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978-0-521-82156-8 - The Collected Letters of Erasmus Darwin  
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THE COLLECTED LETTERS OF  
ERASMUS DARWIN

Erasmus Darwin has often been cited as the most widely talented man of the past 250 years. He excelled in medicine and poetry, was an inventor and a man of science, and founded numerous societies. This collection of 460 of Darwin's letters, of which over half have never been published, provides many insights into the life of this amazing man.

Darwin was famous throughout Britain as a physician, and his medical letters to patients, and private letters to his physician son Robert spiced with outspoken medical opinions, are a rich source for historians of medicine. His lively letters to the 'Lunar Men', Boulton, Watt, Keir and Wedgwood, throw light on the progress of the Industrial Revolution in England. The letters also show that as a man of science, Erasmus Darwin was enthusiastic about physics, chemistry, meteorology and biology. This unique collection reveals not only the variety of Erasmus Darwin's talents, but also his wide range of important friendships.

DESMOND KING-HELE FRS is recognized as the world's leading authority on Erasmus Darwin. He has written 20 books and 300 papers, and his biography of Erasmus Darwin won the Society of Authors' Medical History Prize in 1999.

His edition of Darwin's letters published in 1981 included all the letters available at that time. Since then, a further 240 original manuscript letters have come to light, and all are collected in the present edition.

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Erasmus Darwin (1731–1802) at the age of 38,  
from a portrait by Joseph Wright of Derby

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## INTRODUCTION

### ERASMUS DARWIN AND HIS LETTERS

Erasmus Darwin (1731–1802) is famous for having achieved more in a wider range of intellectual disciplines than any later rival.

In the 1790s Darwin was rated second to none as a physician and medical author, especially after the publication in 1794–6 of his massive book *Zoonomia, or the Laws of Organic Life*, four volumes and more than 2000 pages in its third edition, and known worldwide through its translation into French, German, Italian and Portuguese, and its many American editions.

At the same time, the 1790s, Darwin was also recognized as the leading English poet of the day after the publication of *The Botanic Garden* in 1792. This is shown by many tributes: even Coleridge, who detested his rhyming-couplet style, called him in 1797 ‘the first *literary* character of Europe and the most original-minded man’. And in 1796 the elderly Horace Walpole wrote that ‘it is a great satisfaction to me to have lived long enough to see one of our most capital poets, Dr Darwin’.

All this adulation had turned sour by 1800. In one chapter of *Zoonomia*, and the whole of his last poem *The Temple of Nature* (1803), Darwin propounded the idea of biological evolution, as we call it: he believed that life on Earth began as microscopic ‘filaments’ in primeval seas and developed under the influence of natural forces through fishes, amphibians and reptiles to humankind, as he called us. He saw how the process was controlled by the struggle for existence, which he vividly presents in his poem. And in *Zoonomia* he clearly explains the mechanism of sexual selection, saying that the outcome of the ‘contests among the males’ in some species is ‘that the strongest and most active animal should propagate the species, which should thence become improved’.

In expressing these ideas Darwin committed a serious crime. He tacitly assumed that God had no role in the creation of species. This was too much for his readers to stomach, and *The Temple of Nature* came in for ferocious criticism: ‘if there is such a thing as atheism, this is it’, wrote his former friend Joseph Priestley. And the anonymous reviewer in *The British Critic* was outraged: ‘we are full of horror and will write no more’.

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So Erasmus, although he propounded a more thoroughgoing view of evolution than his grandson Charles, failed to achieve any current public approval. Charles was aware of the concepts of evolution through reading *Zoonomia* when he was about 17: ‘at this time I admired greatly the *Zoonomia*’, he said. But he was not converted to evolutionism until after the voyage of the *Beagle*, when he was about 30; only then did he begin to formulate an evolutionary theory. Charles concentrated on natural selection as the main mechanism of evolution. Erasmus recognized this 50 years earlier, but took a wider view of evolution as the guiding force throughout the history of life on Earth. Most readers of his books regard Erasmus Darwin as the founding father of modern evolutionism.

Erasmus’s evolutionary views also carried political implications. Britain had been at war with France since 1793, and things were going badly in 1797. The Government set up the *Anti-Jacobin* magazine to combat subversion: and what could be more subversive – or even treasonable – than the implication that Britons had apes as their ancestors? In April 1798 the *Anti-Jacobin* magazine published ‘The Loves of the Triangles’, a satire in verse on Darwin’s ‘The Loves of the Plants’ (the second half of *The Botanic Garden*). The future Prime Minister George Canning wrote much of the satire, and in sarcastic notes he ridiculed Darwin’s evolutionary ideas. After this attack Darwin’s high reputation as a poet began to crumble, and was further damaged later in the year by the publication of *Lyrical Ballads*, where Wordsworth and Coleridge condemned Darwin’s ‘gaudy’ style.

After his death Darwin’s fame as a poet, and as a doctor and medical author, continued to decline: his verse style and his system of medicine both became outdated. And he received only harsh words for propounding evolution, or Darwinism as Coleridge called it.

