THE CORRESPONDENCE OF CHARLES DARWIN

Editors

FREDERICK BURKHARDT† JAMES A. SECORD

SAMANTHA EVANS SHELLEY INNES
FRANCIS NEARY ALISON M. PEARN
ANNE SECORD PAUL WHITE

Associate Editors

ANNE SCHLABACH BURKHARDT†

ROSEMARY CLARKSON
ANDREW CORRIGAN
AMPARO GIMENO-SANJUAN
MICHAEL HAWKINS
ELIZABETH SMITH

RUTH GOLDSTONE
MURIEL PALMER

This edition of the Correspondence of Charles Darwin is sponsored by the American Council of Learned Societies. Its preparation is made possible by the co-operation of Cambridge University Library and the American Philosophical Society.

Support for editing has been received from the Alfred P. Sloan Foundation, the Andrew W. Mellon Foundation, the Arts and Humanities Research Council, the British Academy, the British Ecological Society, the Evolution Education Trust, the Isaac Newton Trust, the John Templeton Foundation, the National Endowment for the Humanities, the National Science Foundation, the Natural Environment Research Council, the Royal Society of London, the Stifterverband für die Deutsche Wissenschaft, and the Wellcome Trust. The National Endowment for the Humanities funding of the work was under grants nos. RE-23166-75-513, RE-27067-77-1359, RE-0082-80-1628, RE-20166-82, RE-20480-85, RE-20764-89, RE-20913-91, RE-21097-93, RE-21282-95, RZ-20018-97, RZ-20393-99, RZ-20849-02, and RQ-50388-09; the National Science Foundation funding of the work was under grants nos. SOC-75-15840, SOC-76-82775, SES-7912492, SES-8517189, SBR-9020874, SBR-9616619, SES-0135528, SES-0646230, and SES-0957520. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the editors and do not necessarily reflect the views of the grantors.

THE CORRESPONDENCE OF CHARLES DARWIN

VOLUME 26 1878

CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi – 110025, India

79 Anson Road, #06-04/06, Singapore 079906

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781108475402
DOI: 10.1017/9781108566940

First published 2018

Citation:
Burkhardt, Frederick, *et al.*, eds. 2018. *The correspondence of Charles Darwin.* Vol. 26. Cambridge: Cambridge University Press.

Printed in the United Kingdom by TJ International Ltd. Padstow Cornwall

A catalogue record for this publication is available from the British Library

ISBN 978-1-108-47540-2 Hardback

Dedicated to
the Wellcome Trust
for its essential support
of
the Darwin Correspondence Project
1996–2006

The completion of this edition has been made possible through the generosity of the Evolution Education Trust together with the Alfred P. Sloan Foundation, the Andrew W. Mellon Foundation, and the Isaac Newton Trust.

The Darwin Correspondence Project also gratefully acknowledges the essential long-term support for the edition provided by the British Academy, the National Endowment for the Humanities, the National Science Foundation, the Royal Society, and the Wellcome Trust, and by the following donors:

Patrons

The Evolution Education Trust
Golden Family Foundation
The Parasol Foundation Trust
Jim and Hilary Potter

Affiliates

Bern Dibner†
William T. Golden†
Kathleen Smith†

Friends

Jane Burkhardt
Pamela Davis
Florence Fearrington and James Needham†
Gerald† and Sue Friedman
John C. Greene
Daniel V. Grossman and Elizabeth Scott Andrews
Lawrence K. Grossman
Shirley Grossman, M.D.
Mary S. Hopkins
Robert McNeil
Michael Mathews
Victor Niederhoffer
Wendy L. Thompson
Daniel J. Wright

CONTENTS

ILLUSTRATIONS

CALENDAR LIST OF LETTERS

The following list is in the order of the entries in the *Calendar of the correspondence of Charles Darwin*. It includes all those letters that are listed in the *Calendar* for the year 1878, and those that have been redated into 1878. Alongside the *Calendar* numbers are the corrected dates of each letter. A date or comment printed in italic type indicates that the letter has been omitted from this volume.

Letters acquired after the publication of the first edition of the *Calendar*, in 1985, have been given numbers corresponding to the chronological ordering of the original *Calendar* listing with the addition of an alphabetical marker. Many of these letters are summarised in a 'Supplement' to a new edition of the *Calendar* (Cambridge University Press, 1994). The markers 'f', 'g', and 'h' denote letters acquired after the second edition of the *Calendar* went to press in 1994.

5825. [before 3 Feb 1878]
6307a. 6 Aug [1878]
7842. July 1878
9632f. *Cancelled: enclosure to letter 10594, to be published in a future supplement.*
9863f. 19 and 21 Feb [1878]
10077. 18 Jan 1878
10173. 25 Sept [1878]
10234f. *1 Nov [1877–9]. To be published in a future supplement.*
10332. [*c.* 31 Jan 1878?]
10827. [before 12 Feb 1878]
10832. 6 Feb [1878]
10929. 15 Apr [1878]
10944. 28 Apr [1878]
11153. 27 Sept [1878]
11219. *c.* 20 Feb 1878
11220. [*c.* 20 Feb 1878]
11301. *[July 1875 – 1878?]. To be published in a future supplement.*
11302. [1878?]
11302f. *[28 Oct 1877?]*
11303. 5 [June 1878]
11304. [Jan 1878]
11305. 1 Jan [1878]
11306. 1 Jan 1878
11307. 1 Jan [1878]
11308. 2 Jan [1878]
11308a. 2 Jan 1878
11309. 3 Jan 1878
11309f. 3 Jan 1878
11310. 3 Jan 1878
11310f. *Cancelled: same as 5984f, to be published in a future supplement.*
11311. 4 Jan 1878
11311f. 4 Jan 1878
11312. 5 Jan 1878
11312a. *[20–9 Dec 1877]*
11313. *[1842–82]. To be published in a future supplement.*
11314. 6 Jan [1878]
11315. 7 Jan 1878
11316. 7 Jan 1878
11317. 8 Jan 1878
11318. 11 Jan [1878]
11319. 12 Jan 1878
11320. 12 Jan 1878
11321. 16 Jan 1878
11321a. 16 Jan 1878
11322. 17 [Jan 1878]
11323. 18 Jan 1878
11324. 18 Jan 1878
11325. *Cancelled: not a CD letter.*
11326. 19 Jan 1878
11327. 19 Jan 1878

INTRODUCTION

In 1878, Darwin devoted most of his attention to the movements of plants. He investigated the growth pattern of roots and shoots, studying the function of specific organs in this process. Working closely with his son Francis, Darwin devised a series of experiments to trace these subtle movements over long periods of time, often using household materials. Francis spent an extended period in Würzburg at Julius Sachs's botanical institute, one of most advanced plant laboratories in Europe. While Francis was away, Darwin delighted in his role as grandfather to Francis's son Bernard, occasionally comparing the mental faculties of the two-year-old with those of a monkey. Another diversion from botanical research was provided by potatoes, as Darwin took up the cause of an Irish businessman who hoped to produce a disease-resistant variety that would rid Ireland of famine. Several correspondents pressed Darwin for his views on religion, selective breeding for human improvement, and the role of natural selection as an agent of progress. The year closed with remarkable news of a large legacy bequeathed to Darwin by a stranger as a reward for his lifetime of dedication to science. 'This is the oddest thing that ever happened to me', he remarked to Joseph Dalton Hooker, 'or as far as I know any scientific man' (letter to J. D. Hooker, 14 December [1878]).

Writing to Ernst Haeckel on his sixty-ninth birthday (letter to Ernst Haeckel, 12 February [1878]), Darwin reflected that it was 'more prudent', given his age, 'not to attempt to write on large & difficult subjects', but to focus instead on 'small special points.' 'To you & others', he added, 'must be left the extending & fortifying the principles of Evolution'. After completing his two big books on human evolution (*Descent* and *Expression*), and the final revision of *Origin* (1872), Darwin had turned almost exclusively to botanical observation and experiment. He had begun a systematic study of plant movement in 1877, concentrating on the motion of leaves in response to changes in light, moisture, and other conditions. He continued to study the phenomena of 'sleep', concluding that the vertical position assumed by leaves at night (nyctitropism) was a protection against heat loss. 'I think we have proved that the sleep of plants is to lessen injury to leaves from radiation', he wrote to Hooker on 25 March; 'this has interested me much & has cost us great labour, as it has been a problem since the time of Linnæus. But we have killed or badly injured a multitude of plants.'

