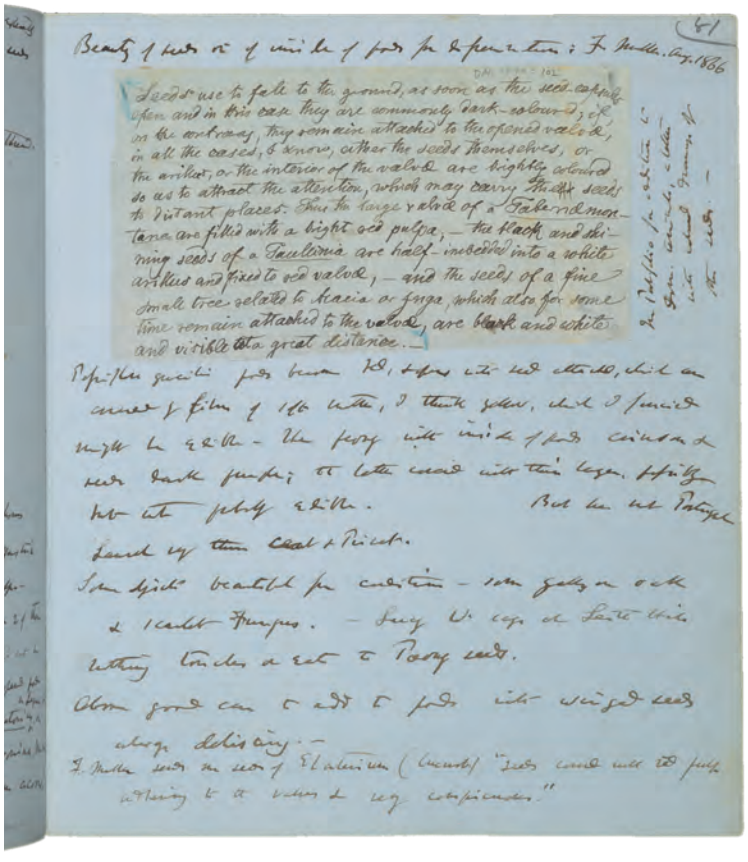
Letter to the secretary of the Post Office, [1845 - 51?]

Letters were so important to Darwin that he organised a neighbourhood protest to the Post Office about standards of service. He was worried that incoming post from London might arrive too late for his replies to be delivered on the same day.

DAR 96: 6

Seeds use to fall to the ground, as soon as the seed-capsules open and in this case they are commonly dark-coloured; if on the contrary, they remain attached to the open valvæ, in all the cases, I know, either the seeds themselves, or the arillus, or the interior of the valvæ are brightly coloured so as to attract the attention, which may carry the seeds to distant places. Thus the large valvæ of a Tabernaemontana are filled with a bright red pulpa;—the black and shining seeds of a Paullinia are half-imbedded into a white arillus and fixed to red valvæ,—and the seeds of a fine small tree related to Acacia or Inga, which also for some time remain attached to the valvæ, are black and white and visible at a great distance.—

Part of a letter from Fritz Müller, 2 August 1866, as it would have looked when pasted into Darwin's 'Experiment Book'.



Anatomy of a letter

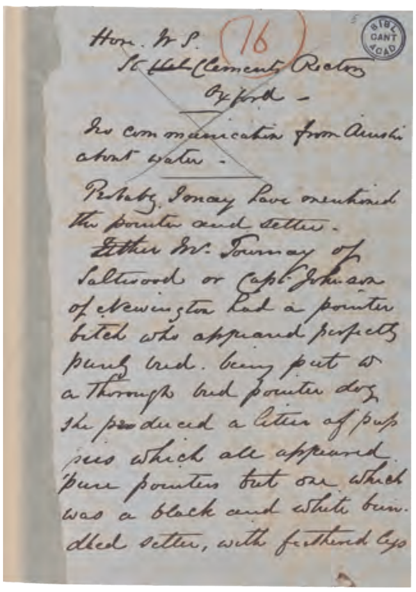
. . . some people are so foolish as to say that your handwriting, like mine, is not very legible.

(to Asa Gray, 8 January 1873)

Over nearly fifty years, the Darwin Correspondence Project team has tracked down, deciphered, researched, and published more than 15,000 letters that Darwin exchanged with nearly 2,000 correspondents.

To understand a letter, we need to know who wrote it and when, but around half the letters are undated and some are incomplete, with pieces scattered through Darwin's papers or even across different archives. Darwin's is not the only bad handwriting in the collection, and the signature is often the hardest part of a letter to read. Clues from both the content and the physical appearance of letters help us identify correspondents and establish dates.

Identifying the people, publications, plants, and animals that Darwin and his correspondents were discussing also involves some sleuthing. Scientific names have often changed and, just like Darwin, we have had help from many specialists around the world. We have put together short biographies of more than 9,000 people and amassed a bibliography of more than 11,000 titles.


Hon. W S. (16)
St ~~Hel~~ Clements Rectory
Oxford –
No communication from Aiushi
about water –
Probably I may have mentioned
the pointer and setter.
~~Either~~ Mr. Tournay of
Saltwood or Capt. Johnson
of Newington had a pointer
bitch who appeared perfectly
purely bred. being put to
a Thorough bred pointer dog
she produced a litter of pup
pies which all appeared
pure pointers but one which
was a black and white brin-
dled setter, with feathered legs

DAR 163: 5

Wall box

<u>What would you do with this?</u>

Only one page of this letter survives. The date, address, and signature are all missing. The subject matter doesn't help identify either the correspondent or the date: Darwin discussed cross-breeding in dogs with many different correspondents over several decades.

Letter from [John Innes], [after 8 February – August 1855]
DAR 163: 5

Wall box 2

We used all these directories and professional registers to cross-reference names and addresses. That narrowed down the date to just six months, but still left several possible correspondents. In the end it came down to a comparison of handwriting.

The Clergy List ... containing an alphabetical list of the clergy. **London: C. Cox [and others], volumes covering 1850 - 55**
CUL L117.c.59

The Army List. **London: printed for the compiler of the annual official army list; Her Majesty's Stationery Office, volume for 1855**
CUL OP4100.8.0221

Hart's Army List: **The new annual army list ... with an index. Compiled by H. G. Hart. London: John Murray, volume for 1856**
CUL L540.7.c.12

Post Office Directory of the Six Home Counties, viz., Essex, Herts, Kent, Middlesex, Surrey and Sussex. **London: W. Kelly & Co, volumes for 1851, 1855**
CUL L477.b.5

Case

Everything in this case relates to a single letter sent to Darwin on 2 August 1866 by Fritz Müller, a German settler in Brazil with whom Darwin exchanged more than a hundred letters. The letter covered a number of different subjects, including 'bright seeds'.

Darwin cut the letter up and pasted part of this and another letter from Müller, also about 'bright seeds', into his Experiment book, where he could make long notes. He wrote notes on other subjects in various colours on the letter and referred to it in several different publications.

4 **Part of letter from Fritz Müller, 1 and 3 October 1866**
DAR 157a: 103

5 **Charles Darwin's 'Experiment Book', 1855 - 68. Opening f.81**
DAR 157a

6 **Part of letter from Fritz Müller, 2 August 1866**
DAR 157a: 102

7 **Part of letter from Fritz Müller, 2 August 1866**
DAR 76: B33v and facsimile of reverse side B33r

Darwin reported Müller's observations on *Eschscholzia californica* (California poppy) in his own discussion of self-sterile plants.

1 ***The Effects of Cross and Self Fertilisation in the Vegetable Kingdom*, by Charles Darwin. London: J. Murray, 1876. pp. 332 - 3**
CCA.24.50

Darwin reported Müller's observations on the orchid Notylia in the second edition of his book, *The Various Contrivances by which Orchids are Fertilised by Insects.*

2 ***The Various Contrivances by which Orchids are Fertilised by Insects, by Charles Darwin. 2d ed., rev. New York: D. Appleton and Company, 1877. pp. 171 - 2 CCA.24.26***

3 ***Drawing and attached specimen of Notylia. F. Müller***
DAR 142: 38

We reconstructed the text of Müller's letter from pieces now scattered through Darwin's papers and located the specimens and drawings sent with it. We reunited one fragment with Darwin's 'Experiment book' and had the unnamed orchid in the watercolour identified by an expert. The full text is published in *The correspondence of Charles Darwin* volume 14 (1866), pp. 265 - 9.

8 **Watercolour and a specimen of the orchid *Sophronitella violacea*. Replaced from October with a facsimile**
DAR 76: B33a.1 and 2

will you be so kind as to observe whether Oxalis with you exhibits different forms . . .

(to Fritz Müller, 23 May 1866)

In response to a request from Darwin, Müller enclosed flowers of *Oxalis* (wood-sorrel) with his letter of 2 August 1866. Darwin demonstrated that different arrangements of female and male organs in individual plants promoted cross-breeding.

9 **Charles Darwin, *The Different Forms of Flowers on Plants of the Same Species*. London: John Murray, 1877. Opening pp. 170 -1**
CCA.24.52

10 ***Oxalis* specimen**
DAR 142: 97

Müller sent Darwin enough bright red seeds both for his experiments, and to make his daughter a necklace. Joseph Hooker identified them for Darwin as *Adenanthera pavonina*, 'red lucky seed.'

Drawing of Adenanthera seedpod with note by Charles Darwin n.d.
DAR 157a: 94r

The puzzle of 'bright seeds':

An opponent of ours might make a capital case against us by saying that here beautiful pods & seeds have been formed not for the good of the plant but for the good of birds alone.

(to Müller, [before 10 December 1866])

The puzzle:

Darwin's critics argued that his theories could not account for beauty in nature. Darwin explained the bright colours of berries and fruits as adaptations to attract birds and animals: they ate the soft fruit, excreted the hard seeds, and the plant's range was extended. But Fritz Müller sent hard, brightly coloured seeds from Brazil, with no surrounding pulp. Darwin fed some to a cockerel, to see if they would pass straight through and still germinate. He (or someone) watched for forty-eight hours, but there was no sign of them: 'The case', he wrote to Joseph Hooker, 'is a sore puzzle to me.'