Despite this downward slide, Darwin greatly impressed many of the Romantic poets – Wordsworth, Coleridge and Blake in the 1790s; Shelley and Keats later. They rejected his style but took over his subject matter (in short, Nature) and sometimes echoed his very words. His literary influence is documented in my book *Erasmus Darwin and the Romantic Poets* (1986).

As science marched on, most of Darwin’s medical theory was left by the roadside. However, his high status as a caring physician has remained secure, and is fortified by dozens of letters in this book.

Darwin was greatly respected in his own lifetime as an omniscient man of science, with ‘a greater range of knowledge than any other man in Europe’, in Coleridge’s view. This high scientific reputation endured, though muted because he was out of fashion after the other attacks. Today, his amazing insight into Nature’s workings seems to me the most impressive of his many talents.

His evolutionary revelations were unique: he was the first to tell us where we came from (microscopic specks), how we got here (via gradual evolution, with no supernatural help), and how long it took (hundreds of millions of years, not the orthodox 6,000 years). It is only recently that these revelations have been



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fully validated by the similarities between our genes and those of earlier forms of life.

Darwin made fundamental advances in other areas of biological and physical science. In his 600-page book *Phytologia* (1800) he gave the first description of the full process of photosynthesis in plants, on which nearly all life depends. Starting from the basic results of Priestley and Ingenhousz, he explained that, in sunlight, plants convert carbon dioxide and water into sugar or starch, and exhale oxygen.

His insights into plant nutrition were also far-reaching: in addition to carbon, he specifies nitrogen, calcium and phosphorus as essential nutrients, and suggests using nitrates and calcium phosphate as fertilizers. He even appreciates how limestone formed from shells would have reduced the carbon dioxide in the atmosphere. And there is much, much more in *Phytologia*; for instance his overarching philosophy of ‘organic happiness’, seeing evolution as the survival of the happiest and most active animate beings.

In physical science Darwin ranged widely. He was one of the first English chemists to abandon the phlogiston theory: he adopted the ‘French heresy’ of the oxygen theory in 1788 and publicized the new ideas in his widely read poem *The Botanic Garden* (1792). So his readers leapt ahead of the British chemists, who were still wrapped in the fog of phlogiston.

In astronomy he offered a big-bang picture of creation, with ‘the whole of Chaos . . . exploded at the same time and dispersed through infinite space’; and a black-hole ending in which ‘star after star’ shall ‘headlong extinct to one dark centre fall’. (Darwin was a close friend of John Michell, who first formulated the black-hole concept.) Nearer home, Darwin believed the Moon was formed violently, from material torn out of the Earth in a mighty explosion. In recent years this view has become orthodox. Earth is believed to have been struck by a Mars-like object, with the debris from the collision coming together to form the Moon.

Darwin was also prescient in his views on geology. He took ‘millions of ages’ as his timescale and correctly specified the roles of both volcanic and sedimentary rocks in Earth history. He obtained borings from mines and recognized the importance of strata, and of fossils. He emphasized the biological origins of limestone, coal and oil, and advocated drilling for oil. He postulated a fluid core for the Earth composed mainly of iron. Nearer the surface, he was the first to explain the functioning of ‘artesian’ wells (as they were later called) – and bored one in his garden.

His greatest success in physical science was in defining the properties of gases, particularly air. In 1762, many years before others, he proposed in a letter the ideal gas law and the law of partial pressures. And in 1787 he published his classic paper defining the law of adiabatic expansion of gases – that a gas cools when allowed to expand without any gain or loss of heat. He then applied this principle to explain the formation of clouds and rain, and the coldness of high mountains.

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He was an ‘air man’ in another sense too, as the first Briton to fly a large hydrogen balloon, in 1783; and his prediction of powered air travel in *The Botanic Garden* inspired the inventor of the aeroplane, Sir George Cayley.

Darwin’s mental energy in formulating new scientific ideas was matched by his practical flair for mechanical invention. Indeed, if he had enjoyed a private income, with no financial need to be a doctor, he would have spent much more time and energy on inventions. As it was, he feared his medical career would suffer if he was known as a ‘mad inventor’. So he never patented his machines, which have remained little known.

But these inventions of his were certainly important. In the 1760s, provoked by the perils and discomfort of travelling 10,000 miles a year visiting his patients, he designed a new method of carriage steering and successfully tested it out over 20,000 miles in two carriages. It was not taken up by the coach-makers of the day, but came to be adopted in most early modern cars, including the Ford Model T. Today the steering mechanisms of cars are more complex, but the Darwinian principle of steering still rules the motorways.

Another epoch-making invention was Darwin’s mechanical copying-machine, which produced the first known exact copy of a document – a letter he wrote in 1778. The two versions are indistinguishable. A similar machine was devised and patented 20 years later by Marc Isambard Brunel – and acclaimed by Thomas Jefferson.

Darwin also constructed a speaking-machine which astonished everybody, but was never completed; and he produced at least 44 other inventions, either real hardware or just sketches. The latter include a multi-mirror telescope, first successfully constructed in 1799; a hydrogen–oxygen rocket motor, as used in the Apollo lunar project and the Space Shuttle; and an internal combustion engine with hydrogen as fuel, officially adopted in 2002 for the USA’s car of the future.

