

Ruskin House, 40 Museum Street, London, W.C.1



Messrs.

George Allen & Unwin Ltd.

*have pleasure in sending the accompanying
work for review. They request that
the notice should not be inserted be-
fore publication and they would
be glad to receive a copy of
the issue in which it
appears.*



Title Evolution of C. Dawson

Price 7/6 net

Date of publication

Servant of India

**THE EVOLUTION OF
CHARLES DARWIN**

THE EVOLUTION OF
CHARLES DARWIN

By
GEORGE A. DORSEY

LONDON
GEORGE ALLEN & UNWIN LTD.
MUSEUM STREET

First published in Great Britain 1928

Copyright in U.S.A.

All Rights Reserved

Printed in Great Britain by Phototype Limited, Epsom, Herts.

To the memory of Sir Francis,
third son of Charles and Emma
Darwin, whose editing of his
father's letters makes it possi-
ble to understand the evolution
of one of the greatest and no-
blest characters that ever lived

Mr. Darwin's character was chiefly marked by a certain grand and cheerful simplicity, strangely and beautifully united with a deep and thoughtful wisdom, which, together with his illimitable kindness to others and complete forgetfulness of himself, made a combination as lovable as it was venerable. . . . No man ever passed away leaving behind him a greater void of enmity, or a depth of adoring friendship more profound.

— ROMANES

None have fought better, and none have been more fortunate, than Charles Darwin. He found a great truth trodden underfoot, reviled by bigots, and ridiculed by all the world; he lived long enough to see it, chiefly by his own efforts, irrefragably established in science, inseparably incorporated with the common thoughts of men, and only hated and feared by those who would revile, but dare not. What shall a man desire more than this?

— HUXLEY

As an explanation of evolution Darwin's ideas still hold the field to-day, and subsequent work has necessitated less modification of them than of those of his contemporaries in physics and chemistry. Just as physiology has found no case of interference with the order of nature as revealed by physics and chemistry, the study of evolution has brought to light no principle which cannot be observed in the experience of ordinary life and successfully submitted to the analysis of reason.

— J. B. S. HALDANE

P R E F A C E

DARWIN came to manhood as a failure and for the remainder of his life struggled against illness, yet conceivably no one more benefited mankind and revolutionized human thought, or lived a more exemplary life. How was this possible? How could he so triumph over weak human nature as to make his life a pattern of serenity and his work an ideal of scientific endeavor? Darwin himself could not have answered, for he did not understand himself; but he did open the door to life, and made such an understanding possible.

To understand Darwin is to understand human beings. That must be my justification for this book—an attempt to describe a unique personality as seen through the door he opened to all who have eyes to see and whose vision is not narrowed by prejudice or restricted by convention. When that ever-increasing army of observers has ceased to observe, life's secrets will have been bared and death will have lost its sting.

There were no secrets in Darwin's life. The material available for observing the evolution of his personality is enormous. His own published letters fill several volumes, and his published works exceed seven thousand pages. To these must be added an extraordi-

narily valuable autobiographical sketch which he prepared for his family when he sensed the interest that would inevitably be directed toward him after death. Books about Darwin and his works fill libraries. Those which I have drawn upon freely and to which I am especially indebted, in addition to Darwin's own works, are:

The Life and Letters of Charles Darwin. Edited by his son, Francis Darwin. 2 vols.

More Letters of Charles Darwin. Edited by his son, Francis Darwin. 2 vols.

A Century of Family Letters. Edited by his wife, Emma Darwin. 2 vols.

Life and Letters of Thomas Henry Huxley. By his son, Leonard Huxley. 2 vols.

Alfred Russel Wallace, Letters and Reminiscences. By James Marchant.

Charles Darwin and the Origin of Species. By Edward Bagnall Poulton.

Charles Darwin. Memorial Notices reprinted from *Nature*.

While the lines I have used from these books may not always be quoted with literal exactness, none, I believe, distorts the meaning of the author.

I am also greatly indebted to Sir Arthur Keith and to Major Leonard Darwin, son of Charles Darwin, for valued suggestions and advice.

GEORGE A. DORSEY.

New York City,
January, 1927.

CONTENTS

	PAGE
Introduction: The Evolution of Personalities and Beliefs	I
CHAPTER	
I. Darwin's Mother Opened His Eyes to Nature	14
II. His Father Wanted Him to Be a Doctor— or a Preacher.	24
III. He Himself Preferred to Walk with Henslow	39
IV. The Voyage of the <i>Beagle</i>	55
V. Thereafter Science Claimed Him as Its Own	75
VI. He Married His Cousin and Lived Happily Ever After	86
VII. He Was the Understanding Father of Ten Children	104
VIII. He Became the Friend of All the World	127
IX. Meanwhile He Had Been Looking at Nature	150
X. What He Saw Astounded the World	181
XI. But the <i>Origin of Species</i> Weathered the Storm	198
XII. His Many Other Literary Children	223
XIII. He Had to Learn to Write	243
XIV. He Did Not Profess Christianity: He Lived a Christlike Life	257
XV. He Was a Great Benefactor of Mankind	272
Appendix I. Outline of Charles Darwin's Life	281
Appendix II. List of Works by Charles Darwin	289
Index	295

