



**ON THE ORIGIN  
OF SPECIES . . . .**

by

**CHARLES DARWIN**

**A CENTENNIAL  
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## PREFACE

Lehigh University is fortunate in being able to commemorate the first publication of Darwin's *Origin of Species* in so handsome a way. The fact is that nowhere else in the world can one see this book displayed in such great depth: a page of the manuscript, the complete Page Proof, the first six English editions, and the first American edition. We therefore take this opportunity of expressing our thanks to Mr. Robert B. Honeyman, Lehigh, Class of 1920, for the generous loan of his unrivalled Darwin Collection.

JAMES D. MACK,  
LIBRARIAN.

July 14, 1959.

*Note:* The numbers of the items in this Catalogue indicate both the sequence of the publications and their relative positions in the cases of the Rare Book Room.

Charles Darwin and His *ORIGIN OF SPECIES*:  
A Centenary Appraisal

By Nicholas Rescher

The year 1848 is often referred to as a year of revolution. And in the field of political and social action, indeed it was. But in retrospect, 1859 seems fraught with even deeper change. For it was on November 24, 1859 that Charles Robert Darwin, then fifty years of age, published his book, *On the Origin of Species by Means of Natural Selection*. Against a background of mutability in human affairs, we celebrate Darwin's work for its enduring power.

Revolution in human knowledge can most appropriately be celebrated in the realm of ideas, in our devoting to it some moments of reflection and reappraisal. Let us then reflect on the nature of Darwin's revolution, and its portent for our understanding of the world we live in.

The character of the contribution made by Darwin continues to be the object of widespread misconceptions. To appreciate properly what Darwin in fact did, we must make very clear in our thinking one thing which he did not do. Darwin did not invent the theory of evolution. Evolution is a very historic idea, and not a child of the 19th century. Credit for the invention of the idea of evolution must go to Anaximander of Miletos, a Greek philosopher-scientist of the 6th century B.C., who taught that "Living creatures arose from the moist element as it was evaporated by the sun; man was like another animal, namely a fish, in the beginning." By Darwin's time, the concept of evolution had already enjoyed a long history. For years prior to the *Origin of Species*, evolution was very much in the air. Tennyson had already spoken of nature "red in tooth and claw," of the many seeds of which but one survive, and of the gradual biological emergence of man:

In tracts of fluent heat began,  
And grew to seeming-random form,  
The seeming prey of cyclic storms,  
Till at the last arose the man;  
Who throve and branched from clime to clime,  
The herald of a higher race,

• • •

Move upward, working out the beast,  
And let the ape and tiger die.

Darwin's contribution, then, was not the invention of the theory of evolution, but its establishment. Prior to his work, evolution was

simply a hypothesis, a theory which could be used to account for a body of known biological fact, and which did have some adherents. But when Darwin's work was done, this "hypothesis" had displaced all its competitors, and gained acceptance throughout the biological world.

Just exactly what did Darwin do to bring about acceptance of the theory of evolution? This question brings us to the very heart of Darwin's contribution. Prior to Darwin, there was one central problem which kept evolution on the plane of a purely theoretical possibility, a mere hypothesis: what is the governing mechanism for the evolutionary development of biological species? What could be the guiding force to direct the evolutionary development of a new species from older forms of life? Before admitting that evolution occurred, biologists wanted to know how it could occur.

To this problem, Darwin gave an answer at once brilliant and decisive. Horticulturists and animal breeders had long realized that it is possible to bring about new biological species possessing desirable qualities through supervised breeding of carefully selected individuals, that is, by artificial selection. Nature, argued Darwin, in fact does the same, so that we must also recognize the phenomenon of natural selection. Darwin shrewdly used Malthus' theory of population to provide the crucial factor. Malthus had maintained—with impressive evidence to support his view—that human and animal populations multiply in geometric proportion if unretarded, while the supply of plant food on which these populations are ultimately dependent increases in no more than arithmetic proportion. The result, Malthus taught, is a necessary "struggle for survival" among animal populations, resulting from mutual competition for a limited food supply. Darwin borrowed this Malthusian idea lock, stock, and barrel. It provided the basis for his concept of natural selection by the elimination of the "unfit" and the "survival of the fittest." The animal breeder seeking to reinforce "desirable" qualities selects his strains for guided reproduction. Nature, using the struggle for survival, selects her favorites, the fittest to survive. Drawing on Malthus, Darwin put into place the missing keystone of the governing mechanism of evolution: natural selection.