In the spring of 1878, Darwin started to focus on the first shoots and leaves of young plants. 'I shall die a miserable, disgraced man if I do not observe a seedling

Cactus', he wrote to William Turner Thiselton-Dyer on 9 May. He later noted that in many Cacteae the cotyledons (the embryonic leaves in seedlings) were rudimentary, but probably served to protect the plumule (young shoot) when it broke through the soil in the shape of an arch (*Movement in plants*, pp. 96–7). As usual, staff at the Royal Botanical Gardens, Kew, were enrolled as researchers, as were family members. Darwin asked his niece Sophy to observe the arching shoots of *Neottia* (bird's nest orchid) near her home in Surrey: 'If you could find some just springing up, you wd be able to see whether the young flower-stems break through the ground straight or arched.… Almost all seedlings come up arched' (letter to Sophy Wedgwood, 24 March [1878–80]). While Darwin was studying the function of cotyledons, he began to examine another structure at the base of the leaf-stalk: the pulvinus, a cellular mass present in some plants that expands first on one side, then another, to produce movement in the stalk. Darwin compared adult and young leaves to determine how much movement could be attributed to this specialised bending organ rather than to circumnutation (see *Movement in plants*, pp. 112–13). He explained to Francis on 2 July: 'I go on maundering about the pulvinus, cushion or gland whichever you call it, & from what I have seen roughly in the petioles of the Cotyledons of oxalis, I conclude that a pulvinus must be developed from ordinary cells, which secrete water into the inter-cellular spaces on the concave side of a bending organ; & that a pulvinus is developed only when the bending has to be continued for a period after growth has ceased or nearly ceased.'

Finally, Darwin turned to plant motion below the ground, beginning with the protrusion of the embryonic root or radicle from the seed. He found that it tended downwards (geotropism) in a spiral unless it met with strong resistance. Experiments with card showed that the tip or apex was sensitive, and bent away from obstacles. 'I cannot resist telling you a little about the radicles', he wrote to Thiselton-Dyer on 9 May. 'The apex is sensitive, & instead of turning to touching object like a tendril, it turns from it. The apex is so sensitive that if little squares (about 4th of inch) of card & thin paper of exactly same size are fixed to opposite sides of apex, the radicle, (growing freely downward in damp air) bends always from the card side.— The apex of a radicle growing in earth tries to circumnutate, & thus prefers the earth on all sides; if one side is harder than the other the radicle will bend from this side, & thus it will discover with unerring precision the lines of least resistance in the ground.' Darwin would devote a whole chapter to the sensitivity of the apex in *Movement in plants*. This was a point on which he disagreed with Sachs, who, in a paper on the growth of roots, had dismissed earlier findings about the apex made by Theophil Ciesielski as due to methodological error. 'Will you send to Down, as soon as you can spare it, the Part on Radicles by Sachs which you have, for I have read the other two Parts.— It is a magnificent piece of work. He will swear & curse when he finds out that he missed sensitiveness of apex' (letter to Francis Darwin, [11 May 1878]).

Having found plants responsive to touch, light, heat, moisture, and various chemical and nutritive substances, Darwin next considered sound. He explained to John

Tyndall on 4 December: 'The day before yesterday & today I observed (but perhaps the observation will prove erroneous) that certain sensitive plants were excited into movement, by a prolonged note on the bassoon & apparently more by a high than a low note.' Francis apparently played the musical instrument to various plants. To confirm the results, Darwin borrowed a siren from Tyndall, who had investigated the physics of sound, but the piercing blast had no effect. 'The plants, ill-luck to them, are not sensitive to aerial vibrations', Darwin complained. 'I am ashamed at my blunder' (letter to John Tyndall, 22 December [1878]).

Darwin's experiments on plant movement were intensely collaborative, with Francis playing a more active role than ever. The closeness of father and son is evident from the detail and frequency of letters exchanged when they were apart. At the start of June, Francis left to work at Sach's laboratory in Germany, not returning until 8 August. 'Alas Frank is off tomorrow to Wurzburg,' Darwin wrote to Thiselton-Dyer on 2 June, '& work by myself will be dull work.' Several weeks later he reported: 'Frank seems getting on well … & is working away at physiology & at the accursed German language: Sachs is very kind to him' (letter to W. T. Thiselton-Dyer, 18 June [1878]). While Francis was away, Darwin sent regular reports about their plants, and longed for conversation: 'Porliera went beautifully to sleep in my study & awoke well early in the back … of my study … & has kept awake all day.… Good bye, as I have nobody to talk to, about my work, I scribble to you (letter to Francis Darwin, 7 [July 1878]). Two weeks later he wrote: 'I have been speculating roughly & trying to get a heap of cases under one sort of rule, but it is horrid not having you to discuss it with' (letter to Francis Darwin, 20 [July 1878]).

It is unclear why the decision was made for Francis to go abroad, but students and researchers from Britain and other countries often spent time in German laboratories as part of their training. Sachs had worked on plant movement, including heliotropism and geotropism, and had built an international reputation through his textbooks and extensive publications. His institute in Würzburg was one of the leading centres of botanical research in Europe. Sachs supervised the work of doctoral and post-doctoral students, often assigning highly specialised topics and dictating experimental method and design. Francis seems to have been allowed to work more independently, but Sachs offered frequent comments and suggestions. Asked by his father to measure the diameter of the pulvini cells of oats to determine whether they had chlorophyll, Francis reported (letter from Francis Darwin, [after 7 July 1878]): 'The oats have only just begun to germinate.… Sachs made a calculation & said that at the most the little tip that appears at first could only manufacture … $\frac{6}{1000}$ of a milligramm dry weight in a day.… Germinating seeds do not gain in weight he says.' The laboratory was equipped with the latest precision instruments, allowing for levels of exactitude that could not easily be obtained at Down House, but Francis thought Horace's abilities were a match for German instrument makers. 'There is one machine we must have', Francis wrote (letter from Francis Darwin, [before 17 July 1878]), 'a strong horizontal axis about 2 feet long which goes round by clock work slowly so that geotropism is quite excluded.

We will get Jemmy to design one, the one here is far from well made.' (Jemmy or Jim was Horace's nickname.)

Francis was occasionally struck by Sachs's presumptuousness: 'He seems to me to jump to conclusions rather' (letter from Francis Darwin, [before 3 August 1878]). One day Francis observed that the leaves of a potted *Porliera* were wide open, while those in a bedded specimen were shut. 'Sachs on theoretical grounds says the one in the bed gets more water, but I asked the gardener privately & he on practical grounds says he waters the pot-plant every day & never the bedded out one' (letter from Francis Darwin, [after 7 July 1878]). Sachs's confidence was apparently matched by his tendency to dismiss work that contradicted his own. Darwin asked Francis to test the results of the Polish botanist Theophil Ciesielski, who had studied the response of radicles to moisture, reaching different conclusions from those of Sachs. 'I have borrowed Cieselski & read him,' he reported (letter from Francis Darwin, [22 June 1878]). 'Sachs doesn't consider that there is any puzzle as to how the difference between their results arose.… Sachs doesn't think much of him'. On hearing that Sachs was also dismissive of work by Hugo de Vries and Julius Wiesner on the causes of plant movement, Darwin wrote on 25 July, 'I am sorry Sachs is so severe on men, as that is a character which I dislike'. Despite this autocratic style, Sachs seems to have been a very supportive mentor to Francis and even extended a kind of paternal care when he was unwell. 'I was rather seedy last night & didn't appear at the laboratory & this morning Sachs came all the way to see how I was, & drove me to the Labor in his drosky, & was very kind wanting to send me books & red-wine which is here the cure for all evils' (letter from Francis Darwin, [24 and 25 July 1878]).

While Francis was away, his 2-year-old son Bernard was looked after at Down by a nurse, Mary Anne Westwood, and the proud grandparents. Many of Darwin's letters conveyed news of the boy. 'All the family are here & all adoring Bernard', he wrote to Francis on 7 July. 'Bernard is very sweet & pretty,' he added a week later (letter to Francis Darwin, 14 July [1878]). Darwin had of course observed his own children from infancy as part of his interest in the evolution of mental and moral faculties. He seemed to take special note of the child's use of language and power of judgment. 'Bernard gets more & more charming: he rebuked me sternly yesterday, because I said he was going in a booboo, whereas I ought to have said a gee-gee' (letter to Francis Darwin, 17 July [1878]). On 12 September, Darwin wrote: 'Bernard is as sweet as sugar, but very contradictory. It grew wonderfully dark about half an hour ago; so I said "how dark it is"; so he shouted out "oh no".— I then added I think it will soon rain, & he again shouted out "oh dear no" "oh dear no"'. Darwin shared some of his observations with George John Romanes, who was engaged in his own research on animal instinct and intelligence. 'Frank's son, nearly 2 years old (& we think much of his intellect!!) is very fond of looking through my pocket lens, & I have quite in vain endeavoured to teach him not to put the glass close down on the object, but he will always do so' (letter to G. J. Romanes, 20 August [1878]). Darwin remarked that a monkey possessed the same fascination with the eyeglass,

but was able to focus the device more expertly. 'I conclude that a child—just under 2 years is inferior in intellect to a monkey.' 'Have you ever thought of keeping a young monkey, so as to observe its mind'? Darwin's suggestion was seconded: 'Frank says you ought to keep an idiot, a deaf-mute, a monkey & a baby in your house!' (letter to G. J. Romanes, 2 September [1878]).