All these intellectual interests of Darwin had to be fitted into his ‘spare time’: it seems surprising that he had any, with his heavy medical duties plus a very busy family and social life.

Erasmus was born at Elston, near Newark, the youngest son of an early-retired lawyer who had inherited Elston Hall. Erasmus was for nine years a pupil at Chesterfield School: and this was followed by six years of studying medicine at Cambridge and Edinburgh before he began his career as a physician at Lichfield in 1756.

He married Mary Howard in 1757, and they lived in the house at Lichfield now open to visitors as Erasmus Darwin House. Their marriage was a happy one, and they had five children, of whom three sons survived: the youngest, Robert, became the father of Charles Darwin. But Mary, or Polly as she was known, fell ill about 1767, probably from gall-stones: she died in 1770. Erasmus was devastated by her death and by his failure as a doctor to save her.

Throughout the 1770s his sister Susannah acted as housekeeper. And from 1771 to 1773, or perhaps later, Erasmus enjoyed a liaison with young Robert’s

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nanny, Mary Parker. Their two daughters, known as ‘the Miss Parkers’, were brought up in his house and later they ran a most successful boarding school for young ladies, at Ashbourne, for 30 years.

In the mid 1770s Darwin fell in love with Mrs Elizabeth Pole, wife of a hero of the Seven Years’ War, Colonel Edward Pole, of Radburn Hall, near Derby. Erasmus plied Elizabeth with ardent verses, sometimes confident, sometimes sad. But that was as much as he could do. Then, in 1780, Colonel Pole died.

Erasmus married Elizabeth in 1781, when he was 49. It proved another happy marriage, and they had seven children, to add to three of Elizabeth’s and the two Miss Parkers. Erasmus and Elizabeth lived first at Radburn Hall for three years, and then for 18 years in a fine town house in Full Street, Derby, with the back garden extending down to the river Derwent. By 1787 it was a full house, with nine children under 18 living there – not an ideal ambience for writing his lengthy books.

In March 1802 the family moved to a country house four miles north of Derby, Breadsall Priory; and there Erasmus died a month later, aged 70.

Darwin was famous for his ‘benevolence’ – being helpful to nearly everyone, but particularly his family, friends and patients. He gave free treatment to local people in need, and derived his income chiefly from visiting rich patients in their country houses.

Darwin’s social skills were exceptional, and he founded four societies (or possibly six), most famously the Lunar Society of Birmingham, which originated at his house in Lichfield during the early 1760s. There Erasmus kept open house for his scientific friends such as John Michell, Matthew Boulton the manufacturer and John Whitehurst the inventor; and it seems that Polly was happy to welcome them too. Benjamin Franklin was among the visitors, and in 1765 he introduced the many-talented Dr William Small to Boulton and Darwin. In the next three years the circle of friends grew, with Darwin recruiting the potter Josiah Wedgwood, the engineer James Watt (who was still living in Scotland), James Keir the pioneer of the chemical industry, and others. The self-effacing Small kept them together, and, when they met, the genial Boulton usually acted as host at his newly built Soho House.

This informal ‘Lunar group’ grew into what is often seen as the chief intellectual driving force of the Industrial Revolution in England. Darwin was the most intellectual of the group: he has been called ‘Mr Enlightenment himself’ and ‘the leading *philosophe* of late eighteenth-century England’. Add to this his social skills, and his zeal for science and invention, and you can see how he animated the Lunar pursuit of ‘progress’, their quest for advances in science that could lead to improvements in technology and manufacture.

Nearly half of Darwin’s letters are addressed to the Lunar Men – ‘the friends who made the future’ in Jenny Uglow’s phrase. There are 103 letters in this book to Josiah Wedgwood, a friend of Darwin for thirty years; 36 letters to Matthew Boulton, covering forty years; and 30 to James Watt, a friend for thirty-five years. There were probably as many letters to James Keir, but most were lost in a fire;

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and to Richard Edgeworth, who deliberately burnt all but a few. Only four letters have survived from Darwin to his friend and mentor Benjamin Franklin, whose American Philosophical Society may have been a model for the Lunar Society. There is only one letter to Joseph Priestley, who activated the Society in the 1780s when Darwin was at Derby; and none at all to either John Michell or John Whitehurst, who were probable role models for Darwin in science and invention.

Another large group of letters might be classed as ‘medical’. These would include many of the 59 letters to his son Robert, a doctor at Shrewsbury who became as successful as his father, and financially more so. These letters to Robert mix family gossip with medical comments untrammelled by confidentiality. In these letters, and about 50 others to patients, or doctors such as Thomas Beddoes, Darwin’s medical treatments (good and bad) are candidly confessed. These letters also bring out the kindness to patients for which he was famous.

Darwin’s many scientific letters include seven to Sir Joseph Banks about botany, two on electricity to Georgiana, Duchess of Devonshire, and a number to his Lunar friends. He wrote confidentially about his inventions to Charles Greville and the Society of Arts, and discussed his metaphysical ideas with theologians. He wrote passionate letters in verse to his first and second wives, and letters in prose to poets, notably to his neighbour and pupil Anna Seward.