Darwin's theory of evolution was not a perfect and complete work, free from any need for improvement and refinement. As with all new scientific discoveries, it embodied defects which awaited further thought and research for their detection and removal.

One shortcoming of Darwin's theory revolved about the fundamental concept of "fitness" on which his thesis of the "survival of the fittest" is based. Just what is it that constitutes "fitness," other than survival itself? If there is no independent criterion of "fitness"—and no truly

adequate criterion came readily to hand—then the fittest are by definition those that survive, and the entire thesis of the “survival of the fittest” could become trivial. Modern biology has effectively circumvented this problem by inverting the Darwinian view of the relationship, tending to construe fitness in terms of survival itself (or better, survival probabilities), rather than the reverse. In this way, the crypto-teleological conception of a nature striving to advance the interests of “the fittest” gradually disappeared from post-Darwinian biology.

A second weakness of Darwin’s concept of evolution was its acceptance of Lamarck’s theory of the inheritance of acquired characteristics. In this respect, too, the modern theory of evolution is no longer Darwinian, but has been modified in the light of the science of genetics deriving from Mendel.

However great the biological impact of Darwin’s ideas—and their magnitude is scarcely capable of overemphasis—their impact in other spheres of thought was greater yet. A new “evolutionary ethics” grew out of Darwinism, based on the idea that struggle, competition, and their consequences, are “natural” and therefore good. Supporters of economic and imperialistic exploitation were quick to capitalize on these ideas. If the exploiting group or nation is “fitter”—and this, it was argued, must surely be so if they have reached a position in which exploitation is possible—then it is only “natural” and thus just, that it be allowed to have its way. Thus, for example, opponents of child labor, supporters of work-safety legislation, and critics of imperialism were all denounced by “Darwinists” as unscientific sentimentalists who are opposed to the “order of nature.” And, unfortunately, many victims of such criticism replied by attacking Darwinism and evolution, rather than the abuses involved in an overly glib application of biological theories to social and economic questions.

The liveliest opposition aroused by Darwin, however, centered about his views on the descent of man. Disdaining the policy of timid hints common among his biologist predecessors, Darwin forthrightly insisted on a return to the Greek view of putting man squarely into the order of animal nature. This stirred up a hornets’ nest of opponents outraged by the view that “man is descended from a monkey.” This opposition came, not from biologists (who had already seen the handwriting on the wall), but from theologians upset by the disagreement with the Genesis concept of the creation of man, and from moralists who felt that acknowledgment of man’s lowly origin could undermine morality. The heretical implications of Darwinism were shrewdly exploited by various anti-religious supporters of Darwin, among whom Thomas H. Huxley was the most prominent. And in the strident and

acrimonious debate that ensued between the orthodox and his own "supporters," Darwin himself gradually became more and more a "Darwinian."

In modern retrospect, the whole Darwinian dispute of "Science" versus "Religion" has an increasingly antiquated sound. The Christian and Judaic religions—their most obstinately fundamentalist branches excepted—once more accommodated themselves to a non-Genesis theory of the world. (They had already done so before, when, in the Middle Ages, they accommodated themselves to Aristotelian science.) Enlightened theologians again came to realize that the Genesis picture of the origin of the world is not really essential to religion. And moralists soon recognized that an admission of man's descent from a "monkey" is not grounds for maintaining that he ought to act like one. Religion and ethics made their peace with Darwinism—the scientific Darwinism of the biologists, if not the exaggerated pseudo-Darwinism of the Huxley-type propagandists.

All in all, there is no question that the centennial of Darwin's *Origin of Species* provides ample materials for thoughtful reappraisal. One of the most interesting is the illustration which it once again affords of the tremendous pressure which is exerted by a successful scientific idea for influence in other fields, beyond the proper sphere of its legitimate applicability. Newton's theory of gravitation, Freud's theory of the unconscious, and Schrödinger's theory of complementarity, are some of the other major instances of this phenomenon. Each is a theory so strikingly novel, and so impressively successful in its own domain, that the temptation to apply it in other spheres proved overwhelming. Sometimes such extra-disciplinary borrowing can be fruitful. But generally the elasticity of scientific ideas is limited, and when these limits are exceeded, baneful consequences ensue. The theory of evolution by natural selection through the "survival of the fittest" in a "struggle for existence" was a biologists' gold-mine. But its application to social and political questions, and to matters of economic policy, took place in an unwarranted and unfortunate way. And the use of Darwinism as a thing to conjure with in questions of ethics and religion was commonly carried through in a spirit of iconoclastic partisanship, quite willing to scatter the eager blows of its fury over foolishness and wisdom alike. To Darwin himself, of course, we must assign only the credit and not the blame. The creative inventor—as the instance of the humane Dr. Guillotin so decisively illustrates—cannot be blamed for the abuse of his work in the hands of overly zealous disciples. The lesson to be drawn is not one for the scientific genius who devises the breakthrough of innovation, but for the rest of us who are the heirs to his work.

