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the privilege of being present at the interview between Goethe and Napoklon, and interposed tactful references to the works of the great poet. Daru fulfilled his usual duties in the campaign of 1809 against Austria. Afterwards, when the subject of the divorce of Josephine and the choice of a Russian or of an Austrian princess came to be discussed, Daru, on being consulted by Napoleon, is said boldly to have counselled his marriage with a French lady—and Napoleon, who admired his frankness and honesty, took the reply in good part.

In 1811 he became secretary of state in succession to Maret, duc de Bassano, and showed his usual ability in the administration of the vast and complex affairs of the French empire, including the arrangements connected with the civil list and the imperial domains. But neither his devotion to civic duty nor to the administration of the affairs of the Grand Army could ward off disaster. Late in the year 1813 he took up the portfolio of military affairs. After the first abdication of Napoleon in 1814, Daru retired into private life, but aided Napoleon during the Hundred Days. After the second Restoration he became a member of the Chamber of Peers, in which he ably defended the cause of popular liberty against the attacks of the ultra royalists. He died at Meulan on the 5th of September 1829.

Few men of the Napoleonic empire have been more generally admired and respected than Daru. On one occasion when he expressed a fear that he lacked all the gifts of a courtier, Napoleon replied, "Courtiers! They are common enough about me, I shall never be in want of them. What I want is an enlightened, firm and vigilant administrator, and that is why I have chosen you." At another time Napoleon said, Daru is good on all sides—he has good judgment, a good intellect, a great power for work, and a body and mind of iron! