Notes on Collections of the University of Toronto Library

Charles Darwin

2

May 2. 1873

Sir

I am very much obliged to you for your kindness in having sent me the account of the silk-worms, which I have read with great interest. I quite agree with your remarks on the benefit derived from a change of conditions. You do not state that you require the Gazette to be returned, & I will therefore keep it unless I hear to the contrary —

Dear Sir

yours faithfully & obliged

Ch. Darwin

Species of *Origin*; a bibliographical exposition of the works of Charles Darwin at the University of Toronto

Richard G. Landon

University of Toronto Library 1971

Charles Darwin, early in his career, remarked in a letter to John Maurice Herbert that he had 'long discovered that geologists never read each others works, and that the only object in writing a book is a proof of earnestness, and that you do not form your opinions without undergoing labour of some kind'.[1] From the time he returned from the Beagle voyage until his death in 1882 Darwin laboured steadily. His total production was twenty books and three pamphlets. He also contributed to eight books and one pamphlet. Since his death, the total number of his works has been augmented with the publication of his letters, notebooks, diaries and manuscripts left unfinished by him. A number of his papers were published by the scientific periodicals of his time and about ninety communications to learned societies were received from him. Almost every one of Darwin's books appeared in more than one edition and almost every edition had textual revisions of great importance. Many of the editions were further subdivided into 'issues' or, as his principal English publisher, John Murray, called them 'thousands', and there were often small changes made between the thousands. Because of this kind of publishing history, a complete collection of Darwin's works, which would seem comparatively small at first glance, becomes quite extensive. To the basic collection of books by Darwin are added books and pamphlets about him, or Darwiniana. This category also includes books by his immediate predecessors who explored the concept of evolution; books by his contemporaries working in the same area of study; books by his supporters and detractors; and modern books about his life and work. A total collection thus becomes very extensive indeed. The Charles Darwin Collection in the Rare Books and Special Collections Department of the University of Toronto Library contains between two and three thousand volumes and is growing at a steady rate. This paper attempts to delineate the scope of the collection and the relationships of its constituent parts. Occasionally a particular edition or translation is mentioned which is not yet held by the collection. No collection of books can ever really be called 'complete', particularly one concerned with a subject about which new books still appear regularly.

This collection was originally formed by Mr. Richard B. Freeman of University College London, who used it to compile *The Works of Charles Darwin, an annotated bibliographical handlist* (London, Dawsons of Pall Mall, 1965). This is the only bibliographical work thus far to consider the

[1]Darwin, Charles, *The Life and letters* (London, Murray, 1888), v. 1, pp. 334–335.

whole compass of Darwin's work. The range of Darwin's observations and experiments and the process of extensive textual revision undergone by the texts between the time they were written and Darwin's death are well illustrated by Freeman's bibliography. Often the revisions are of considerable scientific importance and the great strength of this collection is its inclusion of many variant editions and issues of a text. It is known, for instance, that while the most extensive revisions of *Origin of Species* were made for the five editions which appeared after the first of 1859, Darwin was also able to make small changes between the thousands which were published between some of the editions. The collection thus contains approximately one hundred and forty copies of *Origin of Species*, ranging from the first edition of 1859 to the 1963 Oxford 'World's Classics' edition, and all different in some way.

The *Journal of researches*, or, as it has become commonly known, *The Voyage of the Beagle*, was Darwin's personal record of his journey around the world and his first major work. It has correctly assumed its place as a key book for those who would attempt to understand the process by which Darwin gathered evidence and developed his concept of evolution. The *Journal of researches* has also come to be appreciated as one of the most fascinating of nineteenth-century travel books, and the most widely read of Darwin's works. It was first issued as the third volume of the *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* (London, Colburn, 1839). The manuscript was completed in June 1837 and the whole volume was in print by 1838, but had to wait for the other volumes to be completed before it could be issued. The second issue also appeared in 1839, the third volume of the set becoming a separate monograph. The preliminary pages i to vi were cancelled and replaced with a title page which read *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.* The sheets of the text were from the first issue. It has been generally thought that because public demand for Darwin's volume far exceeded the rest of the first issue set, the second issue was put on the market later in 1839. Freeman, however, claims that the second issue was published at the same time as the first.[2] A third issue, with new and conjugate title and half title leaves, dated 1840, but otherwise similar to the second issue was also published. The second edition, with the title altered to read *Journal of researches into the natural history and geology of the various countries ...* was published by John Murray in 1845. It has been claimed (specifically by

[2]Freeman, Richard, *The Works of Charles Darwin, an annotated bibliographical handlist* (London, Dawsons of Pall Mall, 1965), p. 14.

De Beer in his biography of Darwin)[3] that the change in position of the words 'geology' and 'natural history' points out the change in Darwin's primary interests as he studied the results of the Beagle expedition and thus can be seen as an integral part of his development of the theory of evolution. The second edition was issued as three parts of Murray's Colonial and Home Library series (nos. XXII–XXIV) and was extensively revised, the number of words being reduced from 224,000 to 213,000. The same year Murray reissued the book in one volume, as volume XII of the Colonial and Home Library series. In 1934 Nora Barlow edited for publication Darwin's manuscript diary, from which he prepared the *Journal of researches* and her examination of the three texts revealed how extensive the two revisions were. For instance; approximately one-third of the manuscript was omitted entirely from the published book, much was condensed and very little was printed verbatim. At the same time much of the scientific detail was added to both editions from the large notebooks which Darwin kept for the purpose of recording scientific data which he could accumulate only when afforded the opportunity of closely examining his collections of specimens. The manuscript diary is approximately 189,000 words in length and Lady Barlow printed a list of some of the significant passages which differ between the manuscript and the first and second editions on pages [441] and [443] of her *Charles Darwin's diary of the voyage of H.M.S. 'Beagle'*. The edition published by Murray in 1860 (10th thousand) constitutes the final text as Darwin left it, although the 'New edition' of 1890 incorporated into the text a note which had formerly appeared as a postscript. Freeman lists some seventy separate issues which were published in England between 1845 and 1961 most of which are represented in this collection. In the U.S.A. Harper and Brothers of New York published a two-volume edition in 1846. The Appleton editions, from Darwin's normal American publisher, began to appear in 1871. The first translation (into German) was issued in 1844 and the book also appeared in Danish, French, Italian, Russian and Swedish during Darwin's lifetime. The collection recently acquired Ernst Haeckel's own copy of the first German edition.

The Journal of researches is preceded by two minor works closely related to it. What is now known as the *Letters on geology*, generally considered Darwin's first published work, appeared in 1835. Freeman however points out that in 1829, while an undergraduate at Cambridge, he had sent notices of insects he had captured to James F. Stephens, who published some of them in his *Illustrations of British entomology* (1827–1845).[4] The *Letters on geology* is a small, grey pamphlet of 31 pages, without a title page, and was issued without Darwin's knowledge. Its introductory paragraph reads: 'The

[3]De Beer, Sir Gavin, *Charles Darwin, a scientific biography* (Garden City, Doubleday, 1965), pp. 56–57.

[4]Freeman, p. 10.

following pages contain Extracts from letters addressed to Professor Henslow by C. Darwin, Esq. They are printed for distribution among the members of the Cambridge Philosophical Society, in consequence of the interest which has been excited by some of the geological notices which they contain, and which were read at a meeting of the Society on the 16th of November 1835'. It was reprinted, with a preface by Dr. Sydney Smith, by the Cambridge Philosophical Society in 1960 to mark the one hundredth anniversary of the publication of *Origin of Species*.

Between February 1838 and October 1843 appeared the record of the zoological results of the Beagle voyage. The *Zoology of the voyage of H.M.S. Beagle* was edited by Darwin and consisted of five parts in nineteen numbers. Darwin contributed a geological introduction to Part I, a geographical introduction to Part II and notices of habits and ranges for Parts II and III. His contributions to Part III (Birds, by John Gould) were particularly extensive. Freeman gives a detailed bibliographical description of the set.[5]

Another minor Darwin publication from this period is a quarto size pamphlet with no title or imprint, called, from its caption title, *Questions about the breeding of animals*. Known only from the two copies held by the Zoological Library of the British Museum and the Darwin Archive of Cambridge University Library, the pamphlet consists of twenty-one numbered paragraphs on eight pages. The text is printed on the inner side of each page so that there is room for 'answers' on the outer side. It appears to have been sent to various animal breeders in order to gather specific data that they might have noticed while engaged in their normal work. Darwin later pointed to many parallels between the results of 'artificial selection' practised by farmers and 'natural selection'. Recent investigations have shown the date of issue to have been between January 1, 1839 and May 6, 1839.[6] A facsimile reprint, with an introduction by Sir Gavin de Beer, was issued in 1968 by the Society for the Bibliography of Natural History.

Geological observations on coral reefs, volcanic islands, and on South America, being the geology of the voyage of the Beagle ... (London, Smith, Elder, 1851), the geological results of the Beagle voyage, was originally issued in three parts over a period of five years (*The structure and distribution of coral reefs*, 1842; *Geological observations on the volcanic islands*, 1844; *Geological observations on South America*, 1846). That the three parts were intended to form one complete work is indicated by their title pages and the 1851 edition consists of the unsold sheets of the original parts with the title pages and half titles discarded and a new, general title page substituted. In

[5]Freeman, pp. 11–13.

[6]Freeman, Richard and Gautrey, P. J., *Darwin's Questions about the breeding of animals* ... (Journal of the Society for the Bibliography of Natural History, v. 5, no. 3, 1969), pp. 220–225.

1874 Smith, Elder reissued the *Coral reefs* volume by itself as the 'second edition, revised'. It had been almost completely rewritten by Darwin to take account of the work on coral reefs by James Dwight Dana and others, and to answer some of their criticisms. Darwin had proposed a theory of 'subsidence' to account for the structure of the coral reefs, particularly the great depth of water through which they rose from the ocean floor to the surface. Although questioned by geologists of his time this theory has proven substantially correct. The other two parts of the general work (*Volcanic islands* and *South America*) were republished in 1876 as a single volume. Although called a 'second edition', the text was unaltered, a few references in the preface being the only additions. There have been few reprints of these works, although the general importance of Darwin's geological work during the Beagle voyage has long been appreciated, especially his development of techniques of observation later focussed on subjects of natural history.

In 1849 Sir John F. W. Herschel edited *A Manual of scientific enquiry, prepared for the use of Her Majesty's Navy and adapted for travellers in general.* Darwin contributed the article on geology, which occupies pages 156 to 195. It consisted of suggestions for the aspiring geologist concerning what to look for and how to record and preserve what he noticed. In the same year, Darwin's article was reprinted as a repaginated pamphlet in which corrections necessitated by compositors' errors, recounted in detail by Freeman,[7] were made. The errors, however, exist only in some copies of the *Manual*, which thus has two 'states'. The repaginated pamphlet is titled *Geology*. The *Manual of scientific enquiry* went into a second edition in 1851, in which Darwin's contribution, in the form of the corrected text, occupies pages 166 to 204. Its third, fourth and fifth editions were published in 1859, 1871 and 1886, with no further corrections to Darwin's article. Two other repaginated pamphlets, each called *Manual of geology*, were exerpted from the third and fourth editions.
the third and fourth editions.