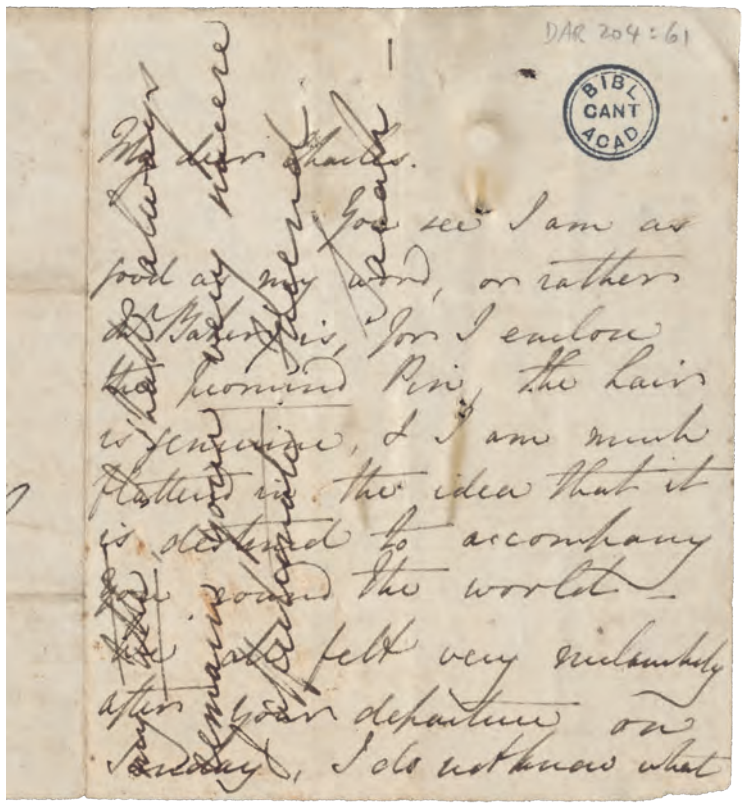
The answer:

130 years later an ecologist in Brazil, Mauro Galetti, re-ran many of Darwin and Müller's experiments. He concluded that these seeds fool inexperienced birds by mimicking fruits. The birds fly off with them but spit them out. Plants can waste fewer resources by not producing fruit pulp; and get away with it.

My dear Charles,

You see I am as good as my word, or rather Mr Baker is, for I enclose the promised Pin, the hair is genuine, & I am much flattered in the idea that it is destined to accompany you round the world—

We all felt very melancholy after your departure on Sunday, I do not know what Woodhouse will do without you for so long, but I hope & trust we may both meet with success in our respective new careers, & live to meet here again very very often; remember your promise about No.1, Belgrave St. & pray think of me in the mean time, & write whenever you have an idle half hour. I assure you my parting promise to you shall be most religiously kept, & you may expect a true & correct account from the Pen of the Sufferer herself—
I am so glad you have a short reprieve for the sake of your Family, though perhaps you are not so well pleased with the delay—
God bless you, my dear Charles, believe that whenever I may change my title, I shall always remain your very sincere & affectionate Friend | Sarah—


DAR 204 : 61
BIBL CANT ACAD

From Sarah Owen [27–30 September 1831] and enclosed pin

The Beagle voyage: Learning for a lifetime

I assure you no half famished wretch ever swallowed food more eagerly than I do letters.

(to Caroline Darwin, 24 October – 24 November [1832])

Just graduated and passionate about natural history, Darwin leapt at the chance to sail around the world with the naval vessel, HMS B*eagle*. Its mission was to chart routes and safe anchorages as part of Britain's imperial project.

Darwin was not part of the crew but was expected to make scientific observations and collect specimens. During the five-year voyage, from 1831 to 1836, he learnt to use letters for more than keeping in touch with home. He built on those skills for the rest of his life.

Letters kept him in touch with the ship on inland expeditions; letters introduced him to those with local knowledge, carried his emerging ideas back to the scientific world, and provided the raw material for *Journal of Researches*, the travel book that first made him a household name. Back in England, he honed his persuasive powers writing to experts for help with the many hundreds of specimens he had shipped back.

Wall box

I enclose the promised Pin, the hair is genuine, & I am much flattered in the idea that it is destined to accompany you round the world

Darwin was twenty-two when he joined the *Beagle*, and letters from home were full of gossip about flirtations and marriages. Sarah and Fanny Owen were Darwin's neighbours and childhood friends. He was heartbroken – or said he was – when the first batch of letters brought news of Fanny's sudden marriage. He kept both sisters' letters to the end of his life. Sarah's lock of hair does not survive.

Letter from Sarah Owen [27 - 30 September 1831] and enclosed pin
DAR 204: 61

[On wall] Sketch map of route from Santiago to San Fernando, Chile, Thomas Sutcliffe [28 August – 5 September 1834]
DAR 35.2: 405

Case

On my road to S. Fernando, I had some more hammering at the Andes

(to Caroline Darwin, 13 October 1834)

In August 1834 Darwin was in Santiago, Chile, on his way from Valparaiso on the coast to San Fernando at the base of the Andes. He wrote to the *Beagle*'s captain, Robert FitzRoy, that he couldn't get a map of the rest of the route. Thomas Sutcliffe, a European mercenary, was recently identified as the author of the unsigned map, drawn from memory, that Darwin followed. Sutcliffe also gave Darwin letters of introduction to use along the way. The entire journey is described in a letter to Darwin's sister Caroline.

2 **Letter to Robert FitzRoy, [28 August 1834], late 19th century copy made for Francis Darwin DAR 144: 115**

3 **Letter to Caroline Darwin, 13 October 1834**
DAR 223: 24

4 **Sketch map of route from Santiago to San Fernando, Chile, Thomas Sutcliffe [28 August – 5 September 1834]**
DAR 35.2: 405

This contemporary sketch by the *Beagle*'s artist, Conrad Martens, shows the view Darwin would have seen as he set out to trek from Valparaiso to Santiago on the first leg of his journey.

1 **Sketchbook I, Almendrals, Valparaiso, by Conrad Martens, 17 August 1834**
MS Add 7984 35v - 36r

A sample of copper ore collected by Darwin while staying at Yaquil in September 1834 on his way to San Fernando. Darwin was given a letter of introduction to 'Mr Nixon', the American owner of a mine there.

5 **Chalcopyrite specimen collected from Durarno Mine, Yaquil (*Beagle*. number 2260) Courtesy of the Sedgwick Museum of Earth Sciences, University of Cambridge**

On Thursday two packing cases were despatched for you at Geolog. Museum containing Geolog. Specimens collected on Voyage of Beagle.

Darwin kept only the geological and barnacle specimens to work on himself, distributing the rest to specialists. After his death, his sons sent the rocks, minerals, and fossils to Cambridge and they are now part of the collections in the Sedgwick Museum of Earth Sciences.

6 **Note from George Darwin to Thomas McKenny Hughes, 22 January 1897 and facsimile of reverse**
DAR 236: 7

Although he didn't know it at the time, extracts from Darwin's letters to John Stevens Henslow describing his observations and conjectures were read aloud at a meeting in Cambridge. Henslow also arranged for them to be published.

7 **Extracts from letters addressed to Professor Henslow. Cambridge, Cambridgeshire: John Henslow, 1835. Title supplied from unsigned prefatory statement (p. [1]) dated Cambridge, Dec. 1, 1835**
MF.38.72

your last Cargo . . . came safe to hand excepting a few articles in the Cask of Spirits which are spoiled, owing to the spirit having escaped thro' the bung-hole

(from John Henslow, 31 August 1833)

Henslow sent Darwin advice on how to prepare and ship specimens, and used his own correspondence networks to find experts to describe and identify them. One of those was Joseph Hooker, to whom Henslow sent Darwin's collection of plants from the Galápagos islands. That was the beginning of a lifelong correspondence. Hooker became Darwin's closest friend. They met quite often, yet there are more than 1,400 of their letters, by far the largest single exchange.

8 **Specimens of *Scalesia*, giant daisy tree, collected by Darwin on Chatham Island in September 1835 and described by Joseph Hooker**

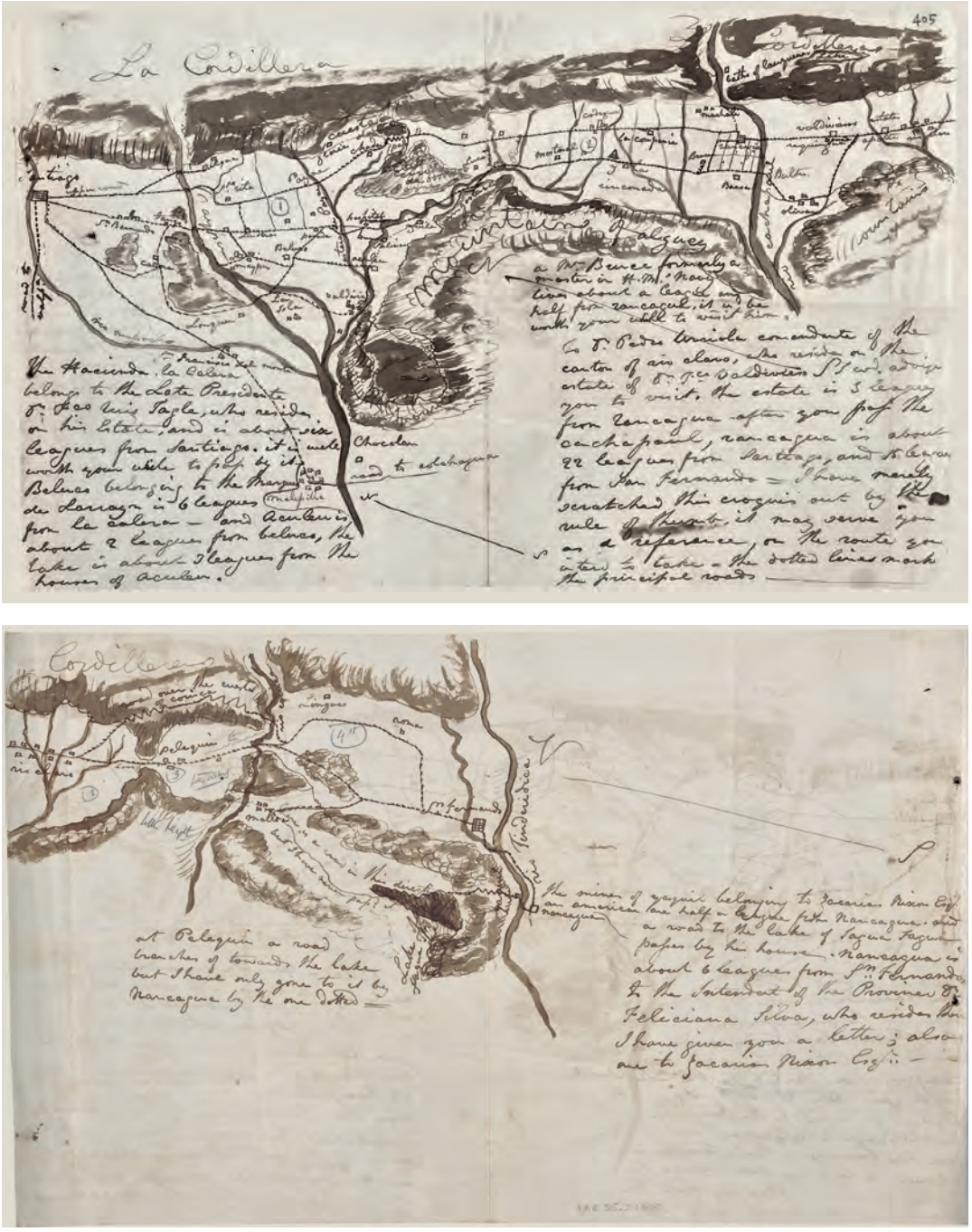
Cambridge University Herbarium, 09597: *Scalesia incisa*; holotype native to the Galápagos

9 **Letter from John Henslow, 31 August 1833**
DAR 97: B14 - 15

10 **Darwin's first letter to Joseph Hooker, [13 or 20 November 1843]**
DAR 114: 1