More remarkable cases of animal intelligence were observed by Darwin's correspondents. The German stamp-collector Alfred Moschkau reported on 26 March that a starling in Saxony was able to impersonate a famous Austrian general: 'Who are you?' the bird was asked. 'I am General Radezky', it replied. 'How old? I am seventy years old. Were you brave? Very, very brave!' The creature could also whistle a folk song. 'This bird was a real showpiece', Moschkau concluded, but it was sold to a vicar and 'after 3 months his cat ate it.' Darwin also learned of a South American parakeet (*Conurus guianensis*) with extraordinary table manners. According to the banker and naturalist Robert Middleton, who wrote on 22 October, the bird 'invariably restrained himself in [his evacuations] while being handled or when sitting on the head or dress of any person, & … when being fed on the dining-table, he would always back to the edge of the table, & sometimes almost overbalance himself, in his effort to save the table-cover or cloth from defilement.' Darwin had lengthy notes on animal instinct that he had originally intended for his 'big book' on species (published in 1975 under the title *Natural selection*), but he gladly turned them over to Romanes, who was delighted, and eventually published them in his 1882 book *Animal intelligence*. 'Like the bees, you ought to have some one to take the honey, when you make it to give to the world—not, however, that I want to play the part of a thieving wasp' (letter from G. J. Romanes, 21 June 1878).

In August, Darwin learned that, after rejecting him five times in succession, the Académie des sciences in Paris had finally elected him a corresponding member, but in the botany section rather than zoology, where his work had been more controversial (letter from J.-B. Dumas and Joseph Bertrand, 5 August 1878). Despite his many botanical publications, Darwin always regarded himself as an outsider to the field because he had never done the taxonomic work that was regarded as fundamental to expertise. 'It is funny', he wrote to Huxley on 11 August, 'the Academy having elected a man as Corr member in Botany, who does not know the characters of a single natural order!' Darwin was rarely concerned about formal honours, and occasionally embarrassed by them. Congratulated by an old Shrewsbury friend for the doctorate he received from Cambridge the previous November, Darwin replied, 'Pray do not call me Dr Darwin, the title seems to me quite ridiculous' (letter to John Price, 2 April [1878]). When a wealthy businessman tried to commission a Royal Academy sculptor (Henry Pinker) to make a bust of Darwin for the Royal Institution, Darwin wanted to decline but worried about offending the patron. 'I hate the fatigue & loss of time from sitting; & yet it seems so ungracious to refuse,' he wrote to William Spottiswoode on 7 July. Pinker later made a statue of Darwin for the Oxford Museum of Natural History; he used a photograph, so Darwin was spared the trouble of sitting.

A younger generation of naturalists continued to find Darwin's work inspiring. The geologist Sydney Skertchly confessed on 27 February: 'by the time I was thirteen your 'Origin of Species' was almost known by heart … and your other works have been my models both for method, and for the true caution and boldness they evince.' 'How all-powerful has been your influence over me.' Darwin was 'deeply gratified', remarking to Skertchly on 2 March: 'It is the greatest possible satisfaction to a man nearly at the close of his career to believe that he has aided or stimulated an able and energetic fellow worker in the noble cause of Science.' An Austrian geologist sent his recent work on coral reefs of the Triassic period: 'I tried to show the way, which the paleontological-geological inquiry has to go, in the mind of your theory, and to elucidate the true nature of the "imperfection of the Geological Record"' (letter from Edmund Mojsisovics von Mojsvár, 28 April 1878). 'What a wonderful change in the future of geological chronology you indicate,' Darwin replied on 1 June, 'by assuming the descent-theory to be established'. The Swiss botanist Arnold Dodel-Port announced on 12 June 1878 the first issue of an atlas with large lithographs intended for teaching physiological botany: 'Without you and your all-enriching science our atlas would not have come together' (letter from Arnold Dodel-Port, 18 June 1878).

In countries where evolution was regarded with suspicion, Darwin became an example of freedom from political or religious prejudice. An engineer in Bohemia addressed his letter to 'the inspired hermit of Down': 'Every thinking man who knows what stands or falls with the idea of the miracle, will praise Darwin as a most noble benefactor of mankind …' 'What I would be without you, I do not know—but it terrifies me, for I see what hundreds and thousands are without you' (letters from Carl Kraus, [31?] January 1878 and 10 February 1878). Darwin learned that his recently published 'Biographical sketch of an infant' had been translated into Greek. Theodor von Heldreich wrote from Athens on 8 February that the translator, a young Cretan doctor, was one of Darwin's 'most zealous admirers & disciples'. 'It is not without some danger & it still requires enough moral courage to espouse and to rally to your principles in this country, which is still under the rule of dogmatism.' In Germany, descent theory was part of a struggle between church and secular institutions for cultural authority. Addressing the German Association of Naturalists in September 1877, Darwin's outspoken supporter Ernst Haeckel championed the teaching of evolution in schools. Haeckel's speech provoked opposition from the eminent physician Rudolf Virchow, whose address 'The liberty of science in the modern state' warned naturalists not to indulge in personal speculation, especially in relation to the theory of descent. 'His address appeared to me very arrogant,' Darwin commented, '& he lectured the best naturalists in Germany, as if they had been school-boys' (letter to Karl von Scherzer, 1 April 1878).

Closer to home, the Anglican clergyman Edward Bouverie Pusey delivered a sermon at Oxford, later published as 'Un-science, not science, adverse to faith', claiming that Darwin had written *Origin* as an attack on religion, replacing a personal god with the 'eternity of matter' (letter from H. N. Ridley, [before 28 November 1878]). Darwin received a copy of the sermon from his old friend, the former vicar

of Down, John Brodie Innes. Darwin and Innes had worked together on village charities for many years and had remained on good terms despite religious differences. Innes now recounted the words he had spoken in Darwin's defence at a recent Church Congress in Dundee: 'I have the pleasure of the intimate friendship of one of the very first Naturalists in Europe … his scrupulous regard for the strictest truth is above that of almost all men I know. … I never saw a word in his writings which was an attack on Religion. He follows his own course as a Naturalist and leaves Moses to take care of himself' (letter from J. B. Innes, 1 December 1878). Darwin did not think the Oxford sermon deserved a reply, but he remarked privately: 'Dr Pusey was mistaken that I wrote the Origin with any relation whatever to Theology … when I was collecting facts for the Origin, my belief in what is called a personal God was as firm as that of Dr Pusey himself, & as to the eternity of matter I have never troubled myself about such insoluble questions' (letter to H. N. Ridley, 28 November 1878).

Darwin was pressed further on religion by a fishing-tackle maker in Scotland: 'I would … be much obliged … if you would … simply tell me if your doctrine of the descent of man destroys the evidence of the existence of a God looked at through nature's phenomena' (letter from James Grant, 6 March 1878). Darwin pleaded that to answer 'would require an essay', but he offered: 'The strongest argument for the existence of God, as it seems to me, is the instinct or intuition which we all (as I suppose) feel that there must have been an intelligent beginner of the Universe; but then comes the doubt and difficulty whether such intuitions are trustworthy.' He added by way of consolation: 'No man who does his duty has anything to fear and may hope for whatever he earnestly desires' (letter to James Grant, 11 March 1878). The question of evolutionary progress was raised by the portrait-painter George Arthur Gaskell, who suggested that natural selection would be superseded by higher evolutionary laws. 'Sympathetic' and 'social selection' would operate through the practice of birth control and selective mating among the healthy and morally fit: 'To those who love children will be left the task of bringing them up … some day a medical certificate may be required, to define the rectitude of adding a new member to society' (letter from G. A. Gaskell, 13 November 1878). Darwin hoped Gaskell was 'in the right' and referred him to recent work by Francis Galton on selective breeding. He still thought that artificial checks on population, such as birth control, were dangerous, however, and praised the spread of British people to other parts of the world: 'Suppose that such checks had been in action during the last 2 or 3 centuries, or even for a shorter time in Britain, what a difference it would have made in the world, when we consider America, Australia New Zealand and S. Africa! No words can exaggerate the importance in my opinion of our colonization for the future history of the world' (letter to G. A. Gaskell, 15 November 1878).

Rarely exercised by politics or religion, Darwin was bothered by criticism that touched on his accuracy as an investigator. He wrote to Asa Gray on 21 and 22 January of recent criticism by the botanist Thomas Meehan, implying that he had ignored the effect of geographical conditions on the fertility of different flower

forms in a species of *Linum*: 'Mr Meehan in a paper lately read before the Philadelphia Soc. says in a somewhat sneering tone that plants behave differently in one country from another … as he speaks of bringing the plant from Colorado, I imagine that it was there endemic … Now if Mr Meehan has mistaken the species it seems to me too bad to throw a slur or doubt on another man's accuracy without taking the smallest pains to be accurate himself.' Darwin considered writing to the Philadelphia Society, but instead took up the matter privately. 'When I read your Article,' he addressed Meehan on 13 May, 'it certainly made me think that you wished indirectly to throw doubt about my observations & I did not like the indirect manner of your doing so. … Such a manner of treating the work of other observers did not appear to me the way to encourage truth.… I shall never think again on the subject, & I hope that you will not do so, except perhaps to make you pause for a few minutes'.