Darwin became interested in barnacles when he discovered on the coast of Chile a peculiar species of burrowing barnacle for which he had to create a special sub-order. After the *Geological observations on South America* was published in 1846 he planned to proceed with what he described as a 'little zoology' and chose the cirripedes. Eventually he had some ten thousand specimens from all over the world to study and his direct involvement with both the living and fossil forms of the sub-class lasted eight years. In 1852 he recorded in a letter that he had come to 'hate a barnacle as no man ever did before'.[8] The two volumes on the living cirripedes were published by the Ray Society in 1851 and 1854 (numbers 21 and 25 of the Society's publications) and although neither of the volumes gives any specific

[7]Freeman, pp. 18–19.

[8]Darwin, *The Life and letters*, v. 1, p. 385.

indication that it is part of the same work as the other, the volumes are collectively called *A monograph on the sub-class Cirripedia* ... A detailed bibliographical description of this work is given by Richard Curle in his *Bibliographical history of the Ray Society* (1951). In the same years (1851 and 1854) the Palaeontographical Society issued the results of Darwin's study of the fossil cirripedes of Great Britain. Volume one was titled *A monograph on the fossil Lepadiae* ... and volume two was called *A monograph on the fossil Balanidae and Verrucidae*. Again the title pages do not link the two works, but the preface to volume two states that it completes the work. These four volumes constitute Darwin's only contribution to formal taxonomy. Although some of his friends regretted what they considered his waste of time on minutiae, Darwin himself saw the work as a partial substitute for the formal scientific training in natural history which he lacked. These works are still regarded as basic reference sources for their field.

On June 18, 1858 Darwin's work on the 'large book', which was to include the results of his research up to that point, was interrupted by the famous communication from Alfred Russell Wallace. It contained a virtually perfect statement of Darwin's own theory of evolution by natural selection. Darwin submitted Wallace's paper to Lyell and Hooker and asked for their advice concerning how he should handle a potentially awkward situation. In surely one of the most notable cases of cooperation rather than competition in announcing scientific discoveries it was decided that Darwin should assemble an outline of his own theory and the two should be submitted jointly to the Linnean Society by Lyell and Hooker. Thus Darwin's first published announcement of the theory of evolution appeared, as part of the joint paper, in volume III, number 9, pages 45–62 of the *Journal of the proceedings of the Linnean Society of London, zoology*. Darwin's contribution consisted of two short pieces: *Extract from an unpublished work on species* ... and *Abstract of a letter ... to Prof. Asa Gray ... dated Down, September 5th, 1857*. An offprint of the whole communication was issued in 1858, of which very few copies have survived. It was first reprinted on pages [87] to 107 of a volume entitled *The Darwin–Wallace celebration held on Thursday, 1st July, 1908 by the Linnean Society of London* and has subsequently appeared in other publications.

On the origin of species by means of natural selection; or, The preservation of favoured races in the struggle for life was published November 24, 1859 by John Murray of London. Contemporary accounts gave rise to the oft-repeated statement that an eager public bought up the whole first issue of 1250 copies on the first day, although Freeman questions this assertion.[9] The bibliographical history of this book, up to the appearance of the thirty-ninth thousand in 1890, is given in detail by Morse Peckham in his 'variorum

[9]Freeman, p. 21.

edition' of 1959[10] and Freeman adds some further information.[11] The type from which the first edition was printed was not completely re-set until the sixth edition (1872). The printers considered each edition as a working revise and only re-set as much as was necessary to incorporate the revisions; thus the work, for the first thirteen years of its existence, was in a state of almost continual revision. The physical extent of the changes made between editions is well illustrated by the example of the fifth edition. Between the fourth edition (1866) and the fifth (1869) 178 sentences were dropped, 1770 sentences were rewritten and 227 sentences were added.[12] Changes were not confined only to the edition revisions. Darwin was able to make small changes, usually altering only single words and punctuation, between each issue or 'thousand'. The eleven separate issues, from the first to the eighteenth thousand, thus all contain textual alteration. One of the great strengths of Toronto's collection is that it contains all these separate printings, and, indeed, continues with almost all separate English editions and issues up to the present. The third edition (1861) contained a table of 'Additions and corrections to the second and third editions' and 'An historical sketch of the recent progress of opinion on the origin of species'. There appears in the sixth edition (1872) a 'Glossary of the principal scientific terms used in the present volume', compiled by W. S. Dallas. The sixth edition of 1872 was considered for many years to be the definitive text. Peckham points out, however, and Freeman emphasizes, that the 1876 printing, called the 'eighteenth thousand', has slight textual changes, which establish it as the final text as Darwin left it. The word 'evolution' does not appear in *Origin* until the sixth edition (1872). It has been translated into at least twenty-four languages, the first being that of H. G. Bronn into German (1860). This edition contains the first appearance of the 'Historical sketch' which did not appear in English until the third edition of 1861. It was then revised and much expanded. In Darwin's life-time this work was also translated into Danish, Dutch, French, Italian, Hungarian, Polish, Russian, Spanish and Swedish. This collection holds the first Russian (1864) and the first Greek (1915) editions, neither of which is recorded in the recently published United States *National Union Catalogue*. The first American edition of *Origin* was published by Appleton in New York in 1860. There are four Appleton printings of that year, the fourth of which contains some notes by Darwin which are not included in the second English edition of the same year.

Because Darwin considered *The Origin of Species* to be an 'abstract' of a projected work, he had, after its publication, an immense amount of material

[10]Darwin, Charles, *The Origin of species ... a variorum text*, ed. by Morse Peckham (Philadelphia, University of Pennsylvania Press, 1959), pp. 11–25.

[11]Freeman, pp. 20–25.