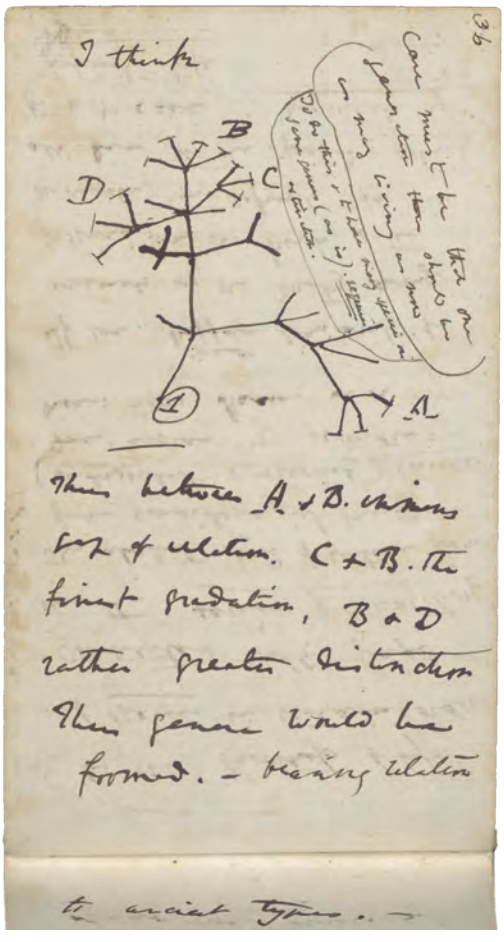
Scientist:

Darwin never used the word 'scientist': he described himself as a 'naturalist' and referred to 'men of science'. We have chosen to use 'scientist' with its modern meaning for convenience. The word 'scientist' was not coined until 1833. It was first used as a derogatory term to imply that natural philosophers (as men of science were then called) were becoming too specialised to be considered philosophical. It only began to shake off this meaning from the 1840s. References to 'scientists' in Darwin's correspondence begin to appear only in the 1870s in letters from North America.



DAR 35.2: 405 (recto and verso)

Notebooks



DAR 121: 36 (Notebook B)

Notebooks

In March 2022, two notebooks belonging to Charles Darwin – one of which contained his iconic 'Tree of Life' sketch – were returned to Cambridge University Library following their disappearance more than two decades earlier. The notebooks were anonymously returned in a bright pink gift bag and left outside the Librarian's office, with a note reading:

Librarian

Happy Easter

X

The Tree of Life sketch forms part of Darwin's Notebook B and is perhaps the most well-known of all Darwin's manuscripts. It was found to be missing, along with an almost identical notebook (Notebook C) in January 2001, after a routine photography request in November 2000.

It was initially believed that the small blue box containing Notebooks B and C had been mis-shelved among the University Library's vast collections (which today number around ten million physical items).

However, in November 2020, following numerous painstaking searches, Cambridge University Librarian Dr Jessica Gardner announced that the notebooks had likely been stolen and launched a worldwide appeal for information that might lead to their safe return. The subsequent global press coverage of their disappearance and return was the most extensive in the University's history.

The circumstances around the notebooks' disappearance have been the subject of a police investigation, and the story is one of the most perplexing events in the library's extraordinary 600-year history. We are delighted that the notebooks were safely returned to take their rightful place at the heart of the UK's cultural and scientific heritage.

Darwin's Notebooks: 'I think . . .':

In 1837, living in London and just off the *Beagle*, Darwin began tackling the problem of the origin of new species. In a series of pocket notebooks, he recorded observations, readings and ideas that led ultimately to his discovery of natural selection. Projects that Darwin would pursue in correspondence throughout the rest of his life—from pigeon breeding to the origins of morality—commence in these remarkable documents.

Like his letters, the notebooks show Darwin in constant conversation. Darwin did not discover natural selection on the Galapagos, but in the largest city on Earth at the heart of an expanding empire of commerce and trade. Here he could be in dialogue with a vibrant community of naturalists, geologists, economists and philosophers. Darwin jotted down the records of encounters at the zoo and conversations with his barber, dog breeders, sheep farmers, gardeners, and his father and family. He explored the consequences of his theory for religion and morals, and dreamt of execution. The notebooks are private, as the subjects were controversial. But they represent a dense network of social interaction.

The notebooks also show Darwin changing his mind. Initially he theorized that evolution occurred through a developmental process akin to sexual reproduction, drawing on ideas from his grandfather, the evolutionary poet Erasmus Darwin. The early notebooks thus focus on heredity and other topics relevant to reproduction.

In the first of the notebooks Darwin drew three trees. During the past few decades, one of these has become an iconic symbol of evolutionary thinking. For Darwin, however, the Tree of Life was an attempt to work out a specific problem, the numerical balance between extinct and living species. Extinct species are blocked off with a perpendicular line; existing ones are shown to continue. At this stage in Darwin's thinking, it was important that the new species replaced old ones on a consistent basis.

In September 1838, Darwin abandoned his reproductive theory after reading Thomas Malthus's *Essay on the Principle of Population*, first published in 1798. This was a controversial book on human populations, widely discussed in relation to emigration and reproductive politics. Malthus argued that scarce resources limited population growth. Applying the Malthusian doctrine to the whole living world, Darwin realized that only the best adapted individuals within any species would survive to leave offspring, and that gradual changes inherited over many generations would lead to the formation of new species.

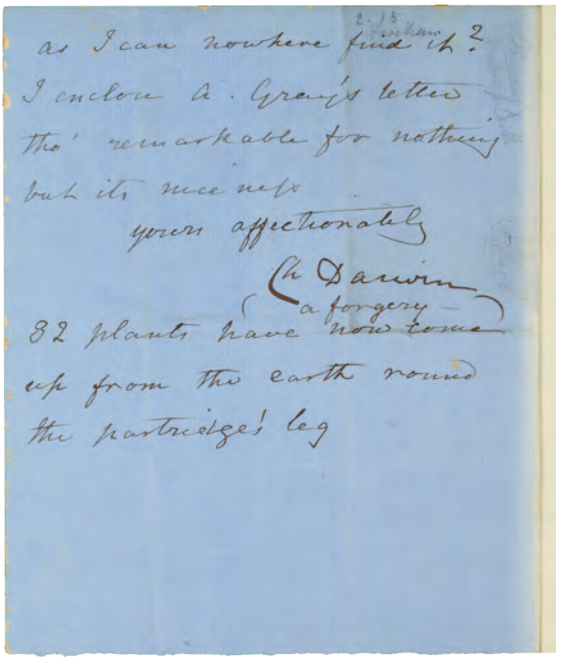
This was Darwin's theory of natural selection, published in the *Origin of Species* in 1859 and the foundation for the life and environmental sciences today.

Down Bromley Kent
Mar 26

My dear Hooker

Since receiving your pleasant letter of Feb. 9. I have daily been wishing to scribble to you in pencil, but have been unable from having had a good deal more sickness. We have had Dr Jenner down to see me, who feels sure there is no organic mischief & thinks I shall some day get over the sickness. The last lot of plants are doing well & I am very much obliged for them. They are a great amusemt to me & I have one or 2 of them in my bedroom at a time; not that the subject is worth all the trouble I give it. You once said that you thot Veitch was a mere tradesman. Lately I ordered between 2 & 3£ worth of climbing plants from him. I told him that they were for observation as I begged him to choose growing plants. In answer he sent me more than I ordered & absolutely declined any payment, was not this very handsome, tho' in one sense rather a bore? I am so magnificent that I am thinking of building a large greenhouse & turning the present green house into a cool Stove. Do look how Nepenthes climbs? to which you alluded— You did not answer me about Vanilla but I suppose it climbs by rootlets & if so I do not care—
<u>Sunday morning</u>—
Hurrah! I have been 52 hours without vomiting!! I have had a capital letter from John Scott, but I grieve to hear that he has left Bot. Garden & says nothing about the cause or the future. I hope he has not quarrelled.— Pray tell me whether any steps have been taken about his Associateship. Linn: Socy. I earnestly hope it will not be forgotten— Have you settled for the Duke of Northd. Man? It must have been a fearful responsibility.—
Àpropos to what Frankland quotes I shd be very much obliged if you wd ask Tyndall when you next see him whether he supposes if only ½ the present amount of snow fell on the Alps, that the climate of Europe fell to that of Greenland, whether the glaciers wd not greatly advance? I see the importance of the fall of snow, but does not Frankland exaggerate its importance. F. ought to look into my journal for the extraordinary flexure in the snow line in S. Chile. What superb work Tyndall seems to be doing as I see in the Reader Blessings on the Ed. he gives me a weekly treat.
What a pity it is that Huxley & Falconer shd make their attacks & squabbles so public! Jukes has risen greatly in my opinion from the matter & more especially from the spirit of his letter.
I have 1 or 2 little questions Is E. Blyth settled in Dublin?
Is Owen's lecture at Exeter Hall published?
Please tell me to what order Siphomeris lingua belongs as I can nowhere find it? I enclose A. Gray's letter tho' remarkable for nothing but its niceness

yours affectionately | Ch Darwin | (a forgery—)
82 plants have now come up from the earth round the partridge's leg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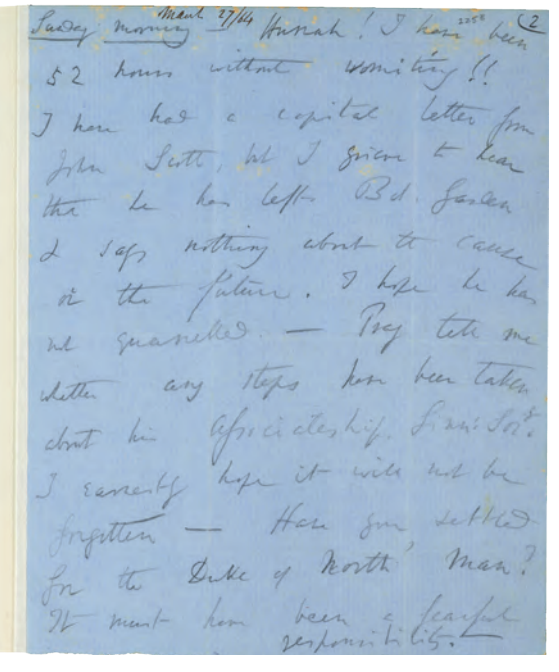

Sunday morning March 27/64 Hurrah! I have been (2)
52 hours without vomiting!!
I have had a capital letter from
John Scott, but I grieve to hear
that he has left Bot. Garden
& says nothing about the cause
or the future. I hope he has
not quarrelled. — Pray tell me
whether any steps have been taken
about his Associateship. Linn. Soc.
I earnestly hope it will not be
forgotten — Have you settled
for the Duke of North'd Man?
It must have been a fearful
responsibility.

To J. D. Hooker, 26[–7] March [1864], in the hands of Emma Darwin and Charles Darwin. Emma forged her husband's signature.

Working from home

My life goes on like Clockwork, and I am fixed on the spot where I shall end it

(to Robert FitzRoy, 1 October 1846)

After the *Beagle* voyage, Darwin never went abroad again. He worked from home, but was far from isolated. His wife and children helped with correspondence. His family, friends, and household staff were his research assistants, editors, critics, and sometimes his research subjects. The house and garden were his laboratory. This intimate world is revealed only through his most private letters. They also sometimes reveal Darwin's frustrations and false starts.