APPENDIX I

OUTLINE OF CHARLES DARWIN'S LIFE*

- 1809 Feb. 12th: Born at Shrewsbury.
- 1817 Death of his mother.
- 1818 Went to Shrewsbury School.
- 1825 Left Shrewsbury School.
- 1826 Oct.: Went to Edinburgh University. Read two papers before the Plinian Society of Edinburgh "at the close of 1826 or early in 1827."
- 1827 Entered at Christ's College, Cambridge.
- 1828 Began residence at Cambridge.
- 1831 Jan.: Passed his examination for B.A., and kept the two following terms.
Aug.: Geological tour with Sedgwick.
Sept. 11th: Went to Plymouth to see the *Beagle*.
Oct. 2d: "Took leave of my home."
Dec. 27th: "Sailed from England on our circumnavigation."
- 1832 Jan. 16th: "First landed on a tropical shore" [Santiago].
- 1833 Dec. 6th: "Sailed for last time from Rio Plata."
- 1834 June 10th: "Sailed for last time from Tierra del Fuego."
- 1835 Sept. 5th: "Sailed from west shores of South America."
Nov. 16th: Letters to Professor Henslow, read at a meeting of the Cambridge Philosophical Society.
Nov. 18th: Paper read before the Geological Society on Notes made during a Survey of the East and West Coasts of South America in years 1832-35.
- 1836 May 31st: Anchored at the Cape of Good Hope.
Oct. 2d: Anchored at Falmouth.
Oct. 4th: Reached Shrewsbury after an absence of five years and two days.

*From *More Letters of Charles Darwin*, edited by Francis Darwin.

- 1836 Dec. 13th: Went to live at Cambridge.
- 1837 Jan. 4th: Paper on Recent Elevation in Chili read.
 Mar. 13th: Settled at 36 Great Marlborough Street.
 Mar. 14th: Paper on *Rhea* read.
 May: Read papers on Coral Formation, and on the Pampas to the Geological Society.
 July: Opened first notebook on Transmutation of Species.
 March 13th to Nov.: Occupied with his Journal.
 Oct. and Nov.: Preparing the scheme for the Zoology of the Voyage of the *Beagle*.
 Working at Geology of South America.
 Nov. 1st: Read the paper on Earthworms before the Geological Society.
- 1838 Worked at the Geology of South America and Zoology of Voyage. "Some little species theory."
 March 7th: Read paper on the Connexion of certain Volcanic Phenomena and on the Formation of Mountain Chains, to the Geological Society.
 May: Health began to break down.
 June 23rd: Started for Glen Roy. The paper on Glen Roy was written in August and September.
 Oct. 5th: Began Coral paper.
 Nov. 11th: Engaged to be married to his cousin, Emma Wedgwood.
 Dec. 31st: "Entered 12 Upper Gower Street."
- 1839 Jan. 29th: Married at Maer.
 Feb. and March: Some work on Corals and on Species Theory.
 March (part) and April: Working at Coral paper.
 Papers on a Rock seen on an Iceberg, and on the Parallel Roads of Glen Roy.
 Published *Journal and Remarks*, being Vol. III of the *Narrative of the Surveying Voyages of H.M.S. Adventure and Beagle, etc.*
 For the rest of the year, Corals and Zoology of the Voyage.
 Publication of the *Zoology of the Voyage of H.M.S. Beagle*, Part II (Mammalia).
- 1840 Worked at Corals and the Zoology of the Voyage.
 Contributed Geological introduction to Part I of the *Zoology of the Voyage*.

- 1841 Publication of Part III of the *Zoology of the Voyage* (Birds).
 Read paper on Boulders and Glacial Deposits of South America, to the Geological Society.
 Published paper on a remarkable bar of Sandstone off Pernambuco, on the coast of Brazil.
- 1842 Publication of Part IV of *Zoology of the Voyage* (Fish).
 May 6th: Last proof of the Coral book corrected.
 June: Examined Glacier action in Wales.
 "Wrote pencil sketch of my Species Theory."
 July: Wrote paper on Glaciers of Caernarvonshire.
 Oct.: Began his book on Volcanic Islands.
- 1843 Working at *Volcanic Islands* and "some Species work."
- 1844 Feb. 13th: Finished *Volcanic Islands*.
 July to Sept.: Wrote an enlarged version of Species Theory.
 Papers on *Sagitta*, and on *Planaria*.
 July 27th: Began his book on the Geology of South America.
- 1845 Paper on the Analogy of the Structure of Volcanic Rocks with that of Glaciers. *Proc. R. Soc. Edin.*
 April 25th to Aug. 25th: Working at second edition of *Naturalist's Voyage*.
- 1846 Oct. 1st: Finished last proof of *Geological Observations on South America*.
 Papers on Atlantic Dust, and on Geology of Falkland Islands, communicated to the Geological Society.
 Paper on *Arthrobalanus*.
- 1847 Working at Cirripedes.
 Review of Waterhouse's *Natural History of the Mammalia*.
- 1848 Mar. 20th: Finished Scientific Instructions in Geology for the Admiralty Manual.
 Working at Cirripedes.
 Paper on Erratic Boulders.
- 1849 Health especially bad.
 Working at Cirripedes.
 March to June: Water-cure at Malvern.
- 1850 Working at Cirripedes.
 Published Monographs of Recent and Fossil Lepadidæ.
- 1852 Working at Cirripedes.