Knowing that Darwin often preferred to engage with critics through correspondence, George asked his father's advice on publicly criticising a paper on geological time recently given at the Royal Society of London by Samuel Haughton. 'If I do write', George worried, 'I'm pretty sure to get in Haughton's ill favour because however civilly I may word it a man can't like to have his work torn to shreds & I don't think I c^{d}. criticize without utterly demolishing it' (letter from G. H. Darwin, 28 January 1878). The matter was complicated by the fact that Haughton, a professor of geology at Trinity College, Dublin, had been highly critical of *Origin* and Darwin regarded him as an 'old and bitter opponent' (*Correspondence* vol. 24, letter to T. C. Eyton, 22 April 1876). 'When I first read your note', Darwin replied on 3 February [1878], 'I thought that you had better not answer & criticise Haughton, as not worth the time; leading to controversy & exciting his ill-will.… I have always acted on the principle of publishing what I believe to be the truth, without contradicting others, thus letting opposed statements fight for existence.— But the case is different, no doubt, with mathematics about which only a few can judge.' Ironically, Darwin himself was later asked to referee a paper by Haughton on the same topic for the Royal Society, and recommended that it not be published because its estimate of geological time seemed 'almost monstrous' (letter to G. G. Stokes, 28 April 1878).

On 24 February, Darwin was contacted by the Irish businessman, James Torbitt, about an ambitious project to cultivate blight-resistant potatoes. Torbitt had invested a substantial sum from his wine and spirit business to raise different varieties on a large scale. In 1876, he had gone so far as to send packets of seeds to every member of Parliament. Darwin had a long-standing interest in the problem, and had experienced the 1845 potato blight that destroyed much of the European crop (see *Correspondence* vol. 3, letter to J. S. Henslow, 28 October [1845]). He was aware of Torbitt's ambitions, having corresponded briefly with Torbitt in previous years. Torbitt now renewed his effort to gain public assistance with a letter to the chancellor of the Exchequer, including extracts from previous letters from Darwin, and sent a copy to Darwin on 24 February requesting permission to publish it. While he was in London, Darwin consulted Thomas Farrer at the Board of Trade, who suggested

that the matter be presented to the duke of Richmond (letter to J. D. Hooker, 28 [February 1878]). Further meetings were held with Farrer and James Caird, a member of the Royal Agricultural Society. Torbitt's credentials as a horticulturist had been questioned by the Agricultural Society's botanist, William Carruthers, and an earlier effort to promote his scheme at the 1874 meeting of the British Association in Belfast had failed. 'I daresay he made a fool of himself at Belfast,' Darwin wrote to Hooker on 3 or 4 March. 'I have often called him "that enthusiastic old fool"—not that I know whether he is old'. But Darwin was clearly impressed by Torbitt's dedication and willingness to spend time and money for the public good. His method of breeding also drew explicitly on Darwin's study of self- and cross-fertilisation, which demonstrated the superior vigour of crossed varieties. Darwin spent over a month corresponding with the various parties, repeatedly revising his own letter of support for Torbitt. 'I send my letter of the sight of which you must be sick', he wrote to Farrer on 13 March 1878. 'Mr. Torbitt's plan … seems to me by far the best that has ever been suggested … raising a vast number of seedlings from cross-fertilized parents, exposing them to infection, destroying all which suffer, saving those which resist best, & repeating the process in successive seminal generations' (enclosure to letter to T. H. Farrer, 7 March 1878). In the end, the attempt to secure public aid was given up. Darwin sent Torbitt a cheque for £100, and advised him to concentrate on experiments instead of publicity: 'If I were in your place … I would work quietly on, till some sure results were obtained. And these would be so valuable that your work in this case would soon be known' (letter to James Torbitt, 4 March 1878).

The potato affair highlighted an issue that Darwin had often complained of: the disregard for science by British government. 'Our governing men are so ignorant of science and so immersed in political squabbles that they will do nothing', he complained to Torbitt on 26 February. Farrer concurred: 'Getting money from the Govt for a new thing is an endless business: and the country will be ruined by spending hundreds of millions on a disastrous war long before we should get hundreds to feed people with potatoes' (letter from Thomas Farrer, 29 March 1878). Farrer alluded to the likelihood of British involvement in the Russo-Turkish War, with the prime minister, Benjamin Disraeli, promoting military intervention to stop Russian advances on Ottoman territory. Darwin usually avoided any engagement in politics, but he was sufficiently exercised to sign and help distribute a letter of protest to the foreign secretary, Robert Arthur Talbot Gascoyne-Cecil (letter to R. A. T. Gascoyne-Cecil, 18 May 1878). The issue of war was raised again in November, as Britain threatened to send troops stationed in India across the border into Afghanistan. Again the action was urged by Disraeli on the grounds that the border was irregular and expensive to defend. Darwin signed a memorial stating: 'Any advance of the present frontier has been condemned by a great majority of the highest civil and military authorities of Indian experience, and appears to be inconsistent with the ordinary principles of justice.… This expenditure, if borne by the United Kingdom, has been and is being made without the consent of Parliament' (memorial to Benjamin Disraeli, [15–18 November 1878]).

Darwin's health, though never good, had been relatively stable for some years. He did make one visit to London at the end of April to see his doctor on account of 'giddiness' ('Journal', Appendix II). His only extended break from scientific work came during visits with family. These now followed a regular pattern, with two or three stays in London at the home of his daughter Henrietta and her husband Richard Litchfield, several weeks in Southampton with William and his wife Sara, and visits to the Wedgwoods at Leith Hill Place, and the Farrers at Abinger Hall, both in Surrey. Darwin typically complained about these periods of enforced idleness. 'My wife is going to take me for 17 days holidays', he wrote to Thiselton-Dyer on 19 July, 'oh Lord how I wish that they were over.' 'I think that I shd die outright', he remarked to Alfred Russel Wallace on 16 September, 'if I had nothing to do.' A recipe for better health was offered by a homeopathic chemist and nephew of the archbishop of Dublin who received 'direct & conscious inspiration from celestials'. The revelation included a prescription for daily doses of platinum, 'osmium', 'indium', guava jelly, and 'a tincture of Rum tox' and honey. In five weeks, Darwin was promised, all his bodily ailments 'would vanish like the chaos before the wind' (letter from T. H. Noyes, 19 November 1878).

The year ended on a surprising note when Darwin was offered a large bequest from a person unknown to him. The benefactor wrote on 7 December: 'I consider that you, more than any man now living, have extended the boundaries of human knowledge, by surpassing genius, long years of persistent labour, unendowed … the first to be remembered should be those whose abilities and exertions have been devoted bravely and boldly and persistently for the benefit of all mankind instead of their own immediate advantage' (letter from Anthony Rich, 7 December 1878). Darwin was shocked by the offer, though he had to agree with the assessment: 'I may say with truth that I have worked at science my whole life, as hard as my health wd permit, & that I have earnestly endeavoured to discover the truth. My work has been my greatest happiness, & I never even dreamt that I shd be rewarded in any other way.' He thought immediately of the advantages the gift would bring to his children, and revealed his ongoing concerns about their health and his pessimism about their future livelihoods: 'I am what may be called a rich man', he replied on 9 December, 'on the other hand I have 5 sons & 2 daughters, & two of my sons suffer from ill-health & will never earn any income, though one of the 2 will do excellent work in astronomy & mathematics; a third son is devoted to natural science & aids me in my work; a 4th son is in the R. Engineers & is getting on well; but it is almost nothing of a profession' (letter to Anthony Rich, 9 December 1878).

Little is known about Anthony Rich other than that he was a graduate of Cambridge, a member of Lincoln's Inn, and an author of a dictionary of Roman and Greek antiquities that went through a number of editions. He had no children or immediate family except an elderly sister. Several months before the offer, Rich had consulted Thomas Henry Huxley about the prospect of making Darwin his heir. 'I gave him the information he wanted,' Huxley wrote on 28 December, 'and, if you will believe it, abstained from pointing out that there was another person to whose

merits & deserts he appeared to be shamefully insensible!' Huxley described Rich as 'an alert, bright-eyed little man with a long beard & croaky voice', adding that he had led 'a loose-ended sort of life', and was 'as pronounced a heretic, theologically morally & politically as I have met with'. Rich was apparently an invalid and rarely left his home in the seaside town of Worthing. He even declined an invitation to Down, offering to play host instead: 'If you ever screw up your courage to the effort of leaving your *tellus* et *domus* [land and home] … need I say what delight it would give me to see you here … installed in the one spare bed room, which my hermitage can boast of' (letter from Anthony Rich, 25 December 1878). The Rich legacy consisted of four freehold houses in central London. Darwin was uncertain of their value, but William assured him of the soundness of London property (letter from W. E. Darwin, 13 December [1878]). 'This is the oddest thing that ever happened to me', Darwin wrote to Hooker on 14 December. Mindful of the lack of government support for science, Hooker hoped that it was a token of better things to come: 'as knowledge increases, so must appreciation of the people & institutions to whom we owe it.—' As a tribute to Rich and his sister, he penned a limerick: 'There was an old couple at Worthing/ Who resolved to reward the deserving,/ And with wise resolution/ Pitched upon Evolution/ That pecunious old couple of Worthing' (letter from J. D. Hooker, 14 December 1878).