[12]Darwin, *The Origin of species ... a variorum text*, p. 22.

left over which he had not been able to include. This supporting evidence for his theory, to which he continued to add, began to be published in 1862, the first book being called *On the various contrivances by which British and foreign orchids are fertilized by insects, and on the good effects of intercrossing*. It was concerned with the relationships between the sexual structures of orchids and the insects that fertilize them and Darwin was able to demonstrate that natural selection had determined their evolution. The second edition, published in 1877, altered the title to read *The various contrivances by which orchids are fertilized by insects* and all subsequent reprints are from the stereo plates of this edition. The last to be published in England was the 1904 seventh impression. Translations were made into French (1870), German (1862), Italian (1883), and Russian (1900). Although recognized by botanists to be of considerable importance, this work was not a great commercial success, selling only about 6,000 copies by 1900.

On the movements and habits of climbing plants, the second book of specialized evidence of evolution by natural selection, was first published in volume IX of the *Journal of the Linnean Society of London* (1865). It occupies pages 1 to 118 of numbers 33 and 34 of the *Journal* and existed only in this form, and that of an offprint with its own title page, until 1875 when John Murray issued a second edition, extensively revised and enlarged. The third thousand of 1882 constitutes the final text, an appendix to the preface and an errata note having been added. It was reprinted by Murray up to 1937, the last Darwin book to be kept in print by this publisher. There were German, French, Italian and Russian editions, as well as the usual Appleton American edition. Darwin approached the subject from his usual 'evolutionary' point of view. Rather than just elucidate the physiological peculiarities of climbing plants he wished to demonstrate the common descent of plants with the properties of climbing.

In 1860 Darwin began to write his longest single work, *The Variation of animals and plants under domestication* and it was published in two volumes by Murray in 1868. There are two issues of the first edition, the first published on January 30 and the second in February, which contain many textual differences although their title pages are identical. Strangely, the Russian translation partly precedes the first English edition. Darwin sent corrected proofs to the translator, V. O. Kovalevskii, and he managed to issue the first four parts during 1867. The second edition of 1875 was again revised extensively and remained the standard text; subsequent reprints having been taken from the stereos of it. Orange, Judd and Co. published the first American edition in 1868 with a preface by Asa Gray. Chapter XXVII contained the first explication of Darwin's hypothesis of pangenesis, an attempt to bring into coherent focus many of the apparently diverse phenomena he had noticed regarding heredity, including acquired characters, the effects of use and disuse, variation, graft-hybrids, hybridization, reversion to ancestral type and atavism, regeneration, reproduction and embryonic development. His use of hypotheses, already attacked by critics of *Origin*, he justified by quoting William Whewell's statement that 'hypotheses may often be of service to science, when they involve a certain portion of incompleteness, and even of error'.[13] Darwin regarded this work as an installment of the evidence and a reference for the conclusions he had reached in *Origin*, which he had promised the readers of that book.

Although another volume of accumulated evidence was originally intended to follow *Variation of animals and plants* Darwin became so tired of the subject while waiting for it to be published that he turned, for relaxation, to the composition of *The Descent of man, and selection in relation to sex*. As early as 1837 he had recorded, in his *Notebooks on transmutation of species*, 'Man in his arrogance thinks himself a great work worthy the interposition of a deity. More humble and I believe truer to consider him created from animals'.[14] In *Origin* he had skirted the obvious logical extension of his theory into the human realm by merely mentioning that, through his theories, 'light will be thrown on the origin of man and his history'.[15] The first edition of *Descent of man* was published February 24, 1871 in two volumes by John Murray. Again there are two issues which appear to be exactly the same externally, but which contain important textual differences. The first American edition (New York, Appleton, 1871) is based on the first issue of the English edition, although it corrects some of the minor literal errors. Later in the same year two further issues, the seventh and eighth thousands, each containing small textual changes, were published. The second edition (tenth thousand) appeared in 1874 in one volume, extensively revised, and containing a note by T. H. Huxley on the brains of man and apes. The definitive text is the twelfth thousand of 1877, and reprints of it reached the thirty-fifth thousand by 1899. Danish, Dutch, French, German, Hungarian, Italian, Polish, Russian and Swedish translations are recorded up to 1892. Almost three quarters of this work is taken up with sexual selection, mentioned by Darwin in *Origin* as being another agency through which evolution could be explained. The development of special structures which relate to the mating of animals, such as the peacock's train and the deer's antlers, are explained by the hypotheses of sexual selection and Darwin also deals with sexual selection in man. The examples he cites, ranging through the whole

[13]Darwin, Charles, *The Variation of animals and plants under domestication* (London, Murray, 1868), v. 2, p. 357.

[14]Darwin, Charles, *Darwin's notebooks on the transmutation of species*, part II, ed. by Sir Gavin de Beer (London, Bulletin of the British Museum (Natural History), Historical series, v. 2, no. 3, 1960), p. 106.

[15]Darwin, *The Origin of species ... a variorum text*, p. 757.

animal kingdom from molluscs to man, account for the length of this work. The simple conclusion of the book, which did not arouse nearly as much public controversy as expected, was that 'man and all other vertebrate animals have been constructed on the same general model'. The probable reason for its general acceptance was that most of the energy of the religious opponents of the theory of evolution had been expended during their attacks on *Origin*.