Darwin married his cousin Emma Wedgwood in 1838, started a family in 1839, moved from London to the village of Down, Kent, in 1842, and lived there for the rest of his life. He and Emma had ten children. One daughter, Annie, died at the age of ten, and two others as babies. Their last baby, a son named Charles, died just a few days before Darwin's theory of natural selection was first made public in a joint paper with the evolutionist and explorer Alfred Russel Wallace.

On Wall

Darwin was photographed by the well-known portraitist Julia Margaret Cameron while on holiday in the Isle of Wight in the summer of 1868. The Darwins rented a cottage from Cameron and they became friends.

Photograph of Charles Darwin, by Julia Margaret Cameron, 1868. Facsimile. National Portrait Gallery, London

I have the old M.S, otherwise the loss would have killed me!

(to Joseph Hooker, 12 [April 1859])

This rare page of Darwin's first draft of *Origin* was kept only because it was reused by his children as drawing paper. This was a dangerous practice: part of a later version sent to Joseph Hooker for comment was destroyed when it was mixed up with discarded notes used for drawing by Hooker's family. Luckily Darwin still had his earlier copy.

Original manuscript leaf for *Origin*, 'Sect 9. Geology', November - December 1858
DAR 185.109: 26

Replaced from October with original manuscript leaf for Origin, 'Sect 1 Variation under domestication', July – August 1858
DAR 185.109: 6

Case

I have told him that that great Saint though always kind to worshippers is not always in a condition to be worshipped

(from Thomas Huxley, 20 July 1868)

Darwin's admirers often asked his friends if they could arrange an invitation to Down. Huxley's irreverent sketch was inspired by a request from the German physiologist Wilhelm Friedrich Kühne for an 'audience' with the great man. Darwin was on holiday in the Isle of Wight and sent regrets.

Caricature of Darwin as a saint, Thomas Huxley, 20 July 1868
MS Add. 10334

DAR.LIB.160 p. 120

One morng. Mr. Darwin brought in some photographs taken by a Frenchman . . . to see if we read aright the expression

(from Jane Loring Gray to Susan Loring, 28 October – 2 November 1868)

Between March and November 1868 Darwin showed a succession of visitors some photographs of human faces made by a French physiologist, Guillaume Duchenne, recording their reactions in a series of tables. Darwin published his findings in *The Expression of the Emotions in Man and Animals* (1872).

Cross-referencing with Darwin's letters revealed the order of his three unnumbered tables, two of which are displayed here. Darwin refined the experiment: the first guests were asked only whether the photographs showed the emotion Duchenne claimed to have recreated. Later guests described the emotion in their own words.
Jane Gray and her husband Asa visited Down in October 1868; she reported the experiment in a letter to her sister.

2 **Expression queries, tabulation of responses, 22 - 31 March 1868**
DAR 186: 27

3 **Selection of photographs from *Mécanisme de la physionomie humaine, ou analyse électro-physiologique de l'expression des passions.* 1 vol. and 'Atlas' of plates, by Guillaume Duchenne. Paris: Veuve Jules Renouard, Libraire, 1862. Facsimiles of plates from DAR.LIB.160**

4 **Expression queries, tabulation of responses, 24-30 October 1868**
DAR 186: 28

Replaced from October with expression queries, tabulation of responses, 31 March – 29 August 1868
DAR 186: 29

… I repeatedly stationed five or six of my children, each close to a buzzing place, and told the one farthest away to shout as soon a bee buzzed there: "here is a bee"…

(to Hermann Müller, [before 5 May 1872])

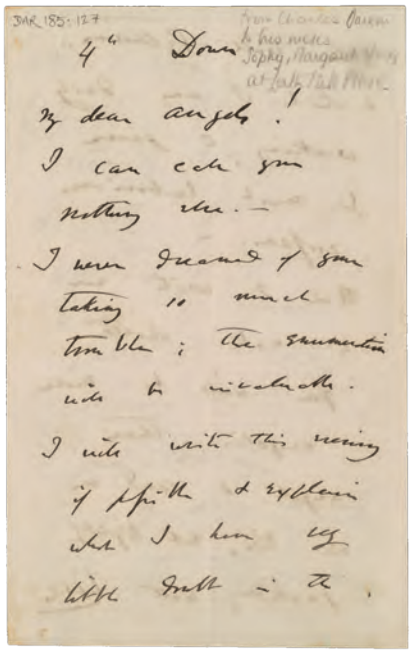
Darwin never published the observations he and his children made on the flight paths of bees around their home. The Darwin children had to crawl along a ditch to plot part of the bees' route. Years later Darwin offered his notes to a German correspondent, Hermann Müller, who was working on similar questions. This sketch map that Darwin kept shows the route from the kitchen garden past the sandwalk wood.

5 **Humble Bees Notebook, Charles Darwin, 1850s - 1860s**
DAR 194: 1

Hurrah! I have been 52 hours without vomiting!!

When his friends got letters from Darwin in pencil, they knew something was wrong. Darwin dictated the first part of this letter to his wife, Emma, as he was suffering one of his frequent bouts of sickness. He wrote the last page himself, but in pencil as he could not sit up to use a dip pen.

6 **Letter to Joseph Hooker, 26[- 7] March [1864]**
DAR 115: 225 a and b



DAR 185: 127

I hate myself I hate clover & I hate Bees

(to John Lubbock, [3 September 1862])

Darwin and Lubbock were friends and near neighbours. They met and talked often, so there are few letters between the two men and some tantalising gaps. Darwin had asked Lubbock to corroborate observations he had made on the behaviour of bees around clover. He quickly realised he had made a mistake and wrote to apologise for wasting Lubbock's time.

7 **John Lubbock's bound collection of Darwin's letters**
DAR 263: 55

My dear Angels! I can call you nothing else.

(to Katherine, Lucy, and Margaret Wedgwood, 4 [August 1862])

Darwin's entire extended family were involved in his work. As teenagers his nieces often collected specimens or made observations for him. He had asked them to look at the structure of the flowers in *Lythrum* (loosestrife) for his research into adaptations that promoted crossbreeding.

8 **Letter from Margaret Wedgwood, [before 4 August 1862]**
DAR 181: 64

9 **Letter to Katherine, Lucy, and Margaret Wedgwood, 4 [August 1862]**
DAR 185:127

Darwin's study at Down House
DAR 225: 2

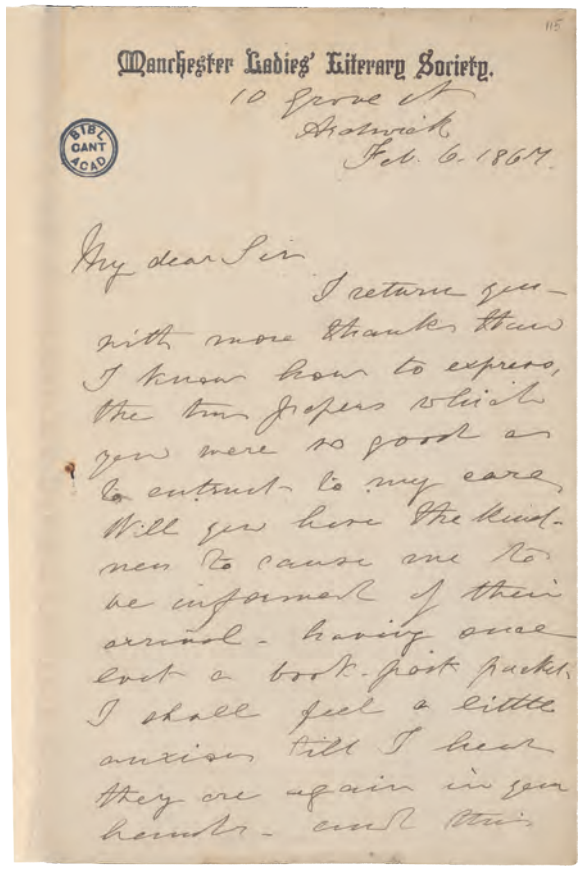

18

Manchester Ladies' Literary Society.
| 10 Grove st | Ardwick
Feb. 6. 1867.

My dear Sir

I return you—with more thanks than I know how to express, the two papers which you were so good as to entrust to my care. Will you have the kindness to cause me to be informed of their arrival—having once lost a book-post packet I shall feel a little anxious till I hear they are again in your hands—and this induces me to give you the little extra trouble involved in registering the packet—for which I must apologise. I have transcribed portions of them, and made large copies of the diagrams— I hope this was not wrong—without your permission, but I thought, as they were printed—I might do so without impropriety.
The arrangements in Lythrum are indeed most marvellous. It sets one wondering whether different sized stamens in the same flower can ever be quite without meaning, and if there is any difference in the action of the pollen of the long and short stamens in didynamous and tetradynamous flowers. In the N. O. Geraniaceae it seems as if there might be some transition going on—for in <u>Geranium</u> each alternate s tamen is smaller, and in the allied genus <u>Erodium</u> the alternate stamens have become sterile. Can it be possible that this genus was once dimorphic, and one of the female forms having by any means become exterminated, the corresponding set of stamens have shed away? If one of the forms of Lythrum were to disappear—two sets of stamens would be made useless to the species, and it is conceivable that they might then gradually become abortive.
I obeyed your directions about the paper on Climbing Plants and the insight into their extraordinary and regular movements was a new revelation to all of us. I made large copies of the diagrams and dived into my herbarium for specimens of each class of climbers, bringing up enough to make a goodly show. Luckily a collection of ferns from the islands of the South Pacific recently presented to me contained a specimen of one named in your paper <u>Lygodium scandens</u>. Till I read it I had never dreamed of twiners in this class, as none of our British ferns have the habit, but as the "march of intellect" seems to be the order of the day, even in the vegetable world, there is no telling what they may accomplish in time! Our society appears likely to prosper beyond my expectations the countenance you have afforded has been of wonderful service, and I do hope that by becoming useful to its members it may prove in some degree worthy of the generous encouragement you have given us.
The ladies who had the privilege of listening to the paper desire to express their thanks to you for it, which I hope you will be pleased to accept.

Believe me to be | yours gratefully | Lydia E. Becker.


Manchester Ladies' Literary Society.
10 Grove St
Ardwick
Feb. 6. 1867.
BIBL CANT ACAD
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From Lydia Ernestine Becker 6 February 1867

The state of things

What my own views may be is a question of no consequence to any one except myself.— But as you ask, I may state that my judgment often fluctuates.

(to John Fordyce, 7 May 1879, on religion)

Darwin's letters tell a more nuanced story about his life and thinking than is apparent in his published writing. He is sometimes portrayed as a recluse who left others to fight his battles for him, but he was active in his local community and campaigned on the role of science in public life. He avoided talking publicly about religion or sharing his personal beliefs but was friends with the local vicar and protective of the church as a key part of village life. He lobbied parliament in support of experimentation on live animals, but also campaigned against animal cruelty.

For all his progressive thinking, Darwin remained a wealthy Englishman who believed in the intellectual and moral superiority of white Europeans. In *Descent of Man* he wrote that natural selection would result in the extinction of some societies, and that, on average, modern men had greater 'mental power' than women. And yet, Darwin encouraged the scientific ambitions of his female correspondents and was horrified by slavery.