# 1

## Henslow Letters

[Extracts from Letters addressed to Professor Henslow by C. Darwin, Esq.] Cambridge, December 1, 1835. Privately printed "for distribution among the Members of the Cambridge Philosophical Society . . ."

8vo. 31 p. Modern boards.

Charles Robert Darwin was born at Shrewsbury on February 12, 1809. He was therefore not yet twenty-three when he sailed as Naturalist on board *H. M. S. Beagle*. The ten letters contained in this very scarce pamphlet were written by Darwin during the *Beagle* voyage to Prof. John Stevens Henslow, of Cambridge University. It was Henslow who urged Darwin to apply for the position of Naturalist to the expedition. The first letter came from Rio de Janeiro, dated May 18, 1832; the last from Valparaiso, April 18, 1835, a few months before the *Beagle* quit the coast of South America for her journey to the westward around the world. All the letters have been reprinted in full in *The Life and Letters of Charles Darwin* (Ed. Francis Darwin, London, 1887; New York, 1896).

# 2

## Zoology of the Beagle

*The Zoology of the Voyage of H. M. S. Beagle, under the Command of Captain Fitzroy, R.N., During the Years 1832 to 1836.* Published with the Approval of the Lords Commissioners of Her Majesty's Treasury. Edited and Superintended by Charles Darwin, Esq. M.A. F.R.S. Sec. G.S. Naturalist to the Expedition. London: Published by Smith, Elder and Co., 65, Cornhill. 1839-1843.

3 vols. Folio. Contemporary boards. First edition.

Darwin did not actually write the three volumes on the Zoology of the *Beagle* voyage. For one thing, he disclaimed the knowledge requisite for the undertaking; for another, he was then occupied with the account of his geological observations. Instead, over a period of four years he served as general editor under the sponsorship of several scientific societies. For work on these volumes and the three on Geology (see below) Darwin had a subvention from the Government of £ 1000.

Darwin's statement of the object of this work gives a clear indication of the problem of Taxonomy confronting biologists a century ago: ". . . to give descriptions and figures of undescribed and imperfectly known animals, both fossil and recent, together with some account, in the one case, of their geological position, and in the other of their habits and ranges." The most famous contributor was John Gould, who devoted his lifetime to Ornithology on a world-wide stage.

### 3

#### **Voyage of the Beagle**

*Narrative of the Surveying Voyages of His Majesty's Ships 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.* In Three Volumes. London: Henry Colburn, Great Marlborough Street. 1839.

3 vols. 8vo. Original blue cloth. First edition.

Volume III: Journal and Remarks. 1832-1836. By Charles Darwin, Esq., M.A. Sec. Geol. Soc.

"The present volume contains in the form of a journal, a sketch of those observations in Geology and Natural History, which I thought would possess some general interest." [C.R.D.]

The second voyage of H. M. S. *Beagle* (1832-1836), on which Darwin sailed, had for its purpose the hydrographic survey of certain coastlines and navigational hazards in the Southern Hemisphere. It was, in fact, one of a succession of such expeditions, beginning with the first of Captain James Cook in 1768, continued through those of Vancouver, Flinders, and the *Challenger*. We have forgotten that the hydrographic data returned by the *Beagle* were of great value and importance in their day. The data are superseded; but more, Darwin's presence has obscured the larger purpose. It had long since been the practice at the Admiralty to place "scientific gentlemen" on board these survey vessels as supernumeraries. This, both for the acquisition of new scientific knowledge, and for the less altruistic function of (as the phrase went) "discovering any thing useful to the commerce and manufactures of the United Kingdom."

Because all of Darwin's subsequent achievements derive from these years at sea, it is probable that with the exception of Cook's first voyage, none of the Admiralty surveying expeditions ever matched the second of the *Beagle*.

### 4

#### **Journal of Researches**

*Journal of Researches into the Geology and Natural History of the Various Countries Visited by H. M. S. Beagle, under the Command of Captain Fitzroy, R.N. from 1832 to 1836.* By Charles Darwin, Esq., M.A. F.R.S. Secretary to the Geological Society. London: Henry Colburn, Great Marlborough Street. 1840.