In *The Expression of the emotions in man and animals* Darwin moved into an area which today would be considered essentially psychological. It is, however, intimately related to his evolutionary studies, its impetus being a rejection of the concept, maintained by Sir Charles Bell, that the facial muscles of expression in man were a special endowment. Darwin had for many years closely observed both his children and his pets and made notes on the different ways emotions were expressed by them. He was thus able to formulate three principles underlying the expression of emotions. First; certain movements and actions indicate a particular state of mind and will be reproduced when this state of mind is induced even though they are of no use. An example of this is a man snarling, although he no longer has large canine teeth with which to follow through the threat. The antithesis of this principle constitutes the second principle. When the state of mind is reversed the movements or actions will also be reversed. The third principle states that certain reflex actions depend on the structure of the nervous system. The first edition was published on November 26, 1872 by Murray in an edition of 7,000 copies, very large for a Darwin first. A second edition was not needed until 1890, when it was edited by Darwin's son Francis, incorporating notes accumulated by Darwin between 1872 and his death in 1882. The first American edition was published by Appleton in 1873 and the work was translated into the major European languages.

Darwin next turned again to the study of plants. He had previously noticed with surprise the large number of insects captured by the common sundew in Sussex and so began to experiment with these plants. He tested the plants' reactions to such diverse substances as raw meat and poison from a live adder. He discovered that the impulse which causes the tentacles to bend is transmitted through the cellular tissue of the leaf, and calculated that the plants were seventy-eight times more sensitive than the swing balances of his time, being able to distinguish a piece of human hair weighing 0.0008 milligrams. In 1875 he published the results of these experiments in *Insectivorous plants*, relating them to his evolutionary works through a study of the adaptations of the plants to impoverished conditions. The second and third thousands were also published in 1875, the second adding an errata slip and the third correcting these errata, but adding a slip with six more. Francis Darwin revised the book and published the second edition in 1888, which also included some small corrections by Darwin himself. Appleton, as usual, published the American edition in 1875, and French, German, Italian and Russian translations appeared in Darwin's lifetime.

The Effects of cross and self fertilisation in the vegetable kingdom continued Darwin's studies in the field of botany. He conducted experiments on fifty-seven species of plants over a period of twelve years and concluded that cross pollination produces more numerous, larger, more vigorous plants than self pollination. His results were published in 1876. Although 1500 copies were sold before the end of the year the work was too specialized and technical to attract a wide audience. The second edition appeared in 1878 with a few revisions and was reprinted four times. The 1915 reprint is also called a 'second edition' although it is really only a reproduction from the stereos of the 1878 second edition. The usual American and foreign editions appeared before 1892.

A number of Darwin's observations and experiments on flowers of different style lengths were published in the *Journal of the Linnean Society of London* and other periodicals. In 1877 he brought together, with extensions and revisions, the whole series and published it as *The Different forms of flowers on plants of the same species.* As a work with wide appeal it suffered from the same defects of complexity and technicality as *The Effects of cross and self fertilisation.* A second edition, to which Darwin added a new preface listing recent studies on the same subject, was published in 1880 and Francis Darwin added another 'survey of recent literature' to the third thousand of 1884. A New York, Appleton edition was published in 1877 and French and German editions in 1878 and 1877, respectively.

The Power of movement in plants, published in 1880, was the result of five years experiments carried out by Darwin with the assistance of his son Francis. It was an extension of his work on climbing plants and attempted to show that the mechanisms used by the twining plants were the same as those for flowering plants in general. This book seems to have been the least popular of Darwin's works, the third thousand of 1882 being the last English edition recorded by Freeman, although Appleton continued to issue it in the United States up to 1900.

For his last major work Darwin chose a subject which had interested him since the time of the Beagle voyage, and in 1881 Murray published *The Formation of vegetable mould, through the action of worms, with observations on their habits.* The 'worm stone' at Down House is now a well known tourist attraction and it is recognized that Darwin's study of the part played by worms in the aeration of soil and the formation of mould essential to plant life constitutes a pioneer work in ecology. There were six separate printings of the book in 1881 and it achieved its thirteenth thousand in 1904. The changes made between thousands, although small, are of some textual significance, the corrections after the seventh thousand of 1833 having been made by Francis Darwin.

Between publication of his major works, Darwin wrote and published several less significant pieces. In 1862 Leonard Jenyns, who later changed his last name to Blomefield, published a *Memoir of the Rev. John Stevens Henslow.* Darwin had been known at Cambridge as 'the man who walked with Henslow' and his first publication, the *Letters on geology,* had been an extract of letters to Henslow. He contributed his recollections of Henslow on pages 51–55 of Jenyns' book.

In connection with his work on *The Expression of the emotions* Darwin composed and circulated a single sheet called *Queries about expression* in 1867. He referred to it and reprinted a version of it on pages 15–16 of *The Expression of the emotions in man and animals,* but the original sheet is known only from two copies in the Darwin Archive, Cambridge University Library. Another version of the questionnaire was printed in the *Annual report of the Smithsonian Institution* for 1867 (p. 324).

In 1879 Ernst Krause published a short biography of Erasmus Darwin in *Kosmos.* The same year W. S. Dallas translated it and Murray published it as a separate work with a 'preliminary notice' by Darwin, which turned out to be longer than Krause's original work. A second edition of 1887, edited by Francis Darwin, credited Darwin with more of the work and added a footnote stating that the original German text had been slightly altered. The omission of this footnote from the first English edition provided Samuel Butler with the impetus for one of his most bitter and sustained attacks on Darwin.

A pamphlet compiled by George R. Jesse called *Correspondence with Charles Darwin ... on experimenting upon living animals* was published in 1881. The first letter, of considerable length, was from Darwin to Frithiof Holmgren. It had previously been published in *The Times.*

George J. Romanes published in 1882 a work called *Animal intelligence* which contained long quotations from *Origin* and *Descent of man.* It also had a number of extracts from Darwin's notes on behaviour, which were here published for the first time. The book was in the press at the time of Darwin's death. Nine editions, which are really reprints, were published up to 1910. Romane's *Mental evolution in animals,* published in 1883, contained, as an appendix, what was called a 'posthumous essay on instinct' by Darwin. It was really a part of Darwin's 'large work' on origin of species, of which *Origin* was an abstract.