ACKNOWLEDGMENTS

The editors are grateful to the late George Pember Darwin and to William Darwin for permission to publish the Darwin letters and manuscripts. They also thank the Syndics of Cambridge University Library and other owners of manuscript letters who have generously made them available.

Work for this edition has been supported by grants from the National Endowment for the Humanities (NEH), the National Science Foundation (NSF), and the Wellcome Trust. The Alfred P. Sloan Foundation and the Andrew W. Mellon Foundation provided grants to match NEH funding, and the Mellon Foundation awarded grants to Cambridge University that made it possible to put the entire Darwin correspondence into machine-readable form. Research and editorial work have also been supported by grants from the Arts and Humanities Research Council, the British Academy, the British Ecological Society, the Isaac Newton Trust, the Jephcott Charitable Trust, the John Templeton Foundation, the Natural Environment Research Council, the Parasol Foundation Trust, the Royal Society of London, and the Wilkinson Charitable Foundation. The Stifterverband für die Deutsche Wissenschaft provided funds to translate and edit Darwin's correspondence with German naturalists.

Since 2010, funding sufficient to complete the entire edition has been provided by the Alfred P. Sloan Foundation, the Andrew W. Mellon Foundation, the Evolution Education Trust, and the Isaac Newton Trust. We are extremely grateful for this unprecedented long-term support. We particularly wish to acknowledge the role of the Evolution Education Trust, without whose imaginative and generous support so distinguished a consortium could not have been established.

Cambridge University Library, the American Philosophical Society (APS), Harvard University, and Cornell University have generously made working space and many services available to the editors; the American Council of Learned Societies has provided invaluable administrative and strategic support.

Since the project began in 1975, the editors have been fortunate in benefiting from the interest, experience, and practical help of many people, and hope that they have adequately expressed their thanks to them individually as the work proceeded.

English Heritage has responded most generously to requests for information and for material from the collections at Down House, Downe. We are particularly grateful to past and present curators, Laura Houliston, Annie Kemkaran-Smith, Sarah Moulden, Frances Parton, Cathy Power, and Tori Reeve. The late Richard

Darwin Keynes kindly made available Darwin family material in his possession. The late Ursula Mommens provided letters and other materials that belonged to her grandfather, Francis Darwin. The Cornford family have generously made available letters written by William Darwin and Henrietta Litchfield.

Institutions and individuals all over the world have given indispensable help by making available photocopies or digital images of Darwin correspondence and other manuscripts in their collections. Those who furnished copies of letters for this volume can be found in the List of provenances. The editors are indebted to them, and to the many people who have provided information about the locations of particular letters.

The editors make daily use of the incomparable facilities of Cambridge University Library and have benefited greatly from its services and from the help and expertise of its staff, particularly the staff of the Manuscripts Department. We are especially grateful to the University Librarian, Jessica Gardner, and to her predecessors Anne Jarvis, Peter K. Fox, and Frederick W. Ratcliffe, and to the Keeper of Archives and Modern Manuscripts, Katrina Dean, and her predecessors Suzanne Paul and Patrick Zutshi, for their generous support. Other members of the library's staff who frequently respond to the editors' requests are: Marjolein Allen, Wendy Aylett, Jim Bloxam, Frank Bowles, Mark Box, Louise Clarke, Colin Clarkson, Jacqueline Cox, Maureen Dann, Amélie Deblauwe, John Hall, Anna Johnson, Morag Law, Scott Maloney, Błazej Mikuła, Ben Outhwaite, Domniki Papadimitriou, Maciej Pawlikowski, Adam Perkins, Ben Perks, Nicholas Smith, Anne Taylor, Ngaio Vince-Dewerse, John Wells, and Jill Whitelock. The fetchers in the Rare Books reading room have also patiently dealt with the editors' often complex requirements, as have the staff of the Map Room.

The editors would like to acknowledge the assistance of Marten L. Leavitt of the American Philosphical Society Library, Rodney Dennis, Jennie Rathbun, and Susan Halpert of the Houghton Library, Constance Carter of the Science Division of the Library of Congress, and Judith Warnement, Lisa DeCesare, and Jean Cargill of the Gray Herbarium of Harvard University, who have all been exceptionally helpful in providing material from the collections in their charge.

In Britain, the editors have received assistance from Lynda Brooks (librarian), Gina Douglas (former librarian), and Ben Sherwood of the Linnean Society of London; and from Lorna Cahill, Michele Losse, Virginia Mills, and Kiri Ross Jones of the Royal Botanic Gardens, Kew. We would also like to thank Anne Barrett, college archivist at the Imperial College of Science, Technology and Medicine; successive librarians and archivists of Christ's College, Cambridge; Simon Chaplin, head of the Wellcome Library, Wellcome Trust; and Sarah Rayner and John Hodgson at The John Rylands Library.

We owe a considerable debt to the staff of the American Council of Learned Societies for their help and advice since the Project began. We particularly thank the president, Pauline Yu, Steven Wheatley, and Kelly Buttermore, for their generosity and unfailingly warm welcome.

Among the others who advise and assist the editors in their work are Nick Gill, Randal Keynes, David Kohn, Gene Kritsky, Carl F. Miller, Jim Moore, Garry J. Tee, John van Wyhe, David West, and Leonard Wilson. The editors are also pleased to acknowledge the invaluable support of the members of the Project's Advisory Committee.

Among the many research resources on which we rely, special mention should be made of the Biodiversity Heritage Library (www.biodiversitylibrary.org), the Darwin Manuscripts Project (www.amnh.org), and Darwin Online (darwin-online.org.uk).

From 2009 to 2013 we were fortunate to work with a group of colleagues based at Harvard under the direction of Professor Janet Browne and supported by grants from the National Endowment for the Humanities and the National Science Foundation. We are grateful to the History of Science Department at Harvard for providing space and facilities, and to Janet Browne for making her time and expertise available.

For help with particular enquiries in volume 26 the editors would like to thank, besides those already mentioned, Salim Al-Gailani, Samar Al-Gailani, Philip Hardie, and Robert Scott Young.

We have relied heavily on expert technical assistance both from external consultants and from colleagues in Cambridge University in developing and maintaining our electronic resources, including our typesetting systems, and in making the correspondence available over the World Wide Web. We are particularly grateful to our colleagues Hal Blackburn, Iain Burke, Mary Chester-Kadwell, Andrew Corrigan, Jennie Fletcher, Wojciech Giel, Lesley Gray, Huw Jones, Philip Jones, Tuan Pham, Tristram Scott, Zhipeng Shan, Merina Tuladhar, and Tomasz Waldoch of Cambridge University Library. For past help, we particularly thank Maarten Bressinck, Simon Buck, Anne Clarke, Matthew Daws, Peter Dunn, Robin Fairbairns, Patricia Killiard, Chris Martin, John Norman, Martin Oldfield, and Grant Young. This volume has been typeset using Adobe InDesign.

Thanks are also due to all former staff and associates of the Darwin Correspondence Project, including: Doris E. Andrews, Katie Ericksen Baca, Geoff Belknap, Sarah Benton, the late Charlotte Bowman, Heidi Bradshaw, Pamela J. Brant, Janet Browne, P. Thomas Carroll, Finlay Clarkson, Stefanie Cookson, Andrew Corrigan, Henry Cowles, Sheila Dean, Sophie Defrance, Mario Di Gregorio, Rhonda Edwards, Deborah Fitzgerald, Kate Fletcher, Megan Formato, Hedy Franks, Jane Mork Gibson, Nick Gill, Philippa Hardman, Joy Harvey, Arne Hessenbruch, Thomas Horrocks, Dorothy Huffman, Rachel Iliffe, Andrew Inkpen, Christine M. Joyner, Thomas Junker, Rebecca Kelley, Joan W. Kimball, Barbara A. Kimmelman, David Kohn, Jyothi Krishnan-Unni, Gene Kritsky, Sam Kuper, Kathleen Lane, Sarah Lavelle, Margot Levy, Robert Lindsey, Jean Macqueen, Nancy Mautner, Anna K. Mayer, William Montgomery, Eleanor Moore, Leslie Nye, Perry O'Donovan, Stephen V. Pocock, Duncan Porter, John A. Reesman, Marsha L. Richmond, the late Peter Saunders, Andrew Sclater, Myrna Perez Shelton, Tracey Slotta, Jessee Smith, Kate Smith, the late Sydney Smith, Alison Soanes, Emma Spary, Alistair

Sponsel, Nora Carroll Stevenson, Edith Stewart, Zuzana Jakubisinowa Toci, Jenna Tonn, Jonathan R. Topham, Charissa Varma, Tyler Veak, Ellis Weinberger, Béatrice Willis, Sarah Wilmot, Jeremy Wong, and Rebecca Woods. We also thank our project colleague, Sally Stafford.