- 1853 Nov. 30th: "Royal Medal given to me."
- 1854 Published Monographs on Recent and on Fossil Balanidæ and Verrucidæ.
Sept. 9th: Finished packing up all my Cirripedes. "Began sorting notes for Species Theory."
- 1855 March-April: Experiments on the effect of salt water on seeds.
Papers on Icebergs and on Vitality of Seeds.
- 1856 May 14th: "Began, by Lyell's advice, writing Species Sketch."
Dec. 16th: Finished Chap. III.
Paper read to Linnæan Society, On Sea-water and the Germination of Seeds.
- 1857 Sept. 29th: Finished Chapters VII and VIII.
Sept. 30th to Dec. 29th: Working on Hybridism.
Paper on the Agency of Bees in the Fertilisation of Papilionaceous Flowers.
- 1858 March 9th: "Finished Instinct chapter."
June 18th: Received Mr. Wallace's sketch of his evolutionary theory.
July 1st: Joint paper of Darwin and Wallace read at the Linnæan Society.
July 20th to July 27th: "Began Abstract of Species book," i. e., the *Origin of Species*, at Sandown, I. W.
Paper on Bees and Fertilisation of Flowers.
- 1859 May 25th: Began proof sheets of the *Origin of Species*.
Nov. 24th: Publication of the *Origin*: 1,250 copies printed.
Oct. 2d to Dec. 9th: At the water-cure establishment, Ilkley, Yorkshire.
- 1860 Jan. 7th: Publication of Edit. II of *Origin* (3,000 copies).
Jan. 9th: "Looking over MS. on Variation."
Paper on the Fertilisation of British Orchids.
July and again in Sept.: Made observations on *Drosera*.
Paper on Moths and Flowers.
Publication of *A Naturalist's Voyage*.
- 1861 Up to July at work on *Variation under Domestication*.
April 30th: Publication of Edit. III of *Origin* (2,000 copies).
July to the end of year, at work, on Orchids.
Nov.: *Primula* paper read at Linnæan Society.
Papers on *Pumilio* and on Fertilisation of *Vinca*.

- 1862 May 15th: Orchid book published.
Working at *Variation*.
Paper on *Catastum* (Linnæan Society).
Contribution to Chapter III of Jenyns' Memoir of Henslow.
- 1863 Working at *Variation under Domestication*.
Papers on Yellow Rain, the Pampas, and on Cirripedes.
A review of Bates's paper on Mimetic Butterflies.
Severe illness to the end of year.
- 1864 Illness continued until April.
Paper on *Linum* published by the Linnæan Society.
May 25th: Paper on *Lythrum* finished.
Sept. 13th: Paper on Climbing Plants finished.
Work on *Variation under Domestication*.
Nov. 30th: Copley medal awarded to him.
- 1865 Jan. 1st: Continued at work on *Variation* until April 22d.
The work was interrupted by illness until late in the autumn.
Feb.: Read paper on Climbing Plants.
Dec. 25th: Began again on *Variation*.
- 1866 Continued work at *Variation under Domestication*.
March 1st to May 10th: At work on Edit. IV of the *Origin*.
Published June (1,250 copies).
Read paper on *Cytisus scoparius* to the Linnæan Society.
Dec. 22d: Began the last Chapter of *Variation under Domestication*.
- 1867 Nov. 15th: Finished revises of *Variation under Domestication*.
Dec.: Began papers on Illegitimate Unions of Dimorphic and Trimorphic Plants, and on *Primula*.
- 1868 Jan. 30th: Publication of *Variation under Domestication*.
Feb. 4th: Began work on *Man*.
Feb. 10th: New edition of *Variation under Domestication*.
Read papers on Illegitimate Unions of Dimorphic and Trimorphic Plants, and on *Verbascum*.
- 1869 Feb. 10th: "Finished fifth edition of *Origin*; has taken me forty-six days." Edit. V. published in May.
Working at the *Descent of Man*.

- 1869 Papers on the Fertilisation of Orchids, and on the Fertilisation of Winter-flowering Plants.
- 1870 Working at the *Descent of Man*.
Paper on the Pampas Woodpecker.
- 1871 Jan. 17th: Began the *Expression of the Emotions*.
Feb. 24th: *Descent of Man* published (2,500 copies).
April 27th: Finished the rough copy of *Expression*.
June 18th: Began Edit. VI of *Origin*.
Paper on the Fertilisation of *Leschenaultia*.
- 1872 Jan. 10th: Finished proofs of Edit. VI of the *Origin*, and "again rewriting *Expression*."
Aug. 22d: Finished last proofs of *Expression*.
Aug. 23d: Began working at *Drosera*.
Nov.: *Expression* published (7,000 copies, and 2,000 more printed at the end of the year).
Nov. 8th: "At Murray's sale 5,267 copies sold to London booksellers."
- 1873 Jan.: Correcting the Climbing Plants paper for publication as a book.
Feb. 3d: At work on *Cross-fertilisation*.
Feb. to Sept.: Contributions to *Nature*.
June 14th: "Began *Drosera* again."
Nov. 20th: Began *Descent of Man*, Edit. II.
- 1874 *Descent of Man*, Edit. II, in one volume, published (Preface dated September).
Coral Reefs, Edit. II, published.
April 1st: Began *Insectivorous Plants*.
Feb. to May: Contributed notes to *Nature*.
- 1875 July 2d: *Insectivorous Plants* published (3,000 copies); 2,700 copies sold immediately.
July 6th: "Correcting 2d edit. of *Variation under Domestication*." It was published in the autumn.
Sept. 1st (approximately): Began on *Cross and Self-Fertilisation*.
Nov.: Vivisection Commission.
- 1876 May 5th: "Finished MS., first time over, of *Cross and Self-Fertilisation*."
May-June: Correction of *Fertilisation of Orchids*, Edit. II.
Wrote his Autobiographical Sketch.
May and Nov.: Contributions to *Nature*.