8vo. xiv, 630, [609-615] p., maps, publisher's catalogue (August, 1839).

Original blue cloth. First edition.

*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.* By Charles Darwin, M.A., F.R.S. Author of 'Origin of Species,' etc. Tenth Thousand. London: John Murray, Albemarle Street. 1860.

8vo. xvi, 519 p. Original green cloth. Second edition.

Presentation copy to Mrs. Cameron, whom Darwin met on the Isle of Wight in 1868.

*Same.* New York: D. Appleton and Company, 549 & 551 Broadway. 1871.

8vo. x, 519 p., publisher's catalogue. Original brown cloth. First American edition.

With this publication of his own journal of the *Beagle* voyage as a separate, Darwin removed himself from the shadow of the Admiralty. Except for the new title, the first edition of the *Journal of Researches* is a second printing of Volume III of the *Narrative*. The book has been in print more or less continuously since its first appearance.

## 5

### Coral Reefs

*The Structure and Distribution of Coral Reefs. Being the First Part of the Geology of the Voyage of the Beagle, under the Command of Capt. Fitzroy, R.N. during the Years 1832 to 1836.* By Charles Darwin, M.A., F.R.S., F.G.S., Naturalist to the Expedition. Published with the Approval of the Lords Commissioners of Her Majesty's Treasury. London: Smith, Elder and Co., 65, Cornhill. 1842.

8vo. xii, 214 p., maps, publisher's catalogue (May, 1842). Original blue cloth. First edition. *Ex libris* John Clarke Hawkshaw.

The *Structure and Distribution of Coral Reefs*, first of Darwin's trilogy on the Geology of the *Beagle* voyage, was also his first scientific treatise. With his Subsidence Theory of reef-formation, Darwin revealed his capacity for formulating the immense generalization which, seventeen years later, the world would see on an even grander scale. This theory, now generally accepted, states that atolls and barrier reefs are formed on subsided rather than on uplifted portions of the earth's crust.

## 6 & 7

### Volcanic Islands and South America

*Geological Observations on the Volcanic Islands, Visited during the Voyage of H. M. S. Beagle, together with Some Brief Notices on the*

*Geology of Australia and the Cape of Good Hope. Being the Second Part of the Geology of the Voyage of the Beagle, under the Command of Capt. Fitzroy, R.N. during the Years 1832 to 1836.* By Charles Darwin, M.A., F.R.S., Vice-President of the Geological Society, and Naturalist to the Expedition. Published with the Approval of the Lords Commissioners of Her Majesty's Treasury. London: Smith, Elder and Co., 65, Cornhill. 1844.

8vo. viii, 175 p., with the map of Ascension Island. Original green cloth. First edition.

*Geological Observations on South America. Being the Third Part of the Geology of the Voyage of the Beagle, under the Command of Capt. Fitzroy, R.N. during the Years 1832 to 1836.* By Charles Darwin, M.A., F.R.S., F.G.S. Naturalist to the Expedition. Published with the Approval of the Lords Commissioners of Her Majesty's Treasury. London: Smith, Elder and Co., 65, Cornhill. 1846.

8vo. [viii], 279 p., maps and plates.  $\frac{1}{4}$  Morocco. First edition.

These two volumes form the last of Darwin's systematic observations from the *Beagle* voyage. Neither has achieved the stature among professional geologists reached by the *Structure and Distribution of Coral Reefs*. Darwin's authorities here are standard, and his interpretations sound and orthodox.

## 8 & 9

### Barnacles

*A Monograph on the Fossil Lepadidæ, or, Pedunculated Cirripedes of Great Britain.* By Charles Darwin, F.R.S., F.G.S. London: Printed for the Palæontographical Society. 1851.

4to. xvi, 88 p., 5 plates. Paper wrappers. First edition. [Bound with:]

*A Monograph on the Fossil Balanidæ and Verrucidæ of Great Britain.* By Charles Darwin, F.R.S., F.G.S. London: Printed for the Palæontographical Society. 1854.

4to. [iv], 44, 2 p., 2 plates. First edition.

*A Monograph of the Sub-class Cirripedia, with Figures of all the Species.* By Charles Darwin, F.R.S., F.G.S. The Lepadidæ; or, Pedunculated Cirripedes. London: Printed for the Ray Society. MDCCCLI.