A fair microcosm of eighteenth-century life emerges in my biographical index, which gives the names, and dates if known, of about a thousand people mentioned in his letters – ranging from the gardener Mr Talkington, whom he appraises for Wedgwood, to the Duke of Devonshire, who receives a fierce lecture on the perils of alcohol.

Darwin had no idea that his letters would be preserved for us to read, and he would probably be embarrassed that some are so trivial, as when he orders crayons from Boulton, or asks Wedgwood where he is. But more often the letters scintillate with flashes of wit, wisdom or banter, or reveal the ‘imperial command of words’ that won him such a high reputation as a poet in the 1790s. Such letters stamp themselves as his, even when the original manuscript is lost. These sparkling letters are as tasty as Byron’s, though Darwin is restrained by a ‘vein of reserve’ about his inner thoughts – a reserve that Byron cast aside.

Darwin’s vein of reserve creates a curious ‘missing link’ in his letters: he says very little about his greatest achievement – the formulation of biological evolution, as we call it. This idea was fixed in his mind by 1770, when he began to believe that life on Earth began as a single microscopic filament which developed into all the plants and creatures known on Earth, over hundreds of millions of years.

Darwin was nudged towards evolution in 1767 when Josiah Wedgwood sent him bags of bones found during the excavation of the Harecastle Tunnel. Many of the bones were from extinct animals, and he was puzzled, as shown by his

*Erasmus Darwin and his letters*

jokey letter to Wedgwood on 2 July 1767. But Darwin soon found an answer, in the idea of evolution. His family coat of arms consisted of three scallop shells, and in 1770 he added the motto *E conchis omnia*, or ‘everything from shells’, to express his belief that all life had developed from microscopic sea-creatures. He had the motto and coat of arms painted on his carriage and made into a bookplate:



But Darwin’s sharp-witted neighbour Canon Seward of Lichfield Cathedral saw that Darwin’s idea left no place for God as a creator of species. Seward hit back with some cutting verses. Darwin, he said,

renounces his Creator;  
 And forms all sense from senseless matter.  
 Great wizard he! by magic spells  
 Can all things raise from cockle shells.

Darwin was furious, but after this rebuke he could not publicly display the motto on his carriage and he had to paint it out; the motto survived only on the bookplate and on his seal.

Darwin may never have talked to his friends about his great subversive idea: certainly there is nothing about biological evolution in his letters between 1770 and 1794, the year when he went public with the long chapter ‘Of generation’ in his book *Zoonomia*. By then, he said, he was ‘too old and hardened to fear a little abuse’. The abuse came, more than a little. He replied defiantly with his last poem *The Temple of Nature; or, the Origin of Society*, published a year after his death. With amazing confidence, Darwin tells us how life originated and evolved:

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*Introduction*

Organic Life beneath the shoreless waves  
 Was born and nursed in Ocean's pearly caves.  
 First, forms minute, unseen by spheric glass,  
 Move on the mud, or pierce the watery mass.  
 These, as successive generations bloom,  
 New powers acquire, and larger limbs assume;  
 Whence countless groups of vegetation spring,  
 And breathing realms of fin, and feet, and wing:

He devotes 50 lines to explaining the struggle for existence among animals – and plants:

Yes! smiling Flora drives her armèd car  
 Through the thick ranks of vegetable war:  
 Herb, shrub, and tree, with strong emotions rise  
 For light and air, and battle in the skies;  
 Whose roots diverging with opposing toil  
 Contend below for moisture and for soil.

And he shows how the human animals can transcend this biological war by cooperating to create society – an appropriate theme for a man so keen on creating societies.

Darwin's eminence in medicine, and in physical and biological science (and especially his success in first telling us where we came from and how we got here); his important mechanical inventions; his primacy as a poet in the 1790s; his social skills and his role in creating societies – all these provoke a question I am often asked. Was he 'the greatest', the most talented all-rounder of all time, who combined high intellectual achievements with rich human skills? If the question is posed in this form, Darwin outdoes Newton, who failed in social skills, and also outdoes the founders of religions, who failed to specify how life evolved. A stronger rival would be Aristotle: he made mistakes, but so did Darwin. Another point in Darwin's favour is that he spent his life as a caring physician, trying to help others and reduce suffering: morally, this sets him far above the men of action like Caesar or Napoleon, who sent thousands to their deaths. Darwin's lack of 'influence' would count against him: here he would be outdone by Newton, Aristotle, the founders of religions and others, unless you agree that Darwinian evolution in its full scope from microbe to man was first formulated by Erasmus Darwin rather than by his grandson Charles; and this is surely a view that will become more prevalent in future.

Erasmus Darwin's achievement in formulating a new and valid biological world-view may be seen as the biological equivalent of Copernicus's achievement in formulating a new and valid physical world-view with his planetary heliocentrism: both were ideas that shook society when accepted. And the resemblance goes further. Copernicus, like Darwin, delayed publication for

### *Editorial principles*

more than twenty years to avoid religious backlash against his new world-system, and, like Darwin, he did not see his ideas accepted in his own lifetime.