- 1876 Aug. 18th: First proofs of *Cross and Self-Fertilisation*.
Nov. 10th: *Cross and Self-Fertilisation* published (1,500 copies).
- 1877 "All the early part of summer at work on *Different Forms of Flowers*.
July: Publication of *Different Forms of Flowers* (1,250 copies).
During the rest of the year at work on the bloom on leaves, movements of plants, "and a little on worms."
Nov.: LL.D. at Cambridge.
Second edition of *Fertilisation of Orchids* published.
Contributions to *Nature*, *Gardeners' Chronicle*, and *Mind*.
- 1878 The whole year at work on movements of plants, and on the bloom on leaves.
May: Contribution to *Nature*.
Second edition of *Different Forms of Flowers*.
Wrote prefatory letter to Kerner's *Flowers and Their Unbidden Guests*.
- 1879 The whole year at work on movements of plants, except for "about six weeks" in the spring and early summer given to the *Life of Erasmus Darwin*, which was published in the autumn.
Contributions to *Nature*.
- 1880 "All spring finishing MS. of *Power of Movement in Plants* and proof sheets."
"Began in autumn on *Worms*."
Prefatory notice written for Meldola's translation of Weismann's book.
Nov. 6th: 1,500 copies of *Power of Movement* sold at Murray's sale.
Contributions to *Nature*.
- 1881 During all the early part of the year at work on the "Worm book." Several contributions to *Nature*.
Oct. 10th: The book on *Earthworms* published: 2,000 copies sold at once.
Nov.: At work on the action of carbonate of ammonia on plants.
- 1882 No entries in the Diary.
Feb.: At work correcting the sixth thousand of the *Earthworms*.

1882 Mar. 6th and Mar. 16th: Papers on the action of Carbonate of Ammonia on roots, etc., read at the Linnæan Society.

April 6th: Note to *Nature* on Dispersal of Bivalves.

April 18th: Van Dyck's paper on Syrian Dogs, with a preliminary notice by Charles Darwin, read before the Zoological Society.

April 19th: Charles Darwin died at Down.

APPENDIX II

LIST OF WORKS BY CHARLES DARWIN*

- Narrative of the Surveying Voyages of her Majesty's Ship *Adventure* and *Beagle* between the Years 1826 and 1836, Describing Their Examination of the Southern Shores of South America, and the *Beagle's* Circumnavigation of the Globe. Vol. III. Journal and Remarks, 1832-1836. By Charles Darwin. 8vo. London, 1839.
- Journal of Researches into the Natural History and Geology of the Countries Visited during the Voyage of H.M.S. *Beagle* round the World, under the Command of Capt. Fitz-Roy, R.N. 2d edition, corrected, with additions. 8vo. London, 1845. (Colonial and Home Library.)
- A Naturalist's Voyage. Journal of Researches, etc. 8vo. London, 1860. (Contains a postscript dated Feb. 1, 1860.)
- Zoology of the Voyage of H.M.S. *Beagle*. Edited and superintended by Charles Darwin. Part I. Fossil Mammalia, London, 1840.
- Part II. Mammalia. London, 1839.
- Part III. Birds, by John Gould. London, 1841.
- Part IV. Fish. London, 1842.
- Part V. Reptiles. London, 1843.
- The Structure and Distribution of Coral Reefs. Being the First Part of the Geology of the Voyage of the *Beagle*. 8vo. London, 1842.
- The Structure and Distribution of Coral Reefs. 2d edition. 8vo. London, 1874.
- Geological Observations on the Volcanic Islands, Visited during the Voyage of H.M.S. *Beagle*. Being the Second Part of the Geology of the Voyage of the *Beagle*. 8vo. London, 1844.
- Geological Observations on South America. Being the Third Part of the Geology of the Voyage of the *Beagle*. 8vo. London, 1846.

*From *Life and Letters of Charles Darwin*, edited by Francis Darwin.

Geological Observations on the Volcanic Islands and Parts of South America Visited during the Voyage of H.M.S. *Beagle*. 2nd edition. 8vo. London, 1876.

A Monograph of the Fossil Lepadidæ; or Pedunculated Cirripedes of Great Britain. 4to. London, 1851. (Palæontographical Society.)

A Monograph of the Sub-class Cirripedia, with Figures of All the Species. The Lepadidæ; or, Pedunculated Cirripedes. 8vo. London, 1851. (Ray Society.)