8vo. xii, 400 p., 10 plates. Original blue cloth. *Ex libris* Herbert McLean Evans.

While Darwin was in Chile on the *Beagle* voyage, he came across the shell of a Cirripede (Barnacle), of the Class, Crustacea, unknown to himself. His work on the specimen led him to devote some eight years

to a comprehensive study of the subject. The results of his labors are shown here. The Lepadidae are the Stalked Barnacle; the Balanidae, the Sessile Barnacle.

Darwin later thought this work useful in writing the *Origin*, but doubted it was worth the time he had given to it.

## 10

### Darwin and Wallace

"On the Tendency of Species to form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection. By Charles Darwin, Esq., F.R.S., F.L.S., & F.G.S., and Alfred Wallace, Esq. Communicated by Sir Charles Lyell, F.R.S., F.L.S., and J. D. Hooker, Esq., M.D., V.P.R.S., F.L.S., &c.," Linnean Society, *Journal of the Proceedings*, III, No. 9, Section I, Zoological Papers, pp. 45-62 (Aug. 20, 1858).

Unbound, as issued.

In 1844, at the age of thirty-five, Darwin wrote out a "sketch" on this subject which, though circulated among a few friends, remained unpublished. Then, on September 5, 1857, he wrote a letter to the American botanist, Asa Gray, giving Gray the substance of his argument. In February 1858, Alfred Russel Wallace, writing from Ternate in the Dutch East Indies, sent Darwin a manuscript called, "On the Tendency of Varieties to depart indefinitely from the Original Type." Point for point Wallace had run his line of thought parallel to Darwin's. Darwin of course recognized the conflict of priority instantly, and placed the case in the hands of Sir Charles Lyell and Joseph Dalton Hooker, men of great prestige in the world of learning. The result was this joint publication of what may be called the Prologue to the *Origin of Species*. The highly dramatic episode is frequently cited both for the astonishing coincidence, and for the predisposition of both Wallace and Darwin to fair play.

The logic of the papers is beautifully simple. Under the pressure of numbers, those individuals of any species which are even infinitesimally better organized from birth to secure food and provide for their own safety, breeding, pass on their advantages to their progeny. Over prodigious periods of time, such inherited characteristics become accentuated until a wholly new species may be said to have arisen.

The double paper was read to the Linnean Society on July 1, 1858.

## On the Origin of Species

A. Single holograph page of *Origin of Species*, given to Lehigh University by Mr. Honeyman.

Light-blue paper, 8" x 13 $\frac{1}{8}$ ". Bound in full red Morocco.

Reference is made to pages 185-6 of the first edition, where Darwin is discussing the problem of relating animal habit to body structure.

The manuscript of *Origin* was distributed, some of it for family scratch-paper. Extant pages are apparently so scarce that a census of them could and should be made.

### B. Proof Copy.

Because Darwin distributed the manuscript of the *Origin*, the earliest possible version of the complete text must be the Proof Copy. One of the great stars of the Honeyman Collection in the History of Science, that unique Proof is shown here.

Collation is as follows: (A)4, (b)1, B-Y12.

This copy is most accurately described as the complete, final page proof. All corrections and notations are in Darwin's hand. As he completed the proofreading of each signature, Darwin noted both the number of the proof-revision, and the date of his release. From this we can establish that his reading of these signatures began on or about July 16, 1859, and ran to October 10. All except the first—(A)4, (b)1, "First Rev. October 8, 1859"—and the last two—X12, "Fourth Rev. Oct. 10", and Y12, "Third Rev. Oct. 10"—went through on two readings, done on eleven different dates. Thus, final printing, binding, and distribution of the first edition for sale required forty-four days.

Practically all proofreaders' marks on this copy relate to printer's errors; page-by-page study reveals no substantive alterations. It is interesting, however, to compare the holograph page described above with the Proof. Although the manuscript shows few deletions, numerous changes to the text were authorized at some time between submission of the manuscript and the printing of this proof. They were made presumably on the galley.

### C. The Several Editions.

*On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.* By Charles Darwin, M.A., Fellow of the Royal, Geological, Linnæan, etc., Societies; Author of 'Journal of Researches during H. M. S. Beagle's Voyage Round the World.' London: John Murray, Albemarle Street. 1859.

8vo. x, 502 p., publisher's catalogue (June, 1859). Original green cloth. First edition. Dated October 1st, 1859; [published November 24, 1859].

*Same*, 1860. Publisher's catalogue (January, 1860). Original green cloth. [Second edition], Fifth Thousand.