Asa Gray

On Wall

The whole affair is a great misfortune in the progress of the World; but I shd not regret it so much, if I could persuade myself that Slavery would be annihilated.

(to Asa Gray, 21 July [1861])

Darwin had encountered enslaved people in South America and consistently sympathised with the northern states in the American Civil War, hoping that a Union victory would lead to the abolition of slavery throughout the states. In this letter, Gray, a Unionist, could say only that slavery was 'limited, past all doubt—however the combat ends'. Darwin circulated Gray's letters on the politics of the war to Joseph Hooker and others. Hooker's advocacy of British aggression towards the north had strained his friendship with Gray to the point where they were barely corresponding.

Letter from Asa Gray, 10 November 1862
DAR 165: 122

Case

I hope that you will reflect over the state of things in the Parish

(draft to John Innes, 1 December 1868)

John Brodie Innes, absentee vicar of Down parish, had appointed two curates in succession accused of embezzlement and womanising. As a former treasurer of the Sunday school, Darwin was left picking up the pieces. He told Innes that he feared the reputation of the Church would be 'lowered in the estimation of the whole neighbourhood'.

1

Letter to John Innes, 1 December 1868 (draft)
DAR 96: 53

I am sometimes amused at the look of wonder which follows my statement in the midst of a Darwinian theory discussion. "Mr Darwin is one of my very most valued and dearest friends".

(from John Innes, 21 January 1871)

Innes was never wholly won over to natural selection, but he and his family were friends of the Darwins. He added the occasional observation about plants or animals to his letters. He was succeeded as vicar of Down in 1871 by George Sketchley Ffinden, who disapproved of Darwin. Emma Darwin, who led Sunday prayers in her own household, referred to Ffinden as 'the Ffiend.'

2 **Letter from John Innes, 28 January 1870**
DAR 167: 27

3 **Letter from John Innes, 21 January 1871**
DAR 167: 28

Our society appears likely to prosper beyond my expectations the countenance you have afforded has been of wonderful service . . .

(from Lydia Becker, 6 February 1867)

Lydia Becker was prominent in the women's suffrage movement and advocated for science education for women. She corresponded with Darwin about her observations on plants and sent him a copy of her book on botany 'intended chiefly for young ladies'.

Women were prevented from joining most scientific societies so Becker set up the *Manchester Ladies' Literary Society*, devoted primarily to science. At her request, Darwin sent a copy of his paper 'Climbing plants', to be read at the inaugural meeting on 30 January 1867.

4 ***Botany for Novices: a Short Outline of the Natural System of Classification of Plants,* by Lydia Becker. London: Whittaker & Co., pp. 16 - 17, 1864**
CUL 140.1.75

5 **Letter from Lydia Becker, 6 February 1867**
DAR 160: 155

I cannot but think that the principle on which you are acting is right, and if you succeed you will have conferred an enormous benefit on the public.

(to James Torbitt, 4 April 1876)

Darwin was shocked by the human cost of the 1845 potato famine. When James Torbitt, a Belfast wine merchant, seemed close to developing a blight-resistant potato, Darwin supported him financially, campaigned (unsuccessfully) for government funding, and allowed Torbitt to use his name. Torbitt's approach was based on Darwin's conclusions about the greater vigour of cross-bred varieties: he proposed growing plants from seed modified through generations of painstaking inter-crossing rather than from pieces of the parent potato. Despite the threat of a new famine in 1880, Torbitt's scheme was never realised.

6 **Photograph of James Torbitt,**
c. 1860, Public Record Office of Northern Ireland

7 **James Torbitt's publication of Darwin's letters.**
***Belfast News-Letter*, 22 April 1876, p. 2**
British Newspaper Archive

The Zoological Stations of Naples and the naturalists diferent nations there assembled presents their warmest congratulations to the veteran of Modern Zoology on the occaison of this seventieth Birthday

Darwin was actively involved in international scientific collaboration. A few years before this birthday telegram he had helped raise funds to keep the marine research laboratory at Naples open.

Always keen on faster ways of communicating, in the 1870s Darwin lobbied his friend and neighbour, the MP John Lubbock, to get a telegraph office in their village; he wasn't successful.

8 **Telegram from the Naples Zoological Station, 12 February 1879.**
Replaced from October with a facsimile
DAR 172: 2

On Wall

You ask about my opinion on vivisection. I quite agree that it is justifiable for real investigations on physiology; but not for mere damnable and detestable curiosity.

(to Edwin Ray Lankester, 22 March [1871])

As a local magistrate Darwin insisted on better treatment for working animals; he supported the RSPCA and campaigned against the use of steel traps. He was convinced however of the importance to medical knowledge of vivisection – invasive experiments on live animals. He wrote dozens of letters to leading experimenters, medics, and public officials, and involved family and friends in drafting an alternative bill for Parliament designed to regulate the practice rather than ban it.

An appeal, by Charles and Emma Darwin. Bromley, Kent, privately printed. [1863]
Christ's College, Cambridge

Draft bill to regulate vivisection. Drawn up by Charles Darwin and others; annotations by Richard Buckley Litchfield, 1875
DAR 139.17: 21

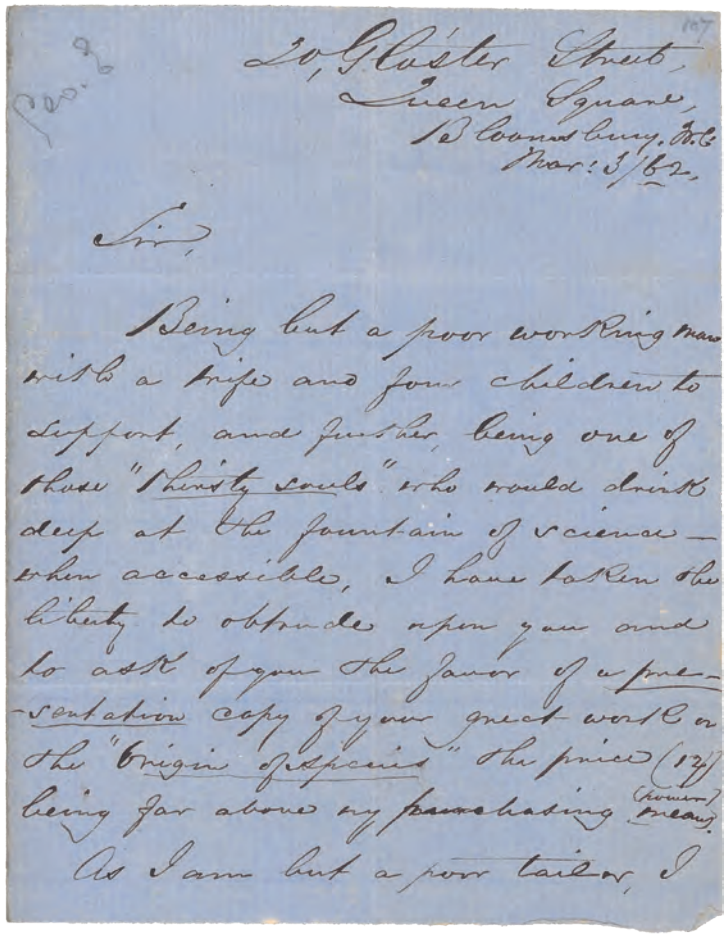
20, Glo'ster Street, | Queen Square, |
Bloomsbury, W.C.
Mar: 3/62.

Sir,

Being but a poor working man with a wife and four children to support, and further, being one of those "thirsty souls" who would drink deep at the fountain of science—when accessible, I have taken the liberty to obtrude upon you and to ask of you the favor of a presentation copy of your great work on the "Origin of Species" the price (12/-) being far above my purchasing means. (power) As I am but a poor tailor, I am desirous not to ask the labor of others for nothing, and shall, in return, be but too glad to do work for the amt. "My soul thirsteth after Knowledge" is the apology I make for my obtrusion, and remain, Sir,

| yours faithfully, | Geo: E. Harris.

C. Darwin, Esqr.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As I am but a poor tailor, I

From George E. Harris 3 March 1862

Writing and re-writing Origin

If I lived 20 more years, & was able to work, how I shd. have to modify the "Origin", … Well it is a beginning, & that is something.

(to Joseph Hooker, [22 January 1869])

On the Origin of Species **was not the book Darwin set out to write, and for such an iconic work the text was far from static. The publication of the first edition in 1859 was just one moment in a dialogue between Darwin and his collaborators, critics, and the wider public. Over succeeding editions of *Origin* and his other books too, he responded to criticisms and incorporated new observations and ideas from many sources.**

Darwin's letters allow us to see *Origin* as he saw it, as one part of a long-running research and publication programme, and to unpick both its prehistory and its complex later life. Each edition of *Origin* had its own preoccupations and correspondents, but some conversations wove in and out through several editions.

Large Case

. . . if by any chance you have my little sketch of my notions of "natural Selection" & would see whether it or my letter bears any date, I shd. be very much obliged.

(to Asa Gray, 4 July 1858)

In 1856 Darwin drew up a detailed plan for a 'big book', to be called *Natural Selection*. He was writing it in June 1858 when Alfred Russel Wallace sent him an almost identical theory.

The previous year Darwin had enclosed a six-page outline of his species theory in a letter to Asa Gray. At the bottom of Darwin's copy is a note: 'This was sent about 9 months ago'. This was evidence that Darwin had shared his own ideas before Wallace's letter arrived.

Darwin summarised the arguments of the 'big book' in *Origin* and used the text in other publications.

1 **'Natural selection' summary of book plan, October - December 1856. Chapter 5. Struggle for Existence; Chapter 6. Natural Selection**
DAR 8: A4r

2 **1857 Outline of Species Theory, draft, September 1857**
DAR 6: 56r

I suppose "natural selection" was bad term but to change it now, I think, would make confusion worse confounded.

(to Charles Lyell, 6 June [1860])

The term 'natural selection' caused Darwin no end of trouble. Many people from his publisher to fellow scientists misinterpreted it.

Natural selection: this was Darwin's term for the bundle of adaptive processes that led over long periods of time to the formation of new species. He chose it as a contrast to 'artificial selection', by which breeders enhance desirable traits in plants and animals. The term is often misunderstood as implying an active choice or 'intelligent chooser' rather than the passive survival of naturally occurring advantageous variations.

Survival of the fittest: This was not Darwin's term. It was coined as an alternative to 'natural selection' by the philosopher Herbert Spencer. Darwin used it alongside 'natural selection' from the fifth edition of *Origin* in 1869. Shorthand for the survival and continuation of those organisms best suited to take advantage of their circumstances, the term is often misinterpreted simply to mean the survival of the strongest or most healthy.

I am infinitely pleased & proud at the appearance of my child.

(to the publisher John Murray, [3 November 1859], on the publication of Origin.)

This copy of the first edition of *Origin* is Darwin's own and was the first one he saw. The full title is *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.* Today we use the word 'race' exclusively in reference to humans, but Darwin and his contemporaries used it to mean simply varieties or species of any organism including humans.