As is seemly in an era of no closure, the question ‘who is the greatest?’ remains open.

#### EDITORIAL PRINCIPLES

My aim has been to print all the known letters written by Darwin, supplemented by relevant extracts from letters written *to* him, which appear in the notes.

The heading of each letter gives the name of the recipient and the date: if either is supplied editorially, it is enclosed in square brackets.

The letters are in chronological order. They are designated by their year and their numerical position in the sequence of letters for that year. Thus letter 66-2 is the second letter in 1766, letter 66-3 is the third, and letter 81-5 is the fifth letter in 1781. This method has the advantage that the year of any letter cited is immediately apparent. A letter of doubtful date is placed at the end of the most likely year. In these designations the new year-number is assumed to apply from 1 January: consequently, two pre-1752 letters have year-numbers different from the old-style date, in which the new year-number did not start until 25 March.

In transcribing the manuscripts, I have tried to print the letters as readably as possible, while remaining faithful to the intention of the original. I have generally retained Darwin’s spelling and most of his capitalization, but I have restored most of his abbreviations, as follows:

M <sup>r</sup>	M <sup>rs</sup>	D <sup>r</sup>	S <sup>r</sup>	L <sup>d</sup>	<i>are transcribed as:</i>	Mr	Mrs	Dr	Sir	Lord
y <sup>t</sup>	y <sup>c</sup>	y <sup>r</sup>	w <sup>h</sup>	p <sup>r</sup>	<i>are transcribed as:</i>	that	the	your	which	per
&	&c	comp <sup>i</sup>	Esq <sup>r</sup>		<i>are transcribed as:</i>	and	etc	compliments	Esq	
Bro <sup>r</sup>	Lich <sup>d</sup>	Rob <sup>t</sup>			<i>are transcribed as:</i>	Brother	Lichfield	Robert		

Also, *it’s* is transcribed as *its*; and *today* is adopted as the standard form. I restore words in which many letters are abbreviated into a flourish, except that *obed. serv.* is kept short because it is purely conventional; however, *affect<sup>ly</sup>* is spelt out in full, as *affectionately*.

If we go by modern usage, Darwin habitually mis-spells a number of common words. These unusual spellings are preserved. The most important are:

ach [*for* ache], affraid, agreable, antient, benifit, cabage, chuse, colum, compleat, desease [*for* disease], dilirium, fortun, fossiles, handsome, knowlege, least [*for* lest], loose [*for* lose], medecine, Parlament, percieve, recieve, sais, sieze, spirited, tom [*for* tome], volum, wastecoat, Wedgewood.

Darwin writes *of* as *off* when out on its own, as in *what was he thinking off?* This too is left unchanged. Darwin has a phonetic system for the past tense of regular verbs: he adds *ed* if the *e* is sounded; or *’d* if it is not; or just *d* if the verb ends in *e*. Examples would be *parted*, *pass’d* and *paced*. I have retained this convention.

### *Introduction*

Editorial interventions are signalled by square brackets, the most frequent being [?], to indicate that the preceding word may be in error, usually because it is scarcely legible. A missing but apparently intended word is inserted as [word], with a space before the first square bracket. No such space appears when a misleading spelling is being corrected, as in ‘ancient Room[Rome]’. Common words with an extra letter by mistake are silently corrected. Words with a letter wrong or missing by mistake are visibly corrected: e.g., ‘ha[d]’, in place of ‘has’. I have not recorded Darwin’s deletions (which are rare), unless they are significant.

Curly brackets indicate a torn or mutilated manuscript. Within the brackets are either conjectural words or a message in italics: e.g., {conjectural words} or {*torn, gap of two lines*}. A row of three asterisks denotes an omission of unknown length.

Darwin’s punctuation is rather a nightmare. He was often in a hurry, and I suspect that he then wrote letters without much punctuation apart from dashes. Later, on reading through the letter, he would insert some full stops and commas in competition with the dashes. However, his dots are sometimes short lines like commas; his commas have sometimes lost their tails; and both full stops and commas have sometimes faded with the years. So I have silently repunctuated, whenever necessary for clarity. Anyone requiring Darwin’s own punctuation, or the lack of it, should consult the manuscripts. (Darwin’s manuscript letters are reasonably legible, and I hope it may be possible in the future to publish a facsimile of the letters in the Cambridge University Library, most of which are already on microfilm.)

After deciding on the punctuation, I have started each new sentence with a capital letter. Darwin often fails to do so, particularly in sentences separated by dashes. I have used a capital A in Darwin’s ‘Adieu’, found at the end of many letters.

For paragraphs Darwin usually has the normal indented new line. But sometimes he forgets, and sometimes a longer dash than usual signals a new paragraph. I have silently started new paragraphs when it seemed appropriate.