What are now known as the *Sketches of 1842 and 1844* were edited by Francis Darwin in 1909 as part of the centenary celebrations at Cambridge of Darwin's birth. The two works gave the earliest expression of Darwin's evolutionary ideas. They have been reprinted in *Evolution by natural selec-*

tion (Cambridge University Press, 1958).

A short work on the flight paths and "buzzing places" of male humble bees, which was accompanied by a drawing of the grounds of Down House, was published by Ernst Krause in 1885–86 as part of a two volume work called *Gesammelte kleinere Schriften.* The title of the paper was 'Uber die Wege der Hummel–Männchen'. The first English translation of this work, from the German, appeared as an Appendix to Richard Freeman's *The Works of Charles Darwin, an annotated bibliographical handlist.* Darwin's original English manuscript appears to have been lost.

After Darwin's death in 1882 his son Francis edited a three volume biographical work called *The life and letters of Charles Darwin, including an autobiographical chapter.* It was first published by Murray in 1887 and reached its seventh thousand in 1888. The second edition of 1887 was revised slightly and an abridged edition in one volume, called *Charles Darwin: his life told in an autobiographical chapter* ... was published in 1892. Francis Darwin and A. C. Seward produced in 1903 *More letters of Charles Darwin* and Henrietta E. Litchfield edited in 1904 a privately printed work called *Emma Darwin, wife of Charles Darwin; a century of family letters.* It was actually first 'published' by Murray in 1915. All these works contain a great deal of information both about Darwin's personal life and his work. They assume an especial importance in any discussion of the question of Darwin's very poor health over the largest part of his working career and the effect of his health on his work.

Charles Darwin's diary of the voyage of H.M.S. Beagle was edited for publication in 1933 by Nora Barlow, Darwin's granddaughter. She also edited *Charles Darwin and the voyage of the Beagle* (1945) and *The Autobiography of Charles Darwin* (1958). The latter work includes some passages omitted from the original publication of the 'autobiography' in the *Life and Letters.*

Darwin's 'notebooks' and 'journal' which survived in manuscript, have been published in recent years. They supplement and illuminate many of the principal books and provide records of observations and experiments not used during Darwin's life. The 'journal' appeared in the *Bulletin of the British Museum (Natural History), Historical series* (v. 2, p. 1–21) in 1959. In 1960–61 and 1963 the 'notebooks on transmutation of species', edited by Sir Gavin de Beer and the 'ornithological notes', edited by Nora Barlow appeared in the same publication.

The theory of evolution by natural selection did not suddenly emerge into a scientific vacuum. Men before Darwin had speculated about the transmutation of species, and many of his scientific contemporaries were working on problems directly related to his own studies. After *Origin* was published, a fierce controversy over his theory raged throughout both scientific and lay circles. This collection has attempted to bring together editions of the most important works of Darwin's immediate predecessors. The works of his supporters and opponents which deal with aspects of his theories, and the books about Darwin, written in recent years, which discuss both his life and his scientific work have also been sought. The collection does not include works only concerned with the religious controversies surrounding Darwin's books. The religious aspect is present, however, in much of the contemporary criticism which also has scientific importance.

The general collection of scientific books in the Rare Books Department contains some of the principal books by Darwin's predecessors, including Cuvier and Buffon. Lamarck, whose theory of 'transformism' was an attempt to account for evolution, is also represented. Erasmus Darwin, the grandfather of Charles Darwin, speculated in his *Zoönomia* (1794–6) about modification and the mutability of species. He recognized the importance of adaptations, but could not explain how they were produced. Charles Darwin admitted having read *Zoönomia*, but disclaimed its having had any significant influence on the development of his theories. *An Essay on the principle of population* by Thomas Malthus played a curious role in the development of the theory of evolution by natural selection. Both Darwin and Wallace arrived at a synthesis of their previously fragmented ideas about natural selection through the reading of Malthus. The general collection of the Rare Books Department contains the first edition of 1798.

The Darwin Collection also contains works by Darwin's immediate predecessors, in particular, the books of three curious, very dissimilar gentlemen. William Paley's *Natural theology*, intended to refute the ungodly tendencies of eighteenth century French philosophy and combat the influence of Hume, became a standard textbook at English universities, where Darwin read it. He recorded that 'I did not at that time trouble myself about Paley's premises; and taking these on trust I was charmed and convinced by the long line of argumentation'.[16] This collection contains the editions of 1818 and 1826. In 1844, the same year Darwin was writing the second 'sketch' of his theory, a book called *Vestiges of the natural history of creation* was anonymously published. It contained a crudely thought out but eloquently expressed theory of evolution and finally became so controversial that the author, Robert Chambers, was purportedly refused the office of Lord Provost of Edinburgh because of the suspicion that he had written it. The book also became very popular and possibly helped the reception of *Origin*, through having become the subject of wide general discussion. The collection contains copies of the second, fourth, sixth, eighth, tenth, eleventh and twelfth editions. Opposite to Chambers, and arguing just as fervently against evolution as Chambers argued for it, was another self-taught Scot, Hugh Miller. In such books as

[16]Darwin, *The Autobiography*, p. 59.

The Old red sandstone (1841), *The Two records, Mosaic and geological* (1854) and *The Testimony of the rocks* (1857) Miller attempted to reconcile Old Testament theology with his geological observations. Miller's books were also very popular and widely read by the general public.