***Our Cats and All About Them*, by Harrison Weir, pp. 16. Detail. Biodiversity Heritage Library**

3 ***On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, by Charles Darwin. London: John Murray, 1859 CCA.24.17**

when you say natural selection acts so as to choose those that are fittest it is misunderstood & apparently always will be

(from Alfred Russel Wallace, 2 July 1866)

Darwin made notes in his copy of the second edition of *Origin* for the enlarged definition of 'natural selection' that he used in the third. Alfred Russel Wallace urged him to replace it with Herbert Spencer's term 'survival of the fittest' entirely; Wallace went through his own copy of the first edition crossing out 'natural selection' and pencilling 'survival of the fittest' in the margin. Darwin was partly persuaded and adopted it in the fifth and later editions, but alongside, rather than replacing, 'natural selection'.

4 **Alfred Russel Wallace's copy of *Origin,* pp. 84 - 45 CUL Keynes.M.2.27**

5 **Darwin's copy of the second edition of *Origin*, with Darwin's annotations on the term 'natural selection' opening pp. 84-85 CCA.24.18**

6 **Letter from Alfred Wallace, 2 July 1866 DAR 106: B33 - 8**

I have purposely postponed writing to you again until I had an opportunity of making further observations upon my white cat.

(from John Rodwell, 31 October 1860)

Every edition of *Origin* from the third onwards listed additions and corrections, many traceable to information in letters. William Hallowes Miller sent a correction on the thickness of the walls of bees' cells. Darwin's sister-in-law Frances Wedgwood supplied a collection of blind cave animals. Jeffries Wyman sent a report of resistance to poison in black pigs in support of Darwin's theory of 'correlation of colour'. Darwin's conclusions on correlation in cats had been undermined by, among others, his old school friend, John Rodwell.

7 **Origin 3rd edition. London: John Murray, 1861 CCA.24.20**

8 ***The Field,* Vol. 21, no. 540, Saturday 2 May 1863, cover and p. 416, letter to the editor by M.B.W., 'ARE CATS WITH BLUE EYES INVARIABLY DEAF?'. Facsimile of Buckley.Bb.5**

9 ***Our Cats and All About Them*, by Harrison Weir, pp. 16 - 17. Tunbridge Wells: R. Clements and Co., 1889**
CUL B.15.50

10 **Letter from John Rodwell, 31 October 1860**
DAR 47: 167-8

Small Case

though I much like making money, I care very much more about the wide distribution of my books

(to Robert Cooke, John Murray publishers, 29 June [1875])

In contrast to the changing text, the first four editions of *Origin* look almost identical. The fifth has a different cover and smaller margins to accommodate a mass of new material, but the sixth is very different: a cheaper, consciously 'popular' edition. This was the last version Darwin intended to publish, and he was determined to reach the widest possible audience. He was disappointed when the cover price was fixed at seven shillings and sixpence, too high he thought for a general public 'accustomed to novels for 1s'.

1 ***The Origin of Species by Means of Natural Selection: or, The Preservation of Favoured Races in the Struggle for Life*, by Charles Darwin. 6th edition, with additions and corrections to 1872. London: John Murray, 1872**
CCA.24.24

2 **Draft advertisement for 'Sixth & Cheap' edition of *Origin*, by Charles Darwin. Facsimile. National Library of Scotland, John Murray Archive**
Ms. 42152 ff. 228-31

I have taken the liberty to obtrude upon you and to ask of you the favor of a presentation copy of your great work on the "Origin of Species"

Darwin sent this copy of the first edition of *Origin* to George Harris, a tailor, who couldn't afford the twelve-shilling cover price. Harris had offered to work in exchange.

3 **Letter from George Harris, 3 March 1862**
DAR 166.1: 107

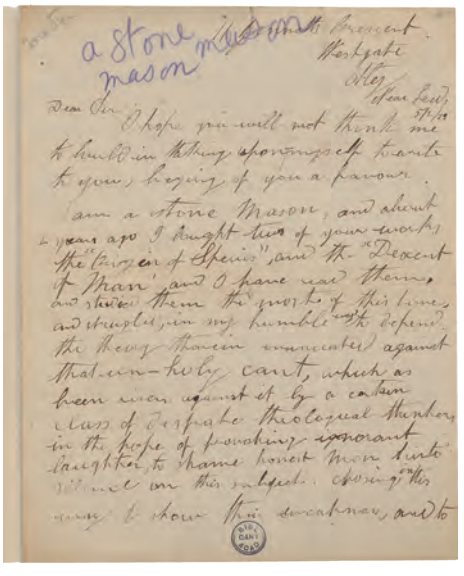
4 **Letter to George Harris, 5 March [1862], with Harris's copy of the third edition of *Origin*. London: John Murray, 1859**
Private collection

I have been told on authority which I can trust that in Lancashire, workmen club together to buy the Origin.

(to John Murray, 3 June [1871])

Darwin had evidence from his own postbag of the difficulty working people had in affording his books. Thomas Maston was a stonemason who had managed to buy *Origin* and *Descent of Man*, but business had been bad, and he could not afford to buy *Expression*. He wrote to Darwin for help.

5 **Letter from Thomas Maston, 5 February 1879**
DAR 171: 88


a stone mason

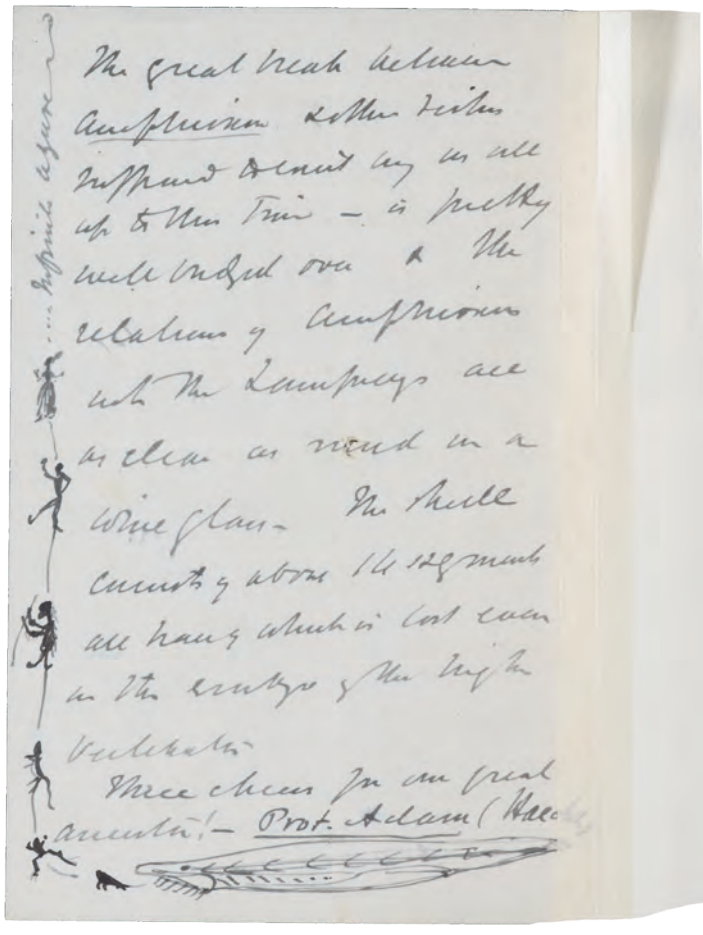
DAR 171: 88

4 Marlborough Place | NW
Dec. 8th 1874

My dear Darwin

Best thanks for Semper It is an interesting but monstrous illnatured article (he doesn't attack me) and it serves him right that he has not only been completely anticipated by Balfour— but that Balfour's must [*foot of page excised*] *shew that he has altogether blundered in his interpretation of the fact. Indeed the only value of the paper is that it confirms Balfours statement as to fact I will return the paper to you as soon as I have made some excerpts*
It did us good on Sunday to see how well & [*foot of page excised*]
P.S. | I forgot to say that I have been making out wonderful things about <u>Amphioxus</u> His skull & brain are bigger in proportion (or at any rate longer) to his body than yours— and the theory of the vertebrate skull that I have been grinding at these seventeen years, is I believe just as clear proving at last the great break between <u>Amphioxus</u> & other fishes supposed to exist by us all up to this time—is pretty well bridged over & the relations of Amphioxus with the Lampreys are as clear as mud in a wine glass—
The skull consists of above 14 segments all trace of which is lost even in the embryo of the higher vertebrates

Three cheers for our great ancestor!— <u>Prot. Adam</u> (Haeckel)



DAR 53.1: C163

From T. H. Huxley 8 December 1874

Humans and other animals

Our ancestor was an animal which breathed water, had a swim-bladder, a great swimming tail, an imperfect skull & undoubtedly was an hermaphrodite! Here is a pleasant genealogy for mankind.

(to Charles Lyell, 10 January [1860])

The research, writing, and production of Darwin's books about human evolution can be followed in detail in over five hundred surviving letters. *Descent of Man and Selection in Relation to Sex (Descent)*, and *The Expression of the Emotions in Man and Animals (Expression)*, were published in 1871 and 1872. Darwin's aim was to establish not only the unity of the human species but continuity between humans and other animals. He explored evidence for common physical ancestry, and also for the evolutionary roots of such apparently exclusively human emotions as shame and grief.

DAR 171: 88

On Wall

Attend to the ears in lower figure, laid back & the wrinkles under eyes

These drawings of a Celebes ape 'in placid condition' and 'when pleased by being caressed' were made for Darwin by the illustrator Joseph Wood and reproduced in *Expression*. Darwin wrote instructions for the engraver on the back.

***Cynopithecus niger* drawn by Joseph Wood with placid and pleased expressions, 1871 - 79**
DAR 53.1: C163

The publication of *Descent of Man* sparked a flurry of caricatures of Darwin, many of which he collected.

George Montbard was the pseudonym of Charles Auguste Loye, a French artist who fled to England following the Paris Commune uprising in 1871, the year in which Darwin published *Descent.* This original watercolour appears never to have been published and may have been given to Darwin by the artist.

Watercolour caricature of Charles Darwin in the 'Gallery of Ancestors', George Montbard (1841–1905), England?, c. 1871
DAR 225: 178

Case

Three cheers for our great ancestor!

Thomas Huxley often decorated his letters with irreverent sketches. This whimsical evolutionary progression, culminating with a well-dressed woman, starts with *Amphioxus* (the lancelet), a marine invertebrate that Darwin suspected might offer a clue to the ancestry of vertebrates. Just when and how vertebrates had evolved remained a hot topic to the end of Darwin's life.

1 **Letter from Thomas Huxley, 8 December 1874**
DAR 103: 234–5

Darwin used his global correspondence network to distribute a survey on emotional expression. He was looking for evidence that human expression is universal. Responses came from Australia, New Zealand, Malaysia, China, India, Sri Lanka, Africa, and North and South America. The response from Christian Ngqika ('Gaika') half-brother of Sandile, paramount chieftain of the Ngqika Xhosa, is the only one from a member of an Indigenous group rather than from European colonists or their descendants. Ngqika's replies were sent through James Mansel Weale, a farmer in Eastern Cape province, who had corresponded with Darwin about orchid pollination.