We are most grateful to Ann Parry for providing the index to the current volume.

Michael Sokal, who has represented the History of Science Society on the Project's Management Board since 2007, retired in 2017. We are most grateful to Michael for his dedication and invaluable guidance, and are pleased to welcome Marsha Richmond, who succeeds him.

We were very sad to learn in the course of preparation of this volume of the death of Sibyl Golden. Sibyl was a supporter and a friend, and for several years served as a member of our Advisory Committee.

Copyright statement

Darwin Correspondence Project
Cambridge University Library
West Road
Cambridge
United Kingdom
CB3 9DR

Email: darwin@lib.cam.ac.uk

PROVENANCES

The following list gives the locations of the original versions of the letters printed in this volume. The editors are grateful to all the institutions and individuals listed for allowing access to the letters in their care. Access to material in DAR 261 and DAR 263, formerly at Down House, Downe, Kent, England, is courtesy of English Heritage.

Alexander Turnbull Library, Wellington, New Zealand
American Philosophical Society, Philadelphia, Pennsylvania, USA
Archives de la famille de Candolle (private collection)
Archives of the Gray Herbarium, Harvard University, Cambridge, Massachusetts, USA
Artis Library, University of Amsterdam, Amsterdam, The Netherlands
Ashmolean Museum, Department of Antiquities, Oxford University, Oxford, England
Auckland War Memorial Museum Library—Tāmaki Paenga Hira, Auckland, New Zealand
Professor Robert J. Barney, PhD (private collection)
F. Louise Nash Barton (private collection)
Bayerische Akademie der Wissenschaften, Munich, Germany
Viscount Boyd of Merton (private collection)
The British Library, London, England
Cambridge University Library, Cambridge, England
Cambridge University Reporter (publication)
Christ Church Library, Oxford, England
Christie's, New York (dealers)
Cleveland Health Sciences Library, Case Western Reserve University, Cleveland, Ohio, USA
Conry 1972 (publication)
Cornford Family Papers (private collection)
CUL. See Cambridge University Library
Daily News (publication)
Dallinger 1887 (publication)
DAR. See Cambridge University Library
English Heritage, Down House, Downe, Kent, England

Ernst-Haeckel-Haus, Friedrich-Schiller-Universität, Jena, Germany
Ernst Mayr Library of the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
La France (publication)
Gallery of History (dealers)
Godlee 1917 (publication)
Niklas Gyllensporre (private collection)
Dr N. Hammond (private collection)
Peter Harrington (dealer)
Houghton Library, Harvard University, Cambridge, Massachusetts, USA
Imperial College of Science, Technology and Medicine, London, England
Institute of Astronomy Library, University of Cambridge, Cambridge, England
Institution of Engineering and Technology Archives, London, England
John Hay Library, Brown University, Providence, Rhode Island, USA
John Innes Foundation Historical Collections, John Innes Centre, Norwich, England
The John Rylands Library, The University of Manchester, Manchester, England
Linnean Society of London, Piccadilly, London, England
Liverpool University Library Special Collections and Archives, Liverpool, England
Stephan Loewentheil and The 19th Century Shop, Baltimore, Maryland (dealer)
Manchester Guardian (publication)
Michigan State University Archives and Historical Collections, East Lansing, Michigan, USA
Mitchell Library, State Library of New South Wales, Sydney, Australia
Möller ed. 1915–21 (publication)
Patricia Nash (private collection)
Nature (publication)
Niedersächsisches Landesarchiv – Standort Wolfenbüttel, Wolfenbüttel, Germany
Ogle trans. 1878 (publication)
Oxford University Museum of Natural History, Oxford, England
Parke-Bernet (dealers)
Perth Museum and Art Gallery, Perth, Scotland
Petit and Théodoridès 1959 (publication)
Barbara and Robert Pincus (private collection)
E. D. Romanes 1896 (publication)
The Royal Society, London, England
Russian State Archive of Literature and Arts (RGALI), Moscow, Russia
Joseph R. Sakmyster, ADS Autographs (dealer)
A. de Saporta (private collection)
Sotheby's (dealers)
Sotheby's, New York (dealers)
Staatsbibliothek zu Berlin – Preußischer Kulturbesitz, Berlin, Germany
State Darwin Museum, Moscow, Russia
State Library of South Australia, Adelaide, Australia

Sulivan family (private collection)
Swann Auction Galleries (dealers)
The Times (publication)
Trustees of the Royal Botanic Gardens, Kew, Richmond, Surrey, England
Universitäts- und Landesbibliothek Bonn, Bonn, Germany
Universitäts- und Landesbibliothek Düsseldorf, Düsseldorf, Germany
University of British Columbia Library, Rare Books and Special Collections, Vancouver, British Columbia, Canada
University of Exeter Special Collections, Exeter, Devon, England
University of Southern California Libraries, Special Collections, Feuchtwanger Memorial Library, Los Angeles, California, USA
University of Virginia Library, Special Collections, Charlottesville, Virginia, USA
John Wilson (dealer)
Yale University, Beinecke Rare Book and Manuscript Library, New Haven, Connecticut, USA
Yale University Library: Manuscripts and Archives, New Haven, Connecticut, USA
Zentralbibliothek Zürich, Zurich, Switzerland

A NOTE ON EDITORIAL POLICY

The first and chief objective of this edition is to provide complete and authoritative texts of Darwin's correspondence. For every letter to or from Darwin, the text that is available to the editors is always given in full. The editors have occasionally included letters that are not to or from Darwin if they are relevant to the published correspondence. Volumes of the *Correspondence* are published in chronological order. Occasional supplements will be published containing letters that have come to light or have been redated since the relevant volumes of the *Correspondence* appeared. Letters that can only be given a wide date range, in some instances spanning several decades, are printed in the supplement following the volume containing letters at the end of their date range. The first such supplement was in volume 7 and included letters from 1828 to 1857; the second was in volume 13, and included letters from 1822 to 1864; the third was in volume 18, and included letters from 1835 to 1869; the fourth was in volume 24 and included letters from 1838 to 1875.

Dating of letters and identification of correspondents

In so far as it is possible, the letters have been dated, arranged in chronological order, and the recipients or senders identified. Darwin seldom wrote the full date on his letters and, unless the addressee was well known to him, usually wrote only 'Dear Sir' or 'Dear Madam'. After the adoption of adhesive postage stamps in the 1840s, the separate covers that came into use with them were usually not preserved, and thus the dates and the names of many recipients of Darwin's letters have had to be derived from other evidence. The notes made by Francis Darwin on letters sent to him for his editions of his father's correspondence have been helpful, as have matching letters in the correspondence, but many dates and recipients have had to be deduced from the subject-matter or references in the letters themselves.

Transcription policy

Whenever possible, transcriptions have been made from manuscripts. If the manuscript was inaccessible but a photocopy or other facsimile version was available, that version has been used as the source. In many cases, the editors have had recourse to Francis Darwin's large collection of copies of letters, compiled in the 1880s. Other copies, published letters, or drafts have been transcribed when they provided texts that were otherwise unavailable.

The method of transcription employed in this edition is adapted from that described by Fredson Bowers in 'Transcription of manuscripts: the record of variants', *Studies in*

Bibliography 29 (1976): 212–64. This system is based on accepted principles of modern textual editing and has been widely adopted in literary editions.

The case for using the principles and techniques of this form of textual editing for historical and non-literary documents, both in manuscript and print, has been forcefully argued by G. Thomas Tanselle in 'The editing of historical documents', *Studies in Bibliography* 31 (1978): 1–56. The editors of the *Correspondence* followed Dr Tanselle in his conclusion that a 'scholarly edition of letters or journals should not contain a text which has editorially been corrected, made consistent, or otherwise smoothed out' (p. 48), but they have not wholly subscribed to the statement made earlier in the article that: 'In the case of notebooks, diaries, letters and the like, whatever state they are in constitutes their finished form, and the question of whether the writer "intended" something else is irrelevant' (p. 47). The editors have preserved the spelling, punctuation, and grammar of the original, but they have found it impossible to set aside entirely the question of authorial intent. One obvious reason is that in reading Darwin's writing, there must necessarily be reliance upon both context and intent. Even when Darwin's general intent is clear, there are cases in which alternative readings are, or may be, possible, and therefore the transcription decided upon must to some extent be conjectural. Where the editors are uncertain of their transcription, the doubtful text has been enclosed in italic square brackets.