The most important single influence on the development of Charles Darwin's evolutionary ideas was the work of Sir Charles Lyell, who also eventually became one of the most significant supporters of *Origin*. When Darwin embarked on the Beagle voyage in 1831 he took with him the first volume of Lyell's newly published *Principles of geology*, recommended to him by Henslow, with the reservation that he must not believe what it contained. Towards the end of 1832 Darwin received the second volume, in which Lyell described, and rejected, Lamarck's theory of transmutation. The third volume of *Principles of geology* was published in 1833. Lyell, however, was very cautious about publicly committing himself fully to the new theory, and it was not until the tenth edition of the *Principles of geology* appeared in 1867–68 that Lyell finally announced his full conversion to the mutability theory. This collection contains copies of the first, second (1833), eighth (1850) and tenth editions of the *Principles of geology*. Lyell's other important work, the *Geological evidences of the antiquity of man* is represented in its first (1863) and fourth (1873) editions. *The Life, letters and journals of Sir Charles Lyell*, edited by his sister-in-law and published in 1881, contains many references to Darwin and some of Lyell's letters to him. Darwin recorded in his *Autobiography* that 'the science of geology is enormously indebted to Lyell – more so, as I believe, than to any other man who ever lived'.[17]

Thomas Henry Huxley, 'Darwin's bulldog', played a key role in bringing about the general acceptance of Darwin's theories. He was willing, and able, to engage in debate any of the numerous opponents of evolution. His reply to Bishop Wilberforce at the June, 1860 meeting of the British Association for the Advancement of Science is remembered as one of the classic anecdotes of scientific controversy. Huxley's *Evidence as to man's place in nature*, published in 1863, went clearly and succinctly to the heart of the problem of the theory of evolution by natural selection, its relation to man. Using embryology, paleontology and comparative anatomy Huxley established the anthropoid origin of man and thus expressed with scientific authority what many had thought, but none had dared to publish. The *Collected essays* of Huxley, published in nine volumes from 1898 to 1901, bring together the writings for which he was best known publicly. His 'working men's lectures', on such subjects as 'a piece of chalk' had exposed, for the first time, large masses of people to the results of current scientific experimentation and observation in natural history. Huxley's other purely scientific books, such as *An Introduc-*

[17]Darwin, *The Autobiography*, p. 101.

tion to the classification of animals (1869) and *A Manual of anatomy of invertebrated animals* (1877) were written in the midst of heavy lecture schedules, service on innumerable government commissions, and the filling of executive positions in many scientific societies. The *Life and letters of Thomas Henry Huxley* (1900) edited by his son Leonard, contains many of Huxley's letters to Darwin and thus provides one side of a remarkable relationship. Huxley's obituary notice of Darwin appeared in *Nature*, April 1882 and was reprinted in volume three of the *Collected essays*. The collection also possesses a copy of Huxley's testimonials, compiled for his application for the Chair of Natural History at the University of Toronto in 1851, including one from Darwin. He was turned down for the position in favour of William Hincks.

On January 11, 1844 Darwin wrote to his close friend and confidant Joseph Dalton Hooker 'At last gleams of light have come and I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable'.[18] Hooker, the greatest botanist of his time, used Darwin's theories of transmutation and natural selection in his *Tasmanian flora* (1859) and it was to him, along with Lyell, that Darwin submitted the paper of A. R. Wallace in 1858. Hooker's *Life and letters*, edited by Leonard Huxley and published in 1918, contains many references to Darwin and his work.

The works of Alfred Russel Wallace, after the time of his famous paper of 1858, are very different from those of Darwin. He did, however, make valuable contributions to the understanding of the theory of evolution by natural selection. His *Contributions to the theory of natural selection* (1870) and *Darwinism* (1889) were both directly related to Darwin's work. The basic point of difference between the two scientists arose over the question of the application of Darwin's theories to man. While Darwin was willing to go, logically, the whole way, Wallace insisted on a special position for man and retreated into a kind of mysticism. Such books as *Miracles and modern spiritualism* (1896) and *Man's place in the universe* (1903) demonstrated the principal concerns of his later years. His autobiography, *My life* was published in 1905.

Of the other prominent Darwin supporters the collection contains books by Leonard Jenyns (*Memoir of ... Henslow, 1862*), Sir John Lubbock (*Fifty years of science*, 2d ed., 1882), and Robert E. Grant (*Outlines of comparative anatomy*, 1841 and *Tabular view of the ... animal kingdom*, 1861).

The initial opposition to the theories expressed in *Origin* was, on the whole, of little scientific significance. Sir Richard Owen attacked *Origin* in the Edinburgh Review for April 1860 and coached Bishop Wilberforce for the famous Oxford meeting, but his comments displayed more spleen than

[18]Darwin, *The Life and letters*, v. 2, pp. 2–3.

mastery of scientific evidence. A more serious attack was mounted by H. St. George Mivart in 1871 in a book called *On the genesis of species*. He attempted to show that natural selection could not account for initial stages of adaptations and was answered by Darwin in the sixth edition of *Origin* (1872). Mivart also published *Lessons from nature* (1876), *Essays and criticisms* (1892) and *An Introduction to the elements of science* (1894). C. R. Bree's *An Exposition of fallacies in the hypothesis of Mr. Darwin* was published in 1872.

Samuel Butler, of *Erewhon* fame, provided a curious case of anti-Darwinian fanatacism. His *Evolution, old and new* (1879), which incorrectly accused Darwin of claiming originality for the concept of evolution, was published just before the English edition of Ernst Krause's *Erasmus Darwin*. When Butler found that an adverse comment about his book was contained in the English edition, but not in the original German he complained that he had been unjustly dealt with. Darwin's eventual explanation was not sent to Butler because his friends and family advised him to ignore the whole situation. Butler continued to attack both Darwin and his ideas throughout his life. The *Note-books* (1915), *Luck, or cunning, as the main means of organic modification* (1887) and several other non-fiction books by Butler have considerable Darwiniana interest.