—The Balanidæ (or Sessile Cirripedes); the Verrucidæ, etc. 8vo. London, 1854. (Ray Society.)

A Monograph of the Fossil Balanidæ and Verrucidæ of Great Britain. 4to. London, 1854. (Palæontographical Society.)

On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life. 8vo. London, 1859. (Dated Oct. 1, 1859, published Nov. 24, 1859.)

—Fifth thousand. 8vo. London, 1860.

—Third edition, with additions and corrections. (Seventh thousand.) 8vo. London, 1861. (Dated March, 1861.)

—Fourth edition, with additions and corrections. (Eighth thousand.) 8vo. London, 1866. (Dated June, 1866.)

—Fifth edition, with additions and corrections. (Tenth thousand.) 8vo. London, 1869. (Dated May, 1869.)

—Sixth edition, with additions and corrections to 1872. (Twenty-fourth thousand.) 8vo. London, 1872. (Dated Jan., 1872.)

On the Various Contrivances by which Orchids Are Fertilised by Insects. 8vo. London, 1862.

—Second edition. 8vo. London, 1877.

The Movements and Habits of Climbing Plants. Second edition. 8vo. London, 1875. (First appeared in the ninth volume of the "Journal of the Linnæan Society.")

The Variation of Animals and Plants under Domestication. 2 vols. 8vo. London, 1868.

—Second edition, revised. 2 vols. 8vo. London, 1875.

The Descent of Man, and Selection in Relation to Sex. 2 vols. 8vo. London, 1871.

—Second edition. 8vo. London, 1874. (In 1 vol.)

- The Expression of the Emotions in Man and Animals. 8vo. London, 1872.
- Insectivorous Plants. 8vo. London, 1875.
- The Effects of Cross and Self Fertilisation in the Vegetable Kingdom. 8vo. London, 1876.
- Second edition. 8vo. London, 1878.
- The Different Forms of Flowers on Plants of the Same Species. 8vo. London, 1877.
- Second edition. 8vo. London, 1880.
- The Power of Movement in Plants. By Charles Darwin, assisted by Francis Darwin. 8vo. London, 1880.
- The Formation of Vegetable Mould, through the Action of Worms, with Observations on Their Habits. 8vo. London, 1881.

LIST OF SCIENTIFIC PAPERS, ETC.

- Letters to Professor Henslow, read at the meeting of the Cambridge Philosophical Society, Nov. 16, 1835.
- Geological Notes Made during a Survey of the East and West Coasts of South America in the Years 1832, 1833, 1834, and 1835; with an Account of a Transverse Section of the Cordilleras of the Andes between Valparaiso and Mendoza.
- Notes upon the Rhea Americana. 1837.
- Observations of Proofs of Recent Elevation on the Coast of Chile, Made during the Survey of H.M.S. *Beagle*. 1838.
- A Sketch of the Deposits Containing Extinct Mammalia in the Neighbourhood of the Plata. 1838.
- On Certain Areas of Elevation and Subsidence in the Pacific and Indian Oceans, as Deduced from the Study of Coral Formations. 1838.
- On the Formation of Mould. 1838.
- On the Connexion of Certain Volcanic Phenomena and on the Formation of Mountain-Chains and the Effects of Continental Elevations. 1838.
- Origin of Saliferous Deposits. Salt Lakes of Patagonia and La Plata. 1838.
- Note on a Rock Seen on an Iceberg in 16° South Latitude. 1839.
- Observations on the Parallel Roads of Glen Roy, and of Other Parts of Lochaber in Scotland. 1839.

- On a Remarkable Bar of Sandstone off Pernambuco, on the Coast of Brazil. 1841.
- On the Distribution of the Erratic Boulders and on the Contemporaneous Unstratified Deposits of South America. 1842.
- Notes on the Effects Produced by the Ancient Glaciers of Caernarvonshire, and on the Boulders Transported by Floating Ice. 1842.
- Observations on the Structure and Propagation of the genus *Sagitta*. 1844.
- Brief Descriptions of Several Terrestrial *Planariæ*. 1844.
- An Account of the Fine Dust which Often Falls on Vessels in the Atlantic Ocean. 1846.
- On the Geology of the Falkland Islands. 1846.
- On the Transportal of Erratic Boulders from a Lower to a Higher Level. 1848.
- On British Fossil Lepadidæ. 1850.
- Analogy of the Structure of Some Volcanic Rocks with that of Glaciers. 1851.
- On the Power of Icebergs to Make Rectilinear, Uniformly Directed Grooves across a Submarine Undulatory Surface. 1855.
- Vitality of Seeds. 1855.
- On the Action of Sea-Water on the Germination of Seeds. 1856.
- On the Agency of Bees in the Fertilisation of Papilionaceous Flowers. 1857.
- On the Tendency of Species to Form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection. By Darwin and Wallace. 1859. (Read July 1, 1858.)
- On the Agency of Bees in the Fertilisation of Papilionaceous Flowers, and on the Crossing of Kidney Beans. 1858.
- Do the Tineina or Other Small Moths Suck Flowers, and If So What Flowers? 1860.
- Note on the Achenia of *Pumilio Argyrolepis*. 1861.
- Fertilisation of Vincas. 1861.
- On the Two Forms, or Dimorphic Condition, in the Species of *Primula*, and On Their Remarkable Sexual Relations. 1862.
- On the Three Remarkable Sexual Forms of *Catasetum tridentatum*. 1862.
- Yellow Rain. 1863.