*Same*, 1861. xix, 538 p., publisher's list. Original green cloth. Third edition, with additions and corrections. (Seventh Thousand) *Ex libris* Herbert McLean Evans.

*Same*, 1866. xxi, 593 p., publisher's catalogue (January, 1865). Original green cloth. Fourth edition, with additions and corrections. (Eighth Thousand) *Ex libris* Charles Atwood Kofoid, Herbert McLean Evans.

*Same*, 1869. xxiv, 596 p. Original green cloth. Fifth edition, with additions and corrections. (Tenth Thousand) *Ex libris* George Hyde Wollaston, Charles Atwood Kofoid, Herbert McLean Evans.

*Same*, 1878. xxi, 458 p. Original green cloth. Sixth edition, with additions and corrections to 1872. (Twentieth Thousand) *Ex libris* Charles J. Wilson.

*Same*. New York: D. Appleton and Company, 346 & 348 Broadway. M.DCCC.LX.

432 p. Original brown cloth. First American edition. William Cullen Bryant's copy.

In 1839 Darwin began his first notebook on the subject of the variability of species. Then, as noted above, in 1844 he wrote his lengthy sketch—some 230 manuscript pages. By 1856, under Lyell's urging, he was ready to begin a full treatment of the problem "on a scale three or four times as extensive as that which afterwards followed in my *Origin of Species*." As soon as Wallace's paper appeared, both Lyell and Hooker advised Darwin to prepare a single-volume monograph. This abstract was done in thirteen months and ten days, and appeared on November 24, 1859.

The first edition of 1,250 copies sold out on the first day. A second edition appeared on January 7, 1860. It was not until the third edition that Darwin felt he must write a Preface giving the historical development of the Theory. By 1872 the twentieth thousand of copies had been printed.

## 12

### Louis Agassiz

Louis Agassiz, "Contributions to the Natural History of the United States," *American Journal of Science and Arts*, XXX (July, 1860).

A 15-page extract, dated Cambridge, Mass., June 30, 1860. Unbound; presented to "Professor Washburn [Emory Washburn, Governor of Massachusetts, and Professor of Law at Harvard] from the Author." Also has signature of Emory Washburn, Jr. on wrapper.

"The third volume of this work, now in the press, will appear shortly. We copy from the advance sheets the following paragraphs relating to

the origin of species, which has lately attracted much attention, in consequence of the publication of Darwin's book on that subject."

To the end of his life Louis Agassiz, celebrated Swiss naturalist and paleontologist, refused to accept the Darwinian theory. This extract confronts Evolution with the Theistic "Argument from Design." Several passages seem worth quoting:

"... there runs throughout Nature unmistakable evidence of thought, corresponding to the mental operations of our own mind, and therefore intelligible to us as thinking beings, and unaccountable on any other basis than that they owe their existence to the working of intelligence; and no theory that overlooks this element can be true to nature." Again—

"The criterion of a true theory [i.e., any scientific theory] consists in the facility with which it accounts for facts accumulated in the course of long-continued investigation and for which the existing theories afford no explanation. It can certainly not be said that Darwin's theory will stand that test." Again—

"Until the facts of Nature are shown to have been mistaken by those who have collected them, and that they have a different meaning from that now generally assigned to them, I shall therefore consider the transmutation theory as a scientific mistake, untrue in its facts, unscientific in its method, and mischievous in its tendency."

## 13

### The Primrose

"On the Two Forms, or Dimorphic Condition, in the Species of *Primula*, and on their Remarkable Sexual Relations," Linnean Society, *Journal of the Proceedings*, VI: 77-96 (1862).

Offprint. Modern boards.

Darwin was now world-famous; the Great Debate had begun. Instead of permitting himself to become embroiled, however, he seems to have quietly resumed the course of his scientific investigations. We note, however, an apparent shift of interest. Whereas he had formerly given his time to Geology and Zoology, he now turned to Botany. More specifically, he began a study of the sexual processes of plants. The present article concerns the two forms of Primrose, Cowslip and Oxlip.

## 14

### Fertilization of Orchids

#### Proof Copy and First Edition

*On the Various Contrivances by which British and Foreign Orchids are Fertilised by Insects, and on the Good Effects of Intercrossing.* By

Charles Darwin, M.A., F.R.S., &c. With Illustrations. London: John Murray, Albemarle Street. 1862.

8vo. vi, 365 p., publisher's catalogue (December, 1861). Original brown cloth; unopened. First edition.