A major editorial decision was to adopt the so-called 'clear-text' method of transcription, which so far as possible keeps the text free of brackets recording deletions, insertions, and other alterations in the places at which they occur. Darwin's changes are, however, recorded in the back matter of the volume, under 'Manuscript alterations and comments', in notes keyed to the printed text by paragraph and line number. All lines above the first paragraph of the letter (that is, date, address, or salutation) are referred to as paragraph 'o'. Separate paragraph numbers are used for subscriptions and postscripts. This practice enables the reader who wishes to do so to reconstruct the manuscript versions of Darwin's autograph letters, while furnishing printed versions that are uninterrupted by editorial interpolations. The 'Manuscript alterations and comments' record all alterations made by Darwin in his letters and any editorial amendments made in transcription, and also where part of a letter has been written by an amanuensis; they do not record alterations made by amanuenses. No attempt has been made to record systematically all alterations to the text of copies of Darwin letters included in the correspondence, but ambiguous passages in copies are noted. The editors believe it would be impracticable to attempt to go further without reliable information about the texts of the original versions of the letters concerned. Letters to Darwin have been transcribed without recording any of the writers' alterations unless they reflect significant changes in substance or impede the sense; in such cases footnotes bring them to the reader's attention.

Misspellings have been preserved, even when it is clear that they were unintentional: for instance, 'lawer' for 'lawyer'. Such errors often indicate excitement or haste and may exhibit, over a series of letters, a habit of carelessness in writing to a particular correspondent or about a particular subject.

Capital letters have also been transcribed as they occur except in certain cases, such as 'm', 'k', and 'c', which are frequently written somewhat larger than others as initial letters of words. In these cases an attempt has been made to follow the normal practice of the writers.

In some instances that are not misspellings in a strict sense, editorial corrections have been made. In his early manuscripts and letters Darwin consistently wrote 'bl' so that it looks like 'lb' as in 'albe' for 'able', 'talbe' for 'table'. Because the form of the letters is so consistent in different words, the editors consider that this is most unlikely to be a misspelling but must be explained simply as a peculiarity of Darwin's handwriting. Consequently, the affected words have been transcribed as normally spelled and no record of any alteration is given in the textual apparatus. Elsewhere, though, there are misformed letters that the editors have recorded because they do, or could, affect the meaning of the word in which they appear. The main example is the occasional inadvertent crossing of 'l'. When the editors are satisfied that the intended letter was 'l' and not 't', as, for example, in 'stippers' or 'istand', then 'l' has been transcribed, but the actual form of the word in the manuscript has been given in the Manuscript alterations and comments.

If the only source for a letter is a copy, the editors have frequently retained corrections made to the text when it is clear that they were based upon comparison with the original. Francis Darwin's corrections of misreadings by copyists have usually been followed; corrections to the text that appear to be editorial alterations have not been retained.

Editorial interpolations in the text are in square brackets. Italic square brackets enclose conjectured readings and descriptions of illegible passages. To avoid confusion, in the few instances in which Darwin himself used square brackets, they have been altered by the editors to parentheses with the change recorded in the Manuscript alterations and comments. In letters to Darwin, square brackets have been changed to parentheses silently.

Material that is irrecoverable because the manuscript has been torn or damaged is indicated by angle brackets; any text supplied within them is obviously the responsibility of the editors. Occasionally, the editors are able to supply missing sections of text by using ultraviolet light (where text has been lost owing to damp) or by reference to transcripts or photocopies of manuscript material made before the damage occurred.

Words and passages that have been underlined for emphasis are printed in italics in accordance with conventional practice. Where the author of a letter has indicated greater emphasis by underlining a word or passage two or more times, the text is printed in bold type.

Paragraphs are often not clearly indicated in the letters. Darwin and others sometimes marked a change of subject by leaving a somewhat larger space than usual between sentences; sometimes Darwin employed a longer dash. In these cases, and when the subject is clearly changed in very long stretches of text, a new paragraph has been started by the editors without comment. The beginnings of letters,

valedictions, and postscripts are also treated as new paragraphs regardless of whether they appear as new paragraphs in the manuscript. Special manuscript devices delimiting sections or paragraphs, for example, blank spaces left between sections of text and lines drawn across the page, are treated as normal paragraph indicators and are not specially marked or recorded unless their omission leaves the text unclear.

Occasionally punctuation marking the end of a clause or sentence is not present in the manuscript, but the author has made his or her intention clear by allowing, for example, extra space or a line break to function as punctuation. In such cases, the editors have inserted an extra space following the sentence or clause to set it off from the following text.

Additions to a letter that run over into the margins, or are continued at its head or foot, are transcribed at the point in the text at which the editors believe they were intended to be read. The placement of such an addition is only recorded in a footnote if it seems to the editors to have some significance or if the position at which it should be transcribed is unclear. Enclosures are transcribed following the letter.

The hand-drawn illustrations and diagrams that occur in some letters are reproduced as faithfully as possible and are usually positioned as they were in the original text. In some cases, however, it has been necessary to reduce the size of a diagram or enhance an outline for clarity; any such alterations are recorded in footnotes. The location of diagrams within a letter is sometimes changed for typesetting reasons. Tables have been reproduced as close to the original format as possible, given typesetting constraints.

Some Darwin letters and a few letters to Darwin are known only from entries in the catalogues of book and manuscript dealers or mentions in other published sources. Whatever information these sources provide about the content of such letters has been reproduced without substantial change. Any errors detected are included in footnotes.

Format of published letters

The format in which the transcriptions are printed in the *Correspondence* is as follows:

1. *Order of letters*. The letters are arranged in chronological sequence. A letter that can be dated only approximately is placed at the earliest date on which the editors believe it could have been written. The basis of a date supplied by the editors is given in a footnote unless it is derived from a postmark, watermark, or endorsement that is recorded in the physical description of the letter (see section 4, below). Letters with the same date, or with a range of dates commencing with that date, are printed in the alphabetical order of their senders or recipients unless their contents dictate a clear alternative order. Letters dated only to a year or a range of years precede letters that are dated to a particular month or range of months, and these, in turn, precede those that are dated to a particular day or range of dates commencing with a particular day.

2. *Headline*. This gives the name of the sender or recipient of the letter and its date. The date is given in a standard form, but those elements not taken directly from the

letter text are supplied in square brackets. The name of the sender or recipient is enclosed in square brackets only where the editors regard the attribution as doubtful.

3. *The letter text*. The transcribed text follows as closely as possible the layout of the source, although no attempt is made to produce a type-facsimile of the manuscript: word-spacing and line-division in the running text are not adhered to. Similarly, the typography of printed sources is not replicated. Dates and addresses given by authors are transcribed as they appear, except that if both the date and the address are at the head of the letter they are always printed on separate lines with the address first, regardless of the manuscript order. If no address is given on a letter by Darwin, the editors have supplied one, when able to do so, in square brackets at the head of the letter. Similarly, if Darwin was writing from an address different from the one given on the letter, his actual location is given in square brackets. Addresses on printed stationery are transcribed in italics. Addresses, dates, and valedictions have been run into single lines to save space, but the positions of line-breaks in the original are marked by vertical bars.

4. *Physical description*. All letters are complete and in the hand of the sender unless otherwise indicated. If a letter was written by an amanuensis, or exists only as a draft or a copy, or is incomplete, or is in some other way unusual, then the editors provide the information needed to complete the description. Postmarks, endorsements, and watermarks are recorded only when they are evidence for the date or address of the letter.

5. *Source*. The final line provides the provenance of the text. Some sources are given in abbreviated form (for example, DAR 140: 18) but are listed in full in the List of provenances unless the source is a published work. Letters in private collections are also indicated. References to published works are given in author–date or short-title form, with full titles and publication details supplied in the Bibliography at the end of the volume.

6. *Darwin's annotations*. Darwin frequently made notes in the margins of the letters he received, scored significant passages, and crossed through details that were of no further interest to him. These annotations are transcribed or described following the letter text. They are keyed to the letter text by paragraph and line numbers. Most notes are short, but occasionally they run from a paragraph to several pages, and sometimes they are written on separate sheets appended to the letter. Extended notes relating to a letter are transcribed whenever practicable following the annotations as 'CD notes'.

Quotations from Darwin manuscripts in footnotes and elsewhere, and the text of his annotations and notes on letters, are transcribed in 'descriptive' style. In this method the alterations in the text are recorded in brackets at the places where they occur. For example:

'See Daubeny ['vol. 1' *del*] for *descriptions of volcanoes in [*interl*] S.A.' *ink*

means that Darwin originally wrote in ink 'See Daubeny vol. 1 for S.A.' and then deleted 'vol. 1' and inserted 'descriptions of volcanoes in' after 'for'. The asterisk

before 'descriptions' marks the beginning of the interlined phrase, which ends at the bracket. The asterisk is used when the alteration applies to more than the immediately preceding word. The final text can be read simply by skipping the material in brackets. Descriptive style is also used in the Manuscript alterations and comments.

Editorial matter

Each volume is self-contained, having its own index, bibliography, and biographical register. A chronology of Darwin's activities covering the period of each volume and translations of foreign-language letters are supplied, and additional appendixes give supplementary material where appropriate to assist the understanding of the correspondence. A cumulative index is planned once the edition is complete. References are supplied for all persons, publications, and subjects mentioned, even though some repetition of material in earlier volumes is involved.