- On the Thickness of the Pampean Formation near Buenos Ayres. 1863.
- On the So-called "Auditory-sac" of Cirripedes. 1863.
- On the Existence of Two Forms, and On Their Reciprocal Sexual Relation, in Several Species of the genus *Linum*. 1864.
- On the Sexual Relations of the Three Forms of *Lythrum salicaria*. 1865.
- On the Movement and Habits of Climbing Plants. 1867.
- Notes on the Fertilization of Orchids. 1869.
- On the Character and Hybrid-like Nature of the Offspring from the Illegitimate Unions of Dimorphic and Trimorphic Plants. 1869.
- Note on the Habits of the Pampas Woodpecker. 1870.
- Fertilisation of *Leschenaultia*. 1871.
- The Fertilisation of Winter-flowering Plants. 1869.
- Pangenesis. 1871.
- Inherited Instinct. 1873.
- Perception in the Lower Animals. 1873.
- Origin of Certain Instincts. 1873.
- Habits of Ants. 1873.
- On the Males and Complemental Males of Certain Cirripedes, and on Rudimentary Structures. 1873.
- Recent Researches on Termites and Honey-bees. 1874.
- Fertilisation of the Fumariaceæ. 1874.
- Flowers of the Primrose Destroyed by Birds. 1874.
- Cherry Blossoms. 1876.
- Sexual Selection in Relation to Monkeys. 1876.
- The Scarcity of Holly Berries and Bees. 1877.
- Note on Fertilization of Plants. 1877.
- A Biographical Sketch of an Infant. 1877.
- Transplantation of Shells. 1878.
- Rats and Water-Casks. 1879.
- Fertility of Hybrids from the Common and Chinese Goose. 1880.
- The Sexual Colours of Certain Butterflies. 1880.
- Sir Wyville Thomson and Natural Selection. 1880.
- The Omori Shell Mounds. 1880.
- Black Sheep. 1880.
- Movements of Plants. 1881.
- The Movements of Leaves. 1881.
- Inheritance. 1881.

Leaves Injured at Night by Free Radiation. 1881.

The Parasitic Habits of *Molothrus*. 1881.

On the Dispersal of Freshwater Bivalves. 1882.

The Action of Carbonate of Ammonia on the Roots of Certain
Plants. 1882.

The Action of Carbonate of Ammonia on Chlorophyll-Bodies.
1882.

INDEX

INDEX

- A Naturalist's Voyage Around the World*, its publication and great success, 72.
- Agassiz, his theory of the topographical formation of Scotland shows Darwin his own blunder, 83; bungling attack on *Origin of Species*, 186; letter to, suggesting borings in coral atolls, 226.
- Argyll, Duke of, a pall-bearer at Darwin's funeral, 273.
- Athenæum*, scathingly reviews *Origin of Species*, 184; letter to, on mutability of species, 221.
- Audubon, lecture attended by Darwin, 33.
- Barnacles, thousands of species examined, 169;
- Barnacles monograph, finished, 166; Darwin's greatest single work in zoology, 227.
- Bates, congratulated by Darwin, 146.
- Beagle*, Darwin's difficulty in obtaining his father's consent to the *Beagle* trip, 39, 48; sails from Plymouth, 54; the voyage, 55 ff.
- Birds, as disseminators of seeds of plants, 231; pairing of, after mate is killed, 236.
- Bishop of Oxford, controversy with Huxley over *Origin of Species*, 188, 190; discusses Draper paper before British Association for the Advancement of Science, 189, 190.
- Bower-Bird, experiment to determine if bird could distinguish colors, 234.
- Brazil, experiences in, 60 ff.
- British Association for Advancement of Science, discussion over *Origin of Species*, 188.
- Buckle, at the Darwin home, 99.
- Butler, Dr., master of school attended by Darwin, 28.
- Button, Jemmy, his return to savagery, 63.
- Cape Verde Islands, arrival at, 59.
- Carlyle, friend of the Darwins, 99.
- Chambers, Robert, in letter to, Darwin laments the skepticism of scientific men, 140.
- Chile, impressions of, 65.
- Chloroform, a "blessed discovery," 32, 109.
- Cigarettes, use of, acquired by Darwin while among the Patagonians, 101.
- Coral Reefs*, publication of, 83; hard work of preparation, 89; an important scientific work, 225.
- Cousins, marriage of, question of injurious consequences, 144.
- Cuvier, his theory of successive cataclysms, 151. . . .
- Darwin, Charles, outline of his life, 281; list of his works, 289.
- Darwin, Erasmus, grandfather of Charles Darwin, 18; his theory of "perpetual endeavour" as explanation of evolution, 218, 221.
- Darwin, Erasmus, brother of Charles Darwin, letter to on latter's illness, 91; writes appreciation of *Origin of Species*, 187.
- Darwin, Mrs. Charles, "The kindest of wives," 92; her comment on his illness, 93; her lifelong devotion, 98, 99, 100, 101, 277.
- Darwin, Robert Waring, father of Charles Darwin, 16, 19, 24 ff.
- Darwin, Susannah, mother of Charles Darwin, and her influence on his life, 14 ff., 276, 277.
- Darwin, Mount, named for the naturalist, 64.
- Darwin, Port, in Australia, 65.
- Darwin Sound, Tierra del Fuego, 65.
- De Vries, his "mutation theory," 216.
- Derby, Earl of, pall-bearer at Darwin's funeral, 273.
- Descent of Man*, theories borne out by modern discoveries, 237; amount received in royalties for, 256.
- Devonshire, Duke of, a pall-bearer at Darwin's funeral, 273.
- Distribution of plants and animals, experiments to determine, 230.
- Dorlodot, Canon, author *Darwinism and Catholic Thought*, 196.
- Down, Village of, home of Darwin, 94.
- Draper, offers controversial paper before Association for the Advancement of Science, 189.
- Drosera, remarkable experiments with, 229.
- Earthquakes, experienced in Chile, 65.
- Earthworms, habits of, success of the book on, 227.