In the *Origin* Darwin had laid down the doctrine that plants and other organisms require occasional cross-fertilization for their survival. His critics had charged him with failure to document this position. Consequently he decided to amplify his views, choosing for the purpose the study of the Orchid. In the Preface, Darwin gave a second motive for writing this book: "This treatise affords me also an opportunity to show that the study of organic beings may be as interesting to an observer who is fully convinced that the structure of each is due to secondary laws, as to one who views every trifling detail of structure as the result of the direct interposition of the Creator." A fairly strong statement from so mild a man.

Again we have the combination of a complete Page Proof and a first edition. This is Darwin's first revision of page proof, read during March and April, 1862. From the number of typographical errors corrected here by Darwin, we must assume—or at least hope—that he had another opportunity to read proof before releasing copy to the printer.

## 15

### On Flax

"On the Existence of Two Forms, and on their Reciprocal Sexual Relation, in Several Species of the Genus *Linum*," *Linnean Society, Journal of the Proceedings*, VII: 69-83 (1863).

Offprint. Modern boards. Inscription, "From the Author," in Darwin's hand, on front wrapper.

Here is another article on the fertilization of plants, this on the Crimson-flowered Flax.

## 16

### Climbing Plants

*On the Movements and Habits of Climbing Plants*. By Charles Darwin, Esq., F.R.S., F.L.S., etc. [From the *Journal of the Linnean Society*.] London: Sold at the Society's Apartments, Burlington House; and by Longman, Green, Longman, Roberts & Green, and Williams and Norgate. 1865.

8vo. [ii], 118 p. Paper wrappers. (Appeared in *Linnean Society, Journal of the Proceedings*, IX: 1-118 (1867).)

Darwin's account of the preparation of this monograph gives us an insight into his inquisitive mind. After reading a short paper on the

subject by Asa Gray, he began a collection of various climbers. A study of the article shows the fascinating ingenuity in experiment Darwin could bring to bear on a problem of this kind. His conclusions, though clearly not earth-shaking, demonstrate his formidable capacity for infinite detail.

## 17

### Domestication

Proof Copy, First Edition,  
Dutch and German Translations

*The Variation of Animals and Plants Under Domestication.* By Charles Darwin, M.A., F.R.S., &c. In Two Volumes. With Illustrations. London: John Murray, Albemarle Street. 1868.

2 vols. 8vo. Original green cloth. First edition.

*Het Variëeren der Huisdieren en Cultuurplanten*, door Charles Darwin. Naar de Tweede Herziene uitgaaf uit het Engelsch Vertaald en met aantekeningen voorzien door Dr. H. Hartogh Heys van Zouteveen. Arnhem-Nijmegen—Gebr. E. & M. Cohen. [n.d.] (Darwin's Biologische Meesterwerken, voor Nederlanders Bewerkt door Dr. H. Hartogh Heys van Zouteveen en Dr. T. C. Winkler.)

2 vols. 8vo. Original illustrated covers. *Ex libris* Charles Atwood Kofoid.

*Das Variieren der Thiere und Pflanzen im Zustande der Domestication* von Charles Darwin. Aus dem Englischen übersetzt von J. Victor Carus. In zwei Bänden. Stuttgart. E. Schweizerbart'sche Verlagshandlung (E. Koch). 1873.

2 vols. 4to. Contemporary boards. *Ex libris* Charles Atwood Kofoid.

*Animals and Plants under Domestication* has been called the second most important of Darwin's works. It would perhaps be more accurate to say that it is an amplification of Chapter I of the *Origin*.

Darwin had long been troubled by Lamarck's views on the inheritance of acquired characteristics. His answer, the highly tentative hypothesis of Pangenesis, appears in volume II of this work. It is a somewhat casuistical argument—he seems almost to have been writing to himself—implying that “the whole organization [i.e., of an individual] in the sense of every atom or unit, reproduces itself.” The theory has not been sustained by genetic evidence.

Darwin began this work in 1860, just after the publication of the *Origin*. He calculated that the writing required four years and two months, the other four years until publication being taken up by either illness or other work. At the end, he nearly withdrew the treatise because of its length; but a first printing of 1,500 copies was quickly followed by a second of 1,250.

The page proof is that of the first edition, with the first signature of each volume corrected for the second printing.

## 18

### Hybridization

"On the Character and Hybrid-like Nature of the Offspring from the Illegitimate Unions of Dimorphic and Trimorphic Plants." Reprint from Linnean Society, *Journal, Botany*, X: 393-437 (1869).