Charles Darwin in the 'Gallery of Ancestors'.
George Montbard 1871.
DAR 225: 178

2 **Charles Darwin's annotated copy of his 'Expression' queries.**
January–March 1867 DAR 186: 1

3 **Responses to 'Expression' queries by Christian Ngqika enclosed with letter from James Weale, 7 July 1867**
DAR 181: 41

Je sens maintenant que j'aurais dû vous donner la triste nouvelle de la perte de notre fille, notre unique enfant . . . (I now feel that I ought to have given you the sad news of the loss of our daughter, our only child . . .)

The Dutch physiologist Frans Cornelis Donders was taken to lunch at Down by the ophthalmic surgeon William Bowman. Darwin sent him questions in advance about the behaviour of the eye muscles under stress, and the possible origin of crying. Donders apologised for his slow response to Darwin's questions and explained that it was due to the death of his only daughter shortly after giving birth.

The black border indicates that Donders was in mourning. Many letters reflect on death and grief, especially for children. Darwin wrote back, 'I once lost a dear & good girl, & know what a dreadful grief it is . . . Your loss is irreparable, & I feel deeply for you.'

4 **Letter from Frans Donders, 17 May 1870**
DAR 162: 224

I am best capable perhaps & certainly chiefly desirous of making inquiries relative to the human race

(from William Winwood Reade, 19 May 1868)

Darwin used his existing correspondents to expand his international networks. The travel writer William Winwood Reade was recruited by the explorer Henry Bates. Darwin asked Bates to look out for someone to observe aesthetic taste in Indigenous populations. Reade, who was planning an expedition to Ghana and Benin, sent Darwin forty letters in the following four years, and Darwin cited several of his observations in Descent.

5 **Letter from William Reade, 19 May 1868**
DAR 176: 33

Figures 19. & 20. The muscles of the eyebrows are constantly seen in energetic action in cases of melancholia.

James Crichton-Browne ran the 'West Riding Pauper Lunatic Asylum'. He was pulled into Darwin's network when another doctor passed on Darwin's requests for information on emotional expression in patients with mental illnesses. Browne began this long letter by commenting on photographs Darwin had sent him – the same ones Darwin had shown to visitors in 1868. Crichton-Browne also sent copies of patient notes and supplied photographs.

6 **Letter from James Crichton-Browne, 6 June 1870**
DAR 161: 323

What you say abt my helping has pleased me v. m— . . . to have a say so much, & to feel that at any rate you think I can help you so really, is very sweet to me.

Darwin's daughter Henrietta reviewed the manuscript of *Descent* while on holiday abroad. Darwin made her a gift of £50, a huge sum, in recognition of her contribution to the book's 'reasoning'. She shared his pride in it's brisk sale.

Henrietta took an active part in scientific discussions with her father's friends and in this letter critiques the views on animal evolution of both Alfred Russel Wallace and Thomas Henry Huxley.

7

Letter from Henrietta Darwin, 21 March 1871
DAR 275: 44

Darwin Esq | Author of Darwin's Theory of the Human Race

Publication of Descent prompted a flood of letters with unsolicited comment, criticism, and anecdote. This contributed to the substantial number of corrections and expansions in the second edition.

Despite having no address on it, this envelope clearly reached Darwin. We have never found a letter to go with it so do not know who sent it or why they thought the letter important.

DAR 53.1: C90

8

Envelope addressed to 'Author of Darwin's Theory of the Human Race'.
Anonymous. 10 July 1873.
DAR 201: 11

Expression was one of the first popular scientific books to be illustrated using photography. Darwin, helped by his sons William and George, collected photographs and researched emerging technologies for mass reproduction.

The figures on this plate illustrate expressions of 'low spirits, anxiety, grief, dejection, despair'. Figures 1 and 2 are of an actor with his natural expression and 'simulating grief'. They were among the photographs shown to Darwin's visitors in 1868.

Figure 3 is the 'horse-shoe' grief fold 'on the forehead of a young lady'. From Darwin's copy of the complete photograph we know the subject was his niece Effie Wedgwood. It may have been taken by her sister Hope. Both Hope and Effie were photographers. The images have all been reversed by the heliotype reproduction process.

9

Francis Darwin's copy of
***The Expression of the Emotions in Man and Animals*, by Charles Darwin**
London: John Murray, 1872
CCA.24.46

10

Photograph of 'K.E.W.' (Katherine Euphemia (Effie) Wedgwood), top excised.
Annotated on reverse by Charles Darwin: 'Pl II fig 3. The forehead & eyebrows *alone*', 1871 Replaced in September with a facsimile
DAR 53.1: C90

11 **Photograph of Effie Wedgwood, 1871**
Replaced in September with a facsimile
DAR 53:1: C131

It is very difficult to get, at will—those expressions you wish . . . I have tried in propria persona—even cut my moustache shorter to try to please you

(letter from Oscar Rejlander, 30 April 1871)

Darwin was involved in every stage of book production. The photographer Oscar Rejlander supplied him with a collection of photographs, including several of himself portraying particular emotions. Darwin made sketches for their reproduction in *Expression,* with instructions to the printers.

DAR 53.1: C81

12 **Letter from Oscar Rejlander, 30 April 1871**
DAR 176: 115

13 **Oscar Rejlander simulating 'indignation'. Facsimile**
DAR 53.1: C79

14 **Oscar Rejlander simulating 'shrugging'. Facsimile**
DAR 53.1: C81

15 **Darwin's annotated sketch of the layout for *Expression* pl. 6**
DAR 53.1: C144

Vineland, New Jersey,
Dec. 13, 1872.

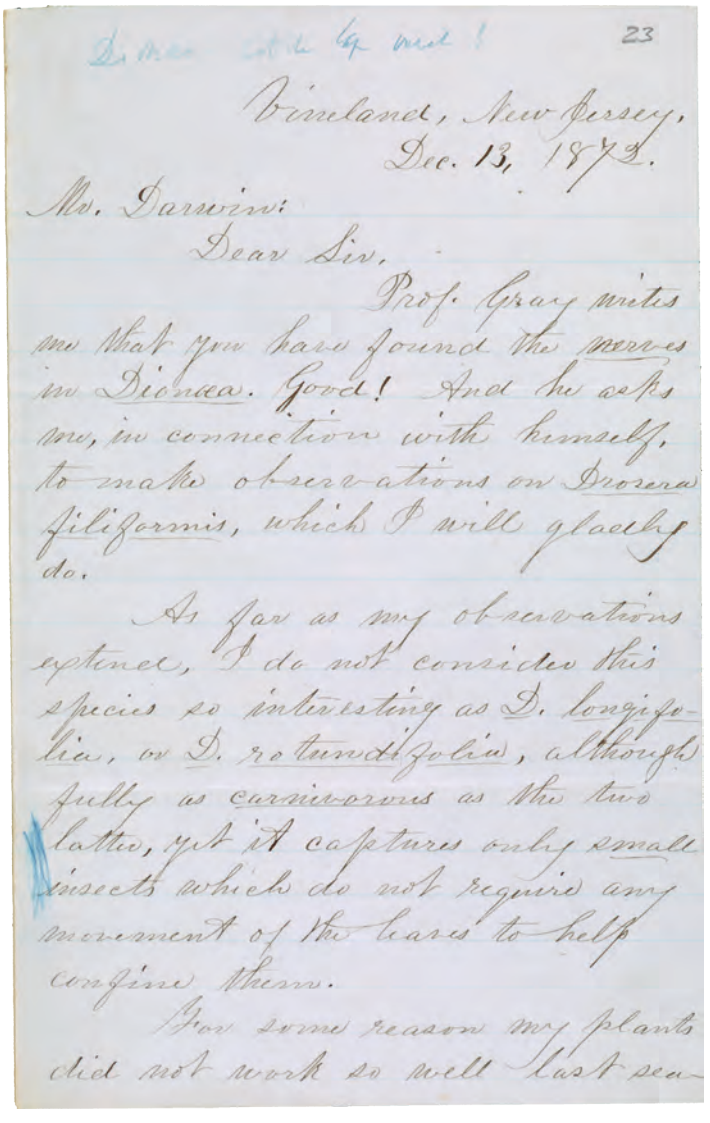
Mr. Darwin:

Dear Sir,

Prof. Gray writes me that you have found the nerves in Dionæa. Good! And he asks me, in connection with himself, to make observations on Drosera filiformis, which I will gladly do.
As far as my observations extend, I do not consider this species so interesting as D. longifolia, or D. rotundifolia, although fully as carnivorous as the two latter, yet it captures only small insects which do not require any movement of the leaves to help confine them.
For some reason my plants did not work so well last season as the year before. Whether they were weakened by the unusually dry spring, or whether the locality from which I obtained them was not so good, or whether the fault may not have been somewhat with myself, I cannot say. For two months, commencing in early summer, almost my whole time and thought were concentrated on butterflies in the effort to control sex. The result of my experiments will appear in the American Naturalist.
My observations and experiments with butterflies, lead me to think that the theory of the Hive bee is not correct. I know that I shall meet with opposition, so the only way is to experiment. I have already engaged a Langstroth observing hive for rearing queens, and shall carry on these observations, as well as continue my experiments with butterflies the coming season.
Your theory is steadily gaining ground among the masses and thinking people of this country, Prof. Agassiz to the contrary notwithstanding. It is boldly advocated from an Orthodox pulpit in this place, and from the Unitarian pulpit we have had a series of discourses teaching the people your theory. Nothing brings out a crowd on Sunday, like the announcement that Darwinism is to be the theme. Surely the world moves!
Command me in whatever way you may wish observations made, on birds, insects, or plants, and I shall only be too glad to render assistance as far as in my power.
Accept my thanks for your courteous reply to my former letter, and believe me

| Yours most sincerely, |

Mary Treat.


23

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For some reason my plants did not work so well last sea-

Plant or animal?

'it is a wonderful plant, or rather a most sagacious animal'

(to Asa Gray, 4 August [1863], on the sundew (*Drosera*))

Unlike some contemporaries Darwin did not see the division between plants and animals as absolute. He was interested in continuities. Did plants have a nervous system? Were the digestive secretions of earthworms and insectivorous plants the same? How had plants adapted to climb? To fold up their leaves and 'sleep'? To catch prey?

Darwin's interest in the mental and physical abilities of earthworms dated back to the 1830s. In the early 1860s, ill and sometimes bored, he took up two new 'hobby-horses': he was curious about the twining tendrils of plants on his sick-room windowsill, and about the insect-covered sticky leaves of sundews observed on holiday walks.

In his final decade Darwin returned to these questions, publishing *Insectivorous Plants* in 1874, *The Power of Movement in Plants* in 1880, and *The Formation of Vegetable Mould, through the Action of Worms, (Earthworms)* in 1881. The wild enthusiasm in his letters show what none of these books do - that he also had fun.

Case

Darwin was interested in whether substances that are poisonous to animals would also affect movement in plants such as sundews. As well as experimenting with strychnine, hemlock, and opium, he tried chloroform, nitric ether, sulphuric ether, alcohol, carbonic acid, and turpentine. He had a surprising number of poisons at home, but others, such as cobra poison, he had to beg from contacts in laboratories.

1 **Charles and Francis Darwin's notes on the action of cobra poison on *Drosera* (sundew). 1874**
DAR 57: 93

2 **Darwin's experimental notes on the action of various poisons on the movement of tentacles in *Drosera*. n.d. DAR 60.2: 88v**

George Darwin's drawings of sundews and a Venus fly-trap used to illustrate *Insectivorous Plants*. The annotations are his father's, including instructions for alterations.