- Edinburgh University, attended by Darwin, 30.
- Embryology, hypothesis of evolution an aid in its study, 245.
- Entomological Society of London, Darwin an original member, 43.
- Eugenics, Darwin's attitude toward, 143.
- Evolution, not a question of fact but of process, 3; effect of Lamarck's views on Darwin, 32; Darwin confides his belief to Hooker, 130; Lyell, a convert to the theory, 133; Asa Gray advances the cause in America, 135; explanation of Darwin theory, 198 ff. *Expression of the Emotions*, its publication, 241.
- Farrar, Canon, comment on theory of origin of species, 197; a pall-bearer at Darwin's funeral, 273.
- Fitz-Roy, Captain, commander of the *Beagle*, accepts Darwin for the trip, 51; their strong friendship, 52; returns to Tierra del Fuego, natives taken to England as hostages, 63; Darwin writes showing appreciation of opportunity of *Beagle* trip, 70; recommends publication of Darwin's notes, 71; at a discussion of Darwin's theory, 193.
- Formation of Mould, paper read before the Geological Society, 83; rewritten forty years later, 226.
- Fossil mammals, unearthed in Patagonia, 63, 71; influence on theory of origin of species, 154, 155, 161.
- Friendly Club, founded by Darwin, 119.
- Galapagos Islands, their curious fauna and flora, 66, 154, 156, 205.
- Geikie, his tribute to Darwin as a writer, 254.
- Geology, Mosaic versus scientific, 150 ff. *Geology of the Voyage of the Beagle*, Darwin's first important scientific work, 224.
- Glaciers, in South America, Darwin interested in report of, 147.
- Gladstone, comments on evolution of publication of *Origin of Species*, 3, 182.
- Grant, Dr., his views on evolution and their effect on Darwin, 32.
- Gray, Asa, in letter to, Darwin states a man of science should have no wife and children, 84; his long friendship with Darwin, 134; discussions on the Civil War, 136; advised of theory of origin of species, 169, 170; strong defence of Darwin, 186; letter to Hooker, praising the *Origin*, 196; letter to, on religious belief, 262.
- Green, John Richard, his version of Huxley's reply to the Bishop of Oxford, 191.
- Grote, friend of the Darwins, 99.
- Haeckel, Darwin's letter to, cautioning against excessive zeal for evolution, 269.
- Harvey, letter to, explaining Natural Selection, 212.
- Henslow, Professor, Darwin's studies in natural sciences with, 37 ff.; recommends Darwin for the *Beagle* trip, 40, 48; letters to, while on the voyage, 55, 65, 71; letter to, on arrival home, 80; visited, 81; his influence on Darwin's life far-reaching, 131; advises against Lyell's theory of geological formation, 152; comment on theory of origin of species, 189.
- Heredity, its influence on destiny, 4; in its relation to evolution, 210.
- Homeopathy, Darwin's attitude toward, 142.
- Hooker, Sir Joseph, his long friendship with Darwin, 93, 99, 128; on Darwin's defence of honest scientific workers, 145; letters to, regarding theory of origin of species, 163, 165, 167, 168, 169; speaks before Linnæan Society on Darwin and Wallace joint paper, 176; letters to, commenting on adverse criticism of the press on *Origin of Species*, 184, 185; reply to the Bishop of Oxford attack, 192; aids Darwin in his experiments, 233, 234; a pall-bearer at Darwin's funeral, 273.
- Horse, evolution of the, 203.
- Humboldt, influence on Darwin, 38, 44, 56, 60, 75; friendship with, 99.
- Huxley, letter to, complaining of illness preventing work, 92; his tribute to Darwin, 133; strong defence of Darwin, 186, 187, 188; victory over the Bishop of Oxford in discussion before British Association for the Advancement of Science, 188, 191; a pall-bearer at Darwin's funeral, 273.
- Immortality, attitude of Darwin toward, 264.
- Journal of the Voyage of the Beagle*, its publication, 72, 82.
- Kingsley, Rev. Charles, letter to Darwin, commenting on *Origin of Species*, 196.
- Lamarck, Darwin's attitude toward his theory of evolution, 163, 164; his book referred to by Darwin as "veritable rubbish," 217;—but "the justly celebrated naturalist applauded, 219.
- Lincoln, Abraham, comparison with Darwin, 5, 20, 90.
- Linnæan Society, presentation of joint paper of Darwin and Wallace, 176.