In his early letters Darwin bestows initial capitals on many nouns, and a few adjectives. Often there seems little logic in his choice, though sometimes it is a form of emphasis. I have preserved this idiosyncrasy, which gradually fades after 1770. For words starting with lower-case letters that are larger than normal, I have used my own judgement.

In letters transcribed from manuscript copies, not in Darwin’s hand, and in letters taken from printed sources, my editing has been similar but more severe: I have occasionally altered words that seem wrong, marking them with [?]; and I have restored Darwin’s mis-spellings.

Darwin’s diagrams are incorporated into the texts of the letters, most of them by photocopying from the originals. When this was not permitted, the diagrams were either traced or redrawn.



### *Editorial principles*

After the text of the letter, the name and address of the recipient are given (on one line, separated by commas), if they appear on the manuscript. Words written on by the recipient (preceded by the word *Endorsed*) are not recorded unless they are significant.

After each letter there is further information under four headings.

#### *Original*

This gives the location of the original manuscript, if known. If not, the words 'Not traced' appear.

#### *Printed*

This has 'In *Letters*, first edition', with an identifying number, if the letter was printed fully in the 1981 book. Short excerpts from many of the new manuscript letters appeared in my 1999 biography, *Erasmus Darwin: A Life of Unequalled Achievement*, and this is recorded as 'Short excerpt in 1999 *Life*', with a page number. For letters from printed sources, the original printed source is recorded. 'Unpublished' means 'unpublished, to the best of my knowledge'.

#### *Text*

The source of my text is stated.

#### *Notes*

I wished to avoid mutilating the texts of the letters by sprinkling them with superscript note numbers. I hope that notes on specific points can still quite easily be found, because most of the letters are short and the notes follow a standard sequence: first, information about the recipient of the letter, if necessary; second, a note on the dating, if it is doubtful; and then information about places, people and topics mentioned, in the same order as in the text. Nearly all the Midland place names in the letters are marked on the map (pages xxxiv–xxxv). For the people mentioned, dates of birth and death are given whenever possible; but it should be remembered that a few of the birth dates are likely to be in error, most often by one year.

This is a one-volume collection; so I had to be severe with peripheral material. First, as implied earlier, letters *to* Darwin are quoted only when they are significant. A second major exclusion occurs when an essay, poem or scientific paper is being sent as an enclosure, with a covering letter: only the letter is printed. The third important omission is detailed medical material. This exclusion applies to Darwin's medical prescriptions, of which about a hundred have survived as stand-alone manuscripts; others appear at the ends of letters to patients. These latter, and prescriptions within letters, are reduced to short summaries in square brackets. The same treatment is applied to medical detail inserted in letters to his doctor son Robert. I hope that, in the future, a doctor–historian might produce a separate book 'Medical letters and prescriptions of Erasmus Darwin': this would be quite substantial, if fully annotated.

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These exclusions debar nearly all the early ‘occasional verse’ sent by Erasmus as a teenager in letters to his family and friends. These letters were carefully copied out by his father Robert Darwin, who thought Erasmus had ‘a great genius for poetry’. Robert’s copies have been preserved in the senior branch of the family, descended from Erasmus’s elder brother William Alvey Darwin, and are part of a substantial deposit at Cambridge University Library, made by Christopher Darwin in 1999. This includes about a thousand lines of hitherto unknown verse by the young Erasmus. Only one of these poems qualifies for inclusion here, because it is a letter-in-verse: written when he was 15, it makes an exhilarating start to this collection of his letters.

### THE LETTERS AND THEIR LOCATIONS

#### *The number of letters*

The complete list of letters to each recipient (page xxiii) indicates a total of 457 letters. A stern critic might question a handful of these for having very few verbatim words, or even none at all. However, the real total may be greater because I have sometimes grouped together fragments that may belong to separate letters. It is fair to say that the total is about 460.

My 1981 edition of Erasmus Darwin’s letters included 272 letters and fragments, of which about 40 were very short fragments.

This new book therefore has about twice as many letters; and they are, on average, appreciably longer.

#### *The ‘new’ letters*

Most of these have come from Cambridge University Library. In 1990 the late George Pember Darwin donated seven large boxes of family papers, catalogued as DAR 227: among these were nearly 200 letters from Erasmus Darwin, most of them autograph, and most addressed to either Josiah Wedgwood or Erasmus’s son Robert. In 1999 came Christopher Darwin’s large deposit of family papers, already mentioned. This consisted of 67 notebooks, catalogued as DAR 267. Among other recent arrivals at Cambridge has been the longest and most metaphysical of all Erasmus Darwin’s letters, acquired by purchase in 2002 (DAR 268). In all, there are 216 letters from Cambridge University Library here, as compared with eight previously.

This new book also includes 36 ‘new’ manuscript letters from sources already known, and 16 such letters from 12 sources previously unknown to me. Printed books and journals have yielded six more letters.

However, there must be many further letters of Erasmus Darwin that I have failed to find, some in public collections and many more in private hands, either

*The letters and their locations*

passed down in families or passed on into obscurity via auctioneers tied by their code of confidentiality.