In the United States Louis Agassiz, whose *Essay on classification* (1859) had espoused the concept of divine creation for each separate species, debated with Asa Gray over the basic issue of evolution before *Origin* was even published. Gray, of course, knew Darwin's views, Darwin's letter of 1857 to him having been part of the joint paper read to the Linnean Society in 1858. Gray published *A Free examination of Darwin's treatise on the origin of species* in 1861 and *Darwiniana* in 1876. John Fiske's *Darwinism, and other essays* first appeared in 1879 and by that time Darwin's theories seem to have been widely accepted among the scientific community of the United States.

In continental Europe the reaction to the publication of Darwin's theories varied considerably, but in Germany Darwinism was well received. This was due principally to the work of two men, Ernst Haeckel and Fritz Müller. Müller's *Für Darwin* (1864) lent influential support to the cause and was translated into English and published at Darwin's expense in 1869. Haeckel became a very enthusiastic evolutionist and his works, generally represented in this collection in their English versions, often went farther in a speculative way than Darwin himself was willing to go. The collection contains, among others, *The Evolution of man* (1883), The *History of creation* (6th ed.), *The Pedigree of man* (1883), *The Riddle of universe* (1900) and *Last words on evolution* (1906). August Weismann also wrote extensively about evolution and the collection contains his *Studies in the theory of descent* (1882), *Essays upon heredity ...* (1889), *The Evolution theory* (1904) and *Charles Darwin* (1909).

Herbert Spencer, who had expressed a belief in the mutability of species before *Origin* was published, supported, in his own peculiar way, the forces of the evolutionists. From his many books those which relate to Darwin and evolution are present in the collection. Included, among others, are *First principles* (1862), *Essays* (1863), *The Principles of biology* (1864–7), *The Factors of organic evolution* (1887) and *Facts and comments* (1902). His phrase, 'survival of the fittest' was first used by Darwin in the fifth edition of *Origin*, apparently due to the urging of Wallace, as Darwin felt uncomfortable with Spencer and his work. In the *Autobiography* Darwin says of Spencer; 'his deductive manner of treating every subject is wholly opposed to my frame of mind. His conclusions never convince me: and over and over again I have said to myself, after reading one of his discussions, – Here would be a fine subject for half-a-dozen years' work'.[19]

Many of Darwin's contemporaries and eminent scientists shortly after his death wrote books which deal with some aspect of evolution. Thus the collection has a considerable representation of works by such men as John Tyndall, Sir Francis Galton, Hugo de Vries and George A. Romanes.

This short survey of Darwiniana is meant only to indicate something of the scope of the collection. Also included are many of the later critical works of evolution, biographical works on Darwin and some of the ephemeral pamphlets, parodies and cartoons about Darwin and evolution.

Charles Darwin undoubtedly ranks with Newton and Galileo as a scientific innovator. His works had a profound effect on a whole society and have provided the basis for much of the work done in biology since his time. Darwin's own, typically unassuming, assessment of his life and work is given in the *Autobiography*. 'Therefore, my success as a man of science, whatever this may have amounted to, has been determined, as far as I can judge, by complex and diversified mental qualities and conditions. Of these the most important have been – the love of science – unbounded patience in long reflecting over any subject – industry in observing and collecting facts – and a fair share of invention as well as common sense. With such moderate abilities as I possess, it is truly surprising that thus I should have influenced to a considerable extent the beliefs of scientific men on some important points'.[20] This collection, one of the finest of its kind in the world, provides the resources for the intensive study of Darwin, his influence and the theory of evolution by natural selection.

[19]Darwin, *The Autobiography*, p. 109.
[20]Darwin, *The Autobiography*, pp. 144–145.

DEDICATED BY PERMISSION TO THE RIGHT HONOURABLE
THE COMMON SENSE OF THE PEOPLE OF ENGLAND.

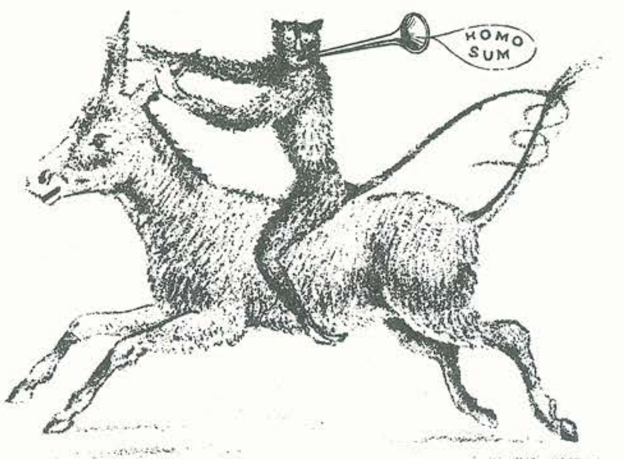
THE

Demands of Darwinism

ON

Credulity.

"*Nihil tam absurdum quod non quidam Philosophi dixerint.*"—CICERO.



"——MAN IS DESCENDED FROM A HAIRY QUADRUPED, FURNISHED WITH A TAIL AND POINTED EARS."—*Darwin.*

"DIFFERENTIATED INTO MAN."—*Tyndall.*

"O SAPIENTIA !"—*Prayer Book Calendar.*

BY

THE REV. F. O. MORRIS, B.A.,
AUTHOR OF A HISTORY OF BRITISH BIRDS,
DEDICATED BY PERMISSION TO HER MOST GRACIOUS MAJESTY THE QUEEN, ETC., ETC., ETC.

LONDON: PARTRIDGE AND CO., PATERNOSTER ROW.
AND TO BE HAD FROM ALL THE RAILWAY BOOKSTALLS.