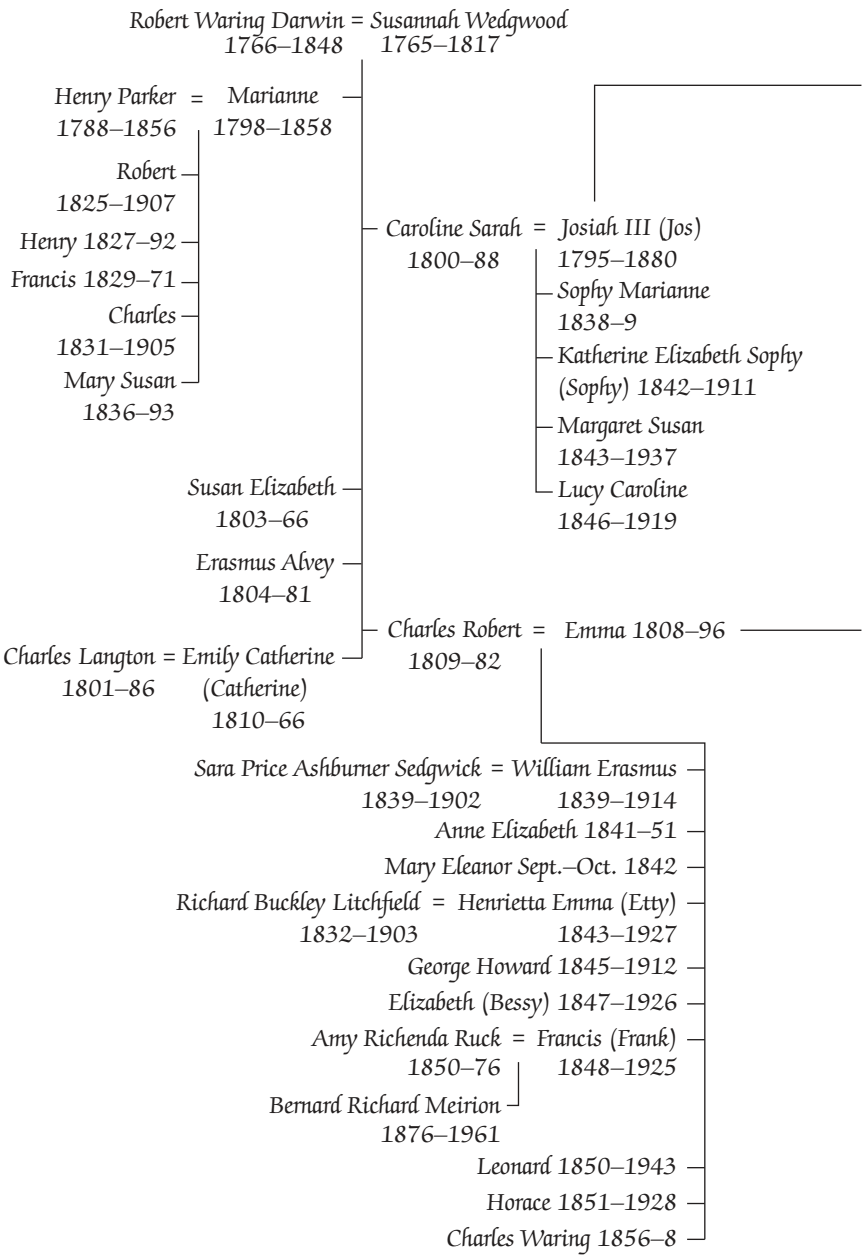
If the name of a person mentioned in a letter is incomplete or incorrectly spelled, the full, correct form is given in a footnote. Brief biographies of persons mentioned in the letters, and dates of each correspondent's letters to and from Darwin in the current volume, are given in the Biographical register and index to correspondents. Where a personal name serves as a company name, it is listed according to the family name but retains its original order: for example, 'E. Schweizerbart'sche Verlagsbuchhandlung' is listed under 'S', not 'E'.

Short titles are used for references to Darwin's books and articles and to collections of his letters (e.g., *Descent*, 'Parallel roads of Glen Roy', *LL*). They are also used for some standard reference works and for works with no identifiable author (e.g., *Alum. Cantab.*, *Wellesley index*, *DNB*). For all other works, author–date references are used. References to the Bible are to the authorised King James version unless otherwise stated. Words not in *Chambers dictionary* are usually defined in the footnotes with a source supplied. The full titles and publication details of all books and papers referred to are given in the Bibliography. References to archival material, for instance that in the Darwin Archive at Cambridge University Library, are not necessarily exhaustive.

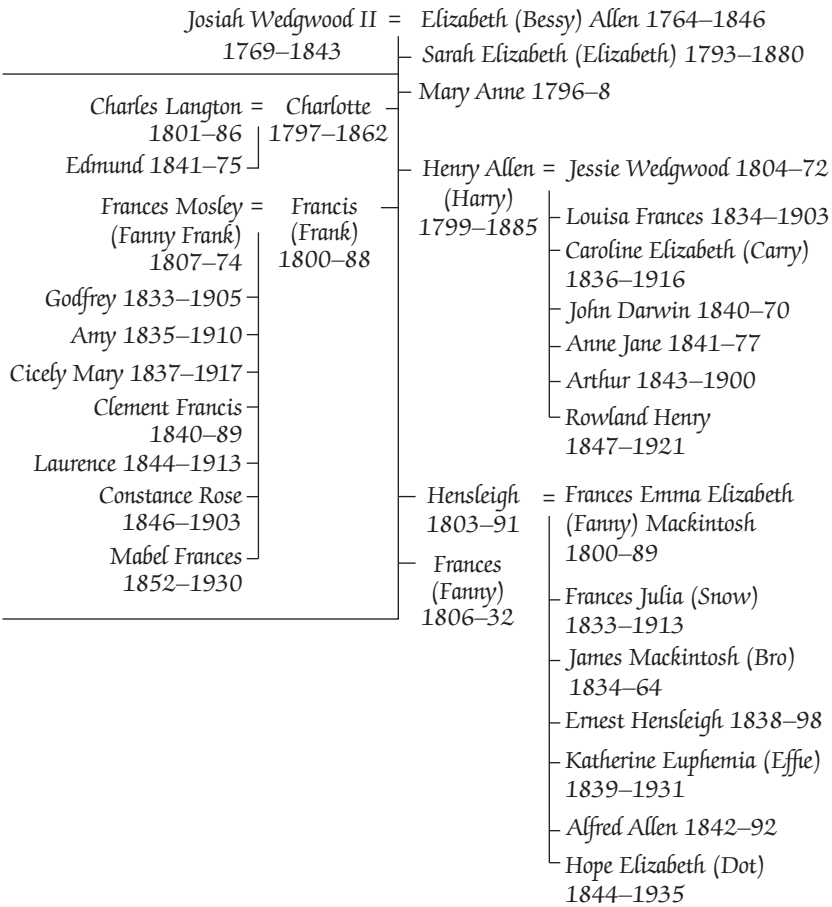
Darwin and his correspondents writing in English consistently used the term 'fertilisation' for the processes that are now distinguished as fertilisation (the fusion of female and male gametes) and pollination (the transfer of pollen from anther to stigma); the first usage known to the editors of a distinct term for pollination in English was in 1873 (letter from A. W. Bennett, 12 July 1873 (*Calendar* no. 8976)). 'Fertilisation' in Darwin's letters and publications often, but not always, can be regarded as referring to what is now termed pollination. In the footnotes, the editors, where possible, have used the modern terms where these can assist in explaining the details of experimental work. When Darwin or his correspondents are quoted directly, their original usage is never altered.

The editors use the abbreviation 'CD' for Charles Darwin throughout the footnotes. A list of all abbreviations used by the editors in this volume is given on p. xliv.

The Wedgwood and Darwin



Families up to 1878



ABBREVIATIONS

AL	autograph letter
ALS	autograph letter signed
DS	document signed
LS	letter in hand of amanuensis, signed by sender
LS(A)	letter in hand of amanuensis with additions by sender
Mem	memorandum
pc	postcard
(S)	signed with sender's name by amanuensis
TLS	typed letter signed

CD	Charles Darwin
CUL	Cambridge University Library
DAR	Darwin Archive, Cambridge University Library
del	deleted
illeg	illegible
interl	interlined
underl	underlined

TRANSCRIPTION CONVENTIONS

[some text]	'some text' is an editorial insertion
*[*some text*]*	'some text' is the conjectured reading of an ambiguous word or passage
[some text]	'some text' is a description of a word or passage that cannot be transcribed, e.g., '*3 words illeg*'
〈 〉	word(s) destroyed
〈some text〉	'some text' is a suggested reading for a destroyed word or passage
〈*some text*〉	'some text' is a description of a destroyed word or passage, e.g., '*3 lines excised*'