Modern boards. Inscription, "From the Author," in Darwin's hand, on front wrapper.

"On the Specific Difference between *Primula veris*, Brit. Fl. (var. *officinalis* of Linn.), *P. vulgaris*, Brit. Fl. (var. *acaulis*, Linn.), and *P. elatior*, Jacq.; and on the Hybrid Nature of the common Oxlip. With Supplementary Remarks on naturally-produced Hybrids in the genus *Verbascum*." Reprint from Linnean Society, *Journal, Botany*, X: 437-454 (1869).

Modern boards.

"Notes on the Fertilization of Orchids." Offprint from, *Annals and Magazine of Natural History*, 4th ser., IV: 141-159 (September, 1869).

Modern boards. Inscription, "From the Author," in Darwin's hand, on front wrapper.

Considered as a group, these three papers represent a continuation of previous work. The first contains the results of thirty-three experiments Darwin performed to determine the fertility of hybrids. The principal subject was the Primrose. The second paper presents evidence for the specific difference between three kinds of Primrose, as distinct from their mere variation.

Finally, in the "Notes on the Fertilization of Orchids," Darwin was simply bringing his book (Item 14 *supra*) on the subject up to date, and correcting some of its errors.

It is of incidental interest that in neither of the first two papers does Darwin refer to the relevant work by Gregor Mendel on plant-hybridization (1865).

## 19

### Descent of Man

*The Descent of Man, and Selection in Relation to Sex.* By Charles Darwin, M.A., F.R.S., &c. In Two Volumes. With Illustrations. London: John Murray, Albemarle Street. 1871.

2 vols. 8vo. Vol. II has Errata on verso of title-page. Original green cloth. First edition, first issue. *Ex libris* Herbert McLean Evans.

*Same.* Vol. II has list of Darwin's publications on verso of title-page. Original green cloth. First edition, second issue.

Same. New York: D. Appleton and Company, 549 & 551 Broadway. 1871.

2 vols. 8vo. Original red-brown cloth. First American edition. *Ex libris* Charles Atwood Kofoid.

It will be recalled that the *Origin of Species* was, from Darwin's point of view at least, little more than a hurriedly published abstract of his materials. With the *Orchids* and the *Variation of Animals and Plants under Domestication*, he began enlarging upon the more important areas of the problem. A similar motive prompted his *Descent of Man*, for in the *Origin* he had written that, by that work, "light would be thrown on the origin of man and his history." Here is the controversial implication that Man as such must be counted a natural animal, descended from other forms, and not, as "Soapy Sam" Wilberforce and others had argued, a special creature of God.

The "Descent of Man" forms Part I of this work. Part II, "Selection in Relation to Sex," not a particularly important work, explains the function of male characteristics [e.g., of the butterfly] in the processes of natural selection and transmutation.

## 20

### Expression of the Emotions

*The Expression of the Emotions in Man and Animals.* By Charles Darwin, M.A., F.R.S., &c. With Photographic and Other Illustrations. London: John Murray, Albemarle Street. 1872.

8vo. vi, 374 p., publisher's catalogue (November, 1872). Original green cloth. First edition.

In his autobiography, Darwin relates how, when his first child was born in 1839, he at once began making notes on his son's various facial expressions. He felt, he says, that "the most complex and fine shades of expression must all have had a gradual and natural origin." While at first glance, therefore, this work appears to have been a wide digression from Darwin's preoccupation, it was in fact an elaboration of it.

It is reported that 5,267 copies of this book were sold on the day of publication.

## 21

### Insectivorous Plants

*Insectivorous Plants.* By Charles Darwin, M.A., F.R.S., etc. With Illustrations. London: John Murray, Albemarle Street. 1875.

8vo. x, 462 p. Original green cloth. First edition.

It is well known that Darwin's successes as a theoretician depended ultimately upon his unusual ability as a field-naturalist. This strength is perhaps nowhere better shown than in his work on insect-catching plants.

Darwin's interest in the subject was awakened while he was on holiday—he was apparently never “idle”—in 1860. This was not entirely new ground for botanists, but over the next sixteen years he managed to perform numerous significant experiments on such plants, largely the Sundew (*Drosera*). These experiments dealt with the three principal characteristics peculiar to the species: sensitivity of the plant to the infinitely slight pressures of insects alighting on them; transmission of motor impulses within the plant tissues; and the digestive processes of these organisms.