*Locations of the manuscripts*

Most of the manuscript-based letters in this book are held in public or institutional libraries or archives, which have all kindly given permission for publication. These repositories, sometimes with shortened names, are listed alphabetically below, with the designations of the letters held by each. The designation is printed in italics when the manuscript is a copy and not in Erasmus Darwin's hand. Brackets indicate that my text is based on copies from two different sources.

*Repositories holding manuscript letters*

- Aberdeen University Library, 70-1  
 American Philosophical Society, Philadelphia, Pa., 72-2, 74-1, 81-8, 87-10, 94-29, 99-1  
 Birmingham City Archives, 62-1, 63-1, 64-4, 64-5, 65-2, 66-3, 66-5, 67-3, 67-4, 68-5, 69-4, 71-1, 71-3, 74-4, 75-4, 77-1, 77-3, 77-4, 77-5, 78-1, 78-2, 78-3, 78-4, 81-1, 82-1, 82-11, 83-1, 84-2, 85-3, 88-21, 89-1, 89-3, 89-15, 89-20, 89-24, 90-1, 91-6, 93-1, 93-13, 94-1, 94-5, 94-7, 94-9, 94-10, 94-12, 94-13, 94-14, 94-19, 94-21, 94-23, 94-25, 94-26, 95-4, 95-7, 95-10, 95-13, 95-16, 95-19, 96-1, 96-8, 96-10, 00-2, 00-4, 00-16, 00-17 (total: 65)  
 Birmingham University Library, 82-7  
 Bodleian Library, Oxford, 55-1, 56-5, 56-8, 85-1, 91-16, 94-4, 94-28, 97-5, 98-6, 02-6  
 Botany Library, Natural History Museum, London, 81-11, 82-3, 86-12, 87-4, 87-9  
 British Library, London, 78-11, 79-4, 79-5, (87-14), 93-7, 96-6, 00-15  
 Cambridge University Library, 47-1, 48-1, 48-2, 48-3, 48-4, 49-1, 49-2, 49-3, 49-5, 49-6, 50-1, 54-2, 56-1, 56-2, 56-3, 56-4, 56-6, 56-7, 57-2, 57-3, 58-1, 59-1, 65-1, 66-1, 66-4, (67-1), 67-5, 67-6, 68-1, 68-2, 68-3, 68-4, 68-7, 68-8, 69-2, 70-2, 70-5, 71-2, 71-4, 71-5, 71-6, 71-7, 71-8, 72-1, 72-3, 72-4, 73-1, 73-2, 73-3, 74-3, (75-7), 76-1, (77-7), 78-5, 78-6, 78-8, 78-9, 78-10, 79-1, 79-2, 79-3, 79-6, 79-7, 79-9, 79-10, 79-11, 80-1, 80-2, 80-4, 80-6, 81-4, 81-7, 81-9, 82-4, 82-5, 82-6, 82-8, 82-10, 83-3, 84-1, 84-3, 84-4, 84-5, 84-6, 84-7, 84-8, 85-2, 85-4, 85-5, 85-6, 85-7, 85-8, 86-3, 86-4, 86-5, 86-6, 86-7, 86-8, 86-9, 86-10, 86-11, 86-13, 86-14, 86-15, 86-16, 86-16, 86-17, 86-18, 86-19, 86-20, 87-1, 87-2, 87-3, 87-5, 87-6, 87-7, 87-8, 87-11, 87-12, 87-13, (87-14), 87-15, 87-16, 87-17, 87-21, 88-1, 88-2, 88-3, 88-5, 88-6, 88-7, 88-8, 88-9, 88-10, 88-11, 88-12, 88-13, 88-14, 88-15, 88-16, 88-17, 88-18, 89-4, 89-5, 89-7, 89-8,

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Darwin Museum, Down House, Downe, Kent, 75-2, 75-3, 75-5, 80-5, 89-2, 02-2

Derby City Libraries, 91-2

Fitzwilliam Museum Library, Cambridge, 78-7, 81-10, 81-12, 81-14, 82-2, 91-15, 92-6, 95-1, 00-1, 00-21

Hampshire County Museums Service Library, Winchester, 81-13

Harvard University, Houghton Library, Cambridge, Mass., 84-9, 87-19, 02-3

Historical Society of Pennsylvania, Philadelphia, Pa., 69-3, 93-4, 96-12, 97-6

Huntington Library, San Marino, Calif., 81-5, 90-4, 92-2, 95-12

Keele University Library, Keele, Staffordshire, 67-2, 83-2, 89-16, 93-10, 93-11, 93-12, 94-2, 94-18, 95-2, 95-3, 96-2, 97-2, 97-3, 99-7, 00-12

Leicestershire Record Office, 96-18

Linnean Society of London, 81-6, 92-8

Liverpool City Libraries, 00-20

Manchester University, John Rylands Library, (*89-11*)

New York Public Library, 64-1, 74-2

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Wisbech and Fenland Museum, 54-4  
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THE RECIPIENTS

The recipients of the letters – 126 of them if all the ‘unknowns’ are different people – are listed below, with the designations of the letters they received. The 60 recipients whose portraits appear among the Plates are each marked with an asterisk.