- Lizard eggs, experiments with, 231.
 Locusta, as seed carriers, 232.
London Times Literary Supplement, on Darwin's artistic sensibilities, 123.
 Lowell, James Russell, a pall-bearer at Darwin's funeral, 273.
 Lubbock, Sir John, long friendship with Darwin, 144; strong defence of Darwin, 186; Darwin's statement to, on the arguments against evolution, 214; pall-bearer at Darwin's funeral, 272.
 Lyell, Charles, his influence on Darwin, 82; letter to, announcing his engagement, 86; at the Darwin home, 99; life-long friendship with, 131; his *Principles of Geology*, an advance in method, 151; an inspiration for the *Origin of Species*, 152, 154; urges publication of hypothesis on origin of species, 167, 168, 172; speaks before Linnæan Society on Darwin and Wallace joint paper, 176; arranges with Murray for publication of *The Origin of Species*, 178; a tower of strength in defence of Darwin, 186.
 Macaulay, friend of the Darwins, 99.
 Malthus, influence on development of Darwin's theory, 153 ff.; on that of Wallace, 175.
 Mammoths, fossil bones found in Patagonia, 63, 71; influence on theory of origin of species, 154, 155, 161.
 Mesmerism, Darwin's attitude toward, 142.
 Millman, Dean, friend of the Darwins, 99.
 Monkeys, their "minds" compared with those of children, 240.
 Motley, friend of the Darwins, 99.
 Mould, Formation of, paper read before the Geological Society, 83; rewritten forty years later, 226.
 Murray, relations with Darwin as his publisher, 178, 255.
 Mutation, its part in evolution, 216.
Natural History Review, adverse and unfair criticism of *Origin of Species*, 184.
 Natural Selection, development of the theory, 156; Darwin thought term possibly misleading, 215.
 Orchids, baffling experiments with, 230.
Origin of Species, its reception by Church and university dignitaries, 3, 10; publication details, 178; explanation of the theory of evolution, 198 ff.; its success in many editions, 243; amount received from royalties, 256.
 Owen, Sir Richard, comments on *Origin of Species*, 188; comparison of brains of Man and Primate, 200.
Pall Mall Gazette, tribute to Darwin's humility, 269.
 Pangenesis, theory of, 211.
 "Parallel Roads of Gen Roy," an abandoned theory, 83.
 Pasteur, Darwin's admiration for his work, 268.
 Patagonia, impressions of, 62.
 Peacock feather, its development: sore point with Darwin, 213.
 Personalities, their evolution, 1.
 Pigeons, Darwins love for, 125.
Pithecanthropus erectus, its discovery in Java bears out the Darwinian theory, 201, 237.
 Preordination, Darwin's attitude toward, 262, 263.
Principles of Geology, an inspiration to Darwin, 152.
Quarterly Review, holds Darwin up to scorn on publication of the *Origin of Species*, 183.
 Religious belief, of Darwin, 257 ff.
 Romanes, experiments suggested for, to compare relative intellect of monkey and human, 240.
 St. Helena, Darwin puzzled over absence of certain plants on the island, 231.
 Scott, John, his experiments applauded by Darwin, 147.
 Scott, Sir Walter, presiding at Royal Society meeting attended by Darwin, 33.
 Sedgwick, his theory of the development of continents, 151; adverse criticism of *Origin of Species*, 185.
 Sexual selection, in the higher animals, experiments and observations, 235.
 Shellfish, their distribution in fresh water, 232.
 Slavery, Darwin's contact with, in Brazil, 61; his attitude toward, 132.
 Smith, Sidney, friend of the Darwins, 99.
 Snuff, "chief solace of life", 100.
 Spiritualism, Darwin's attitude toward, 142.
 Spottiswoode, William, a pall-bearer at Darwin's funeral, 273.
 Stanhope, Lord, belittles Darwin's scientific studies, 99.
Structure and Distribution of Coral Reefs, publication of, 83; hard work of preparation, 89; an important scientific work, 225.
 Sundew, experiments with, 229.
 Tahiti, impressions of, 67.
The Cell, author of complimented and encouraged by Darwin, 148.
The Times, tribute to Darwin, 273.
 Tierra del Fuego, impressions of, 62.

- Variation of Animals and Plants Under Domestication*, Darwin's treatise on heredity, 211, 223.
- Wallace, Alfred Russel, comment on Darwin's reasoning as a child, 14; long friendship with Darwin, 137; correspondence with, on origin of species, 171; forestalls Darwin in submitting same theory, 172; how his theory was evolved, 174; a pall-bearer at Darwin's funeral, 273.
- War, Darwin's attitude on, 136.
- Wedgwood, Emma, cousin of Darwin, whom he marries, 85, 86; letter to, 86; *See also* Darwin, Mrs. Charles
- Wedgwood, Josiah, maternal grandfather of Darwin, 18; induces Darwin's father to consent to the *Beagle* trip, 39, 48.
- Westminster Abbey, Darwin's funeral and burial in, 272.
- Wonders of the World*, influence of the book on Darwin, 11, 29, 44, 75.
- Writing, Darwin's effort for interesting style, 250 ff.