3 **Sketches, ink and pencil, by George Darwin. [1874 - 75]**
DAR 190: 1 - 2, 190: 4, 190: 9

I asked the daughter of the Hôtel whether they used Pinguicula for making cheese, but she said not & thought us amiable maniacs

Francis and Amy Darwin sent this letter with observations on the insectivorous plant butterwort *(Pinguicula)* from their honeymoon in Switzerland. They signed themselves 'Your affectionate secretaries'.

Francis assisted his father from 1874 and spent several summers in laboratories in Würzburg and Strasbourg. Darwin tapped into the expertise of both establishments. His research in his last years, including much that is unpublished, is well documented through their letters.

4 **Letter from Francis and Amy Darwin, 8 August [1874] DAR 58.1: 139 - 40**

Dr B. Sanderson on Digestion of Mucin Globulin &c with Hydrochloric Acid

Darwin co-opted specialists who could perform experiments requiring equipment or materials that he could not get. The physiologist John Burdon Sanderson ran the University of London's Brown veterinary research laboratory, where Darwin's son Francis had studied. Darwin was the first person to demonstrate that plants not only caught insects but could digest them. He asked Sanderson to compare digestion in plants and in artificial animal stomachs.

Sanderson also conducted electrical experiments for Darwin on Venus fly-trap *(Dionaea)* to test whether it had a nerve-like structure.

Flowering stem of *Utricularia inflata*.
DAR 226.2: 160 (detail)

5 6 **Results of experiments on digestion from John Sanderson, 30 March [1874] DAR 58.2: 64r and associated envelope with Darwin's annotations DAR 58.1: 59**

Prof. Gray writes me that you have found the nerves in Dionæa. Good!

The New Jersey naturalist and evolutionist Mary Treat helped Darwin alongside her own investigations on plants and insects, which like his were carried on largely at home. He admired her pioneering experiments on the effects of nutrition on the sex of butterflies.

Treat had heard from Gray of Darwin's teasing claim to have traced 'nerves!!!' in Venus fly-trap *(Dionaea)*.

7 **Letter from Mary Treat, 13 December 1872**
DAR 58.1: 23 - 4

Mr. Darwin says the valve is not the least irritable . . . But we have seen in the instances of the mosquito and chironomus larvae that this is not the case . . .

Treat established that insect larvae touching the valve of the bladders in the aquatic insectivorous plant *Utricularia* (bladderwort) triggered them to open; the insects were sucked inside by the partial vacuum. Her conclusion, which contradicted Darwin's, arrived too late to be included in *Insectivorous Plants*. Francis Darwin added it to the second edition, published after his father's death.

8 ***Is the valve of Utricularia sensitive?* by Mary Treat, *Harper's New Monthly Magazine* 52, pp. 382 - 7, 1876**
DAR 226.2: 160 - 62

My whole soul is absorbed with worms just at present!

(to William Thiselton-Dyer, 23 November [1880])

Earthworms was Darwin's last – and most immediately successful book. He proved that worms could raise the level of the ground and condition the soil, and he opened debates on the origins of intelligence.

I had fully intended sending you some notes on the worm casts (enclosed in a Kew case) shortly after their despatch . . .

Darwin had helped get the working-class gardener John Scott his job in the Calcutta (Kolkata) Botanic Garden. Scott had previously been dismissed from the Edinburgh Botanic Garden for spending too much time helping Darwin with experiments. Darwin continued asking him for information on all sorts of subjects.

Darwin had been surprised to receive an unlabelled box of worms and worm casts sent by Scott via Kew Gardens.

9 **Letter from John Scott, 25 September 1872**
DAR 177: 121

. . . worms seem to lift some of the tesseræ completely out of their places.

The archaeologist James Joyce excavated the Roman town at Silchester, Hampshire. He helped Francis and Horace investigate earthworm activity at the site for their father. Darwin concluded that worms had played a large part in burying historic ruins. Horace, co-founder of the Cambridge Scientific Instruments Company, designed a 'worm-stone' for Darwin's garden to test the rate at which the soil was moved.

10

Section drawings, 'N. End of the Basilica', 'centre of the Basilica', from memorandum on Silchester enclosed with letter from James Joyce, 15 November 1877
DAR 65: 108

Replaced from October with section drawings, 'Basilica', 'Block II', and 'floor in Block I' from memorandum on Silchester enclosed with letter from James Joyce, 15 November 1877
DAR 65: 104

This photograph of Darwin's study at Down House was probably taken shortly after his death in 1882.

Photograph [May - August 1882] DAR 225: 2

The Darwin Correspondence Project – A History.

By the Editors

In 1974 an American scholar Frederick Burkhardt, Chairman of the Board of Trustees of New York Public Library, and recently retired President of the American Council of Learned Societies, embarked on what became a lifelong commitment. Together with his wife, Anne Schlabach Burkhardt, and Sydney Smith, a Cambridge University zoologist, he set out to publish all of Charles Darwin's correspondence. Fred died in 2007.

The Darwin Correspondence Project has remained an Anglo-American collaboration. Since 1975 the UK team has been based in Cambridge University Library, home to the largest single collection of Darwin's manuscripts, and to his own working library. Most of the US team were volunteers working out of Fred and Anne's home in Bennington, Vermont, supplemented between 2009 and 2013 by a group of researchers based at Harvard.

The first volume of *The Correspondence of Charles Darwin* was not published until 1985. The novel decision was made to include all letters written to Darwin as well as those written by him, and to publish the full texts in chronological order. A systematic worldwide search had located a further 4000 letters in addition to the 9000 in Cambridge. As fewer than half were fully dated the first task was to assign provisional dating in order to publish a print Calendar of the whole corpus. In a prescient move, the letters were digitised to help sorting. This delayed publication and began what Fred called 'the computer nightmare', but resulted in the creation of the extensive electronic archive that enabled the editorial work for the print edition, and now underpins a whole suite of publicly available electronic resources used by researchers, educators, and readers worldwide.

Today we know of more than 15,000 letters exchanged by Darwin with nearly 2000 correspondents between 1821 and his death in 1882. The thirtieth and final volume of the print edition of *The Correspondence of Charles Darwin* goes to press in 2022.

(We did it Fred!)

Curated by **Alison Pearn, Francis Neary** and **Sally Stafford**
Conservation by **CUL's Conservation and Collection Care team**
led by **Anna Johnson** and **Rachel Sawicki**
Exhibition coordination by **Ruth Law**
Photography by **CUL's Digital Content Unit**

Exhibition design by **Skellon Studio / Seeing Things**
Graphic production by **Displayways**
Exhibition build by **MER**
AV and interactive content by **Surface Impression**
Lighting by **Lux Lucis**

This exhibition draws on the work of past and present editors of the Darwin Correspondence Project, founded by Frederick Burkhardt.
www.darwinproject.ac.uk

The Darwin Correspondence Project is jointly managed by the American Council of Learned Societies and Cambridge University Library.
It has been made possible by generous funding from the following institutions:

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The Arts and Humanities Research Council
The British Academy
The Evolution Education Trust
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The Isaac Newton Trust
The John Templeton Foundation
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The Parasol Foundation
The Royal Society of London
Stifterverband für die Deutsche Wissenschaft
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We are also deeply grateful to a number of private donors

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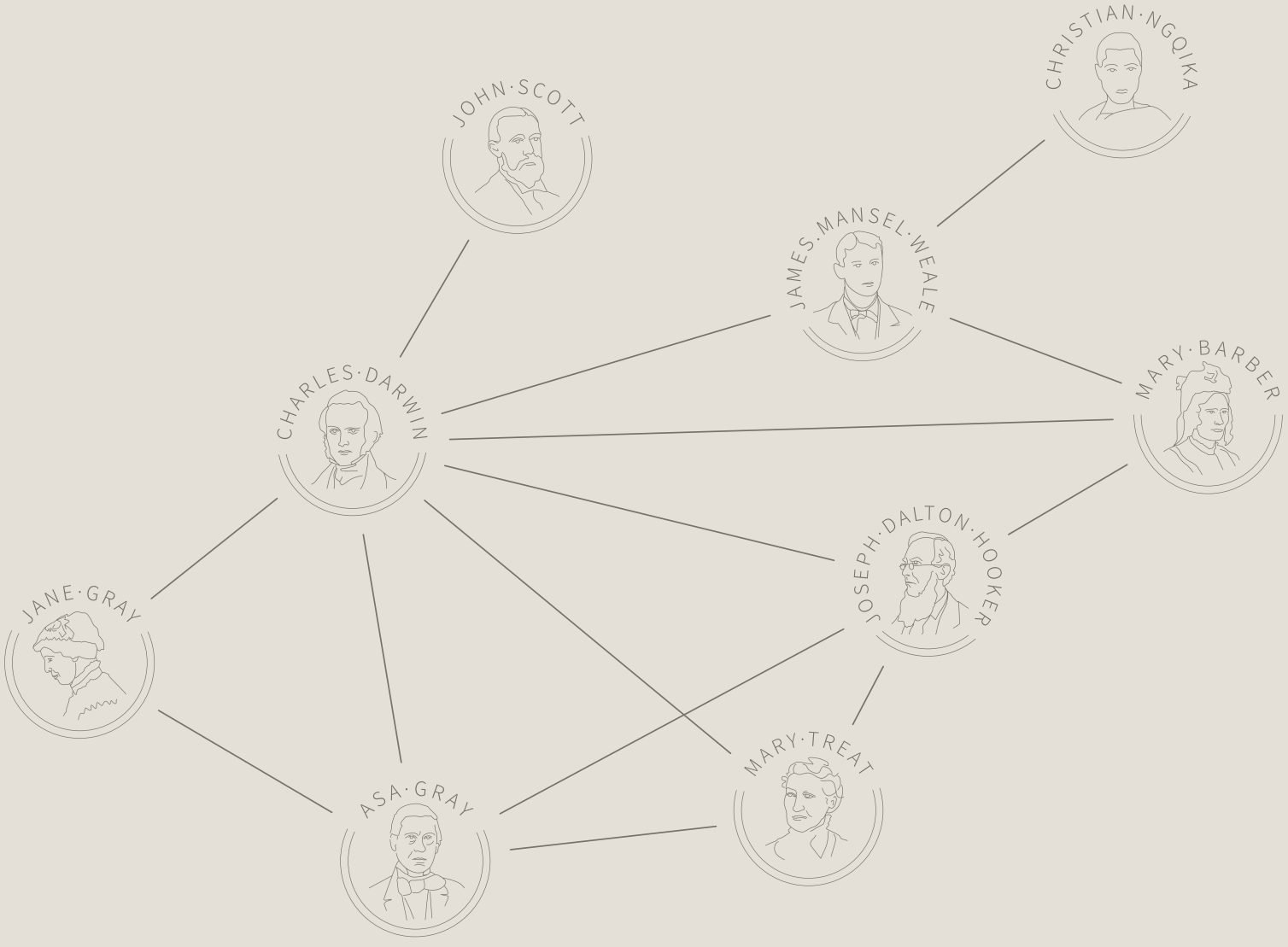

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