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- Arden, Mrs Margaret Elizabeth 87-3, 87-13  
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- \*Darwin, William Alvey (brother) 48-2, 54-2
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- \*Garnett, Thomas 94-29
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 \*Withering, William 75-1, 75-2, 75-3, 75-5  
 Wright, Miss Mary 86-19

ABBREVIATIONS

The following abbreviations are used for books often cited in the notes. The place of publication is London unless otherwise indicated.

1999 *Life*

D. King-Hele, *Erasmus Darwin: A Life of Unequalled Achievement*. De la Mare, 1999.

*Alum. Cantab.*

J. A. Venn, *Alumni Cantabrigienses*. Part I, to 1751: 4 volumes. Part II, 1752–1900: 4 volumes. Cambridge University Press, 1922 and 1944.

*Alum. Oxon.*

J. Foster, *Alumni Oxonienses, 1715–1896*. 4 volumes. Parker, Oxford, 1888.

Craven, *Derbeians*

M. Craven, *Derbeians of Distinction*. Breedon Books, Derby, 1998.

Craven, *Derby*

M. Craven, *Derby: An Illustrated History*. Breedon Books, Derby, 1990.



*Abbreviations*

Craven, *Whitehurst*

M. Craven, *John Whitehurst of Derby*. Mayfield Books, Ashbourne, 1996.

Craven and Stanley

M. Craven and M. Stanley, *The Derbyshire Country House*. Revised edition, 2 volumes. Landmark Publishing, Ashbourne, 2002.

C. Darwin, *Autobiography*

*The Autobiography of Charles Darwin*, edited by Nora Barlow Collins, 1958.

C. Darwin, *Life of E. Darwin*

Charles Darwin, *The Life of Erasmus Darwin* [2nd. ed., Murray, 1887]. Page references are to the unabridged edition (edited by D. King-Hele), Cambridge University Press, 2002.

*DNB*

*Dictionary of National Biography*. 22 volumes up to 1901 [1885-1903].  
*Oxford Dictionary of National Biography*. 60 volumes. Oxford University Press, 2004.

*DSB*

*Dictionary of Scientific Biography*. 16 volumes. Scribner's, New York, 1970-80.

*Ec. Veg.*

E. Darwin, *The Economy of Vegetation* (Part I of *The Botanic Garden*). Johnson, 1791 (for 1792).

Edgeworth, *Memoirs*

R. L. and Maria Edgeworth, *Memoirs of Richard Lovell Edgeworth*. 2 volumes. Hunter, 1820. Reprinted by Irish University Press, Shannon, 1969.

*Fam. Min. Gent.*

*Familiae Minorum Gentium*. Volumes 37-40, Harleian Society Publications, 1894.

Galton

*Elizabeth Anne Galton*, edited by A. Moilliet. Leonie Press, Northwich, 2003.

*Genius of Erasmus Darwin*

*The Genius of Erasmus Darwin*, edited by C. U. M. Smith and R. Arnott. Ashgate, Aldershot, 2005.

*Gent. Mag.*

*Gentleman's Magazine*. Volumes 1-100, 1731-1830.

Glover, *Derby*

S. Glover, *History of the County of Derby*. 2 volumes. Mozley, Derby, 1829.

Hills, *Watt*

R. L. Hills, *James Watt*. 3 volumes. Landmark Publishing, Ashbourne, volume 1, 2002; volume 2, 2005.

IGI

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### *Style of references*

In the notes, references to one-volume books give the author, title and page number(s). For books having several volumes, the volume number is given in small Roman numerals, then the page number(s): for example, Wedgwood, *Letters* iii 273. The date of publication is also given, in brackets, for all books except much-reprinted classics and the books in the list of abbreviations.

References to periodicals normally give the title, volume number in bold type, and page number(s), followed by the date in brackets: for example, *Phil. Trans.* **78**, 43–52 (1788).

References to Darwin's poems give the Canto number in capital Roman numerals, followed by line numbers: for example, *Ec. Veg.* III 329–36.

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### *Introduction*

spellings in defiance of robotic spell-checkers. The book has been printed directly from the disks that she created.

The impetus for this new edition came in 1990, when the late George Pember Darwin donated thousands of family papers to Cambridge University Library. Patrick Zutshi, Head of Manuscripts at the Library, encouraged me to go through these manuscripts; among them there proved to be nearly 200 'new' autograph letters by Erasmus Darwin. Thanks to Godfrey Waller and the staff of the Manuscripts Room, I obtained high-quality photocopies of all these letters. The complete collection of manuscripts was superbly catalogued by Nick Gill as the DAR 227 series, and I included excerpts in my 1999 *Life* of Erasmus Darwin. During 1999, as mentioned on page xx, Christopher Darwin deposited further family papers, including a number of 'new' letters and poems by Erasmus Darwin. These papers have now been chronologically listed by Adam Perkins as DAR 267. I sincerely thank all those mentioned above for their essential contributions. For permission to publish the letters (216 in all) from these deposits, I am most grateful to William Darwin, Christopher Darwin and the Syndics of the Cambridge University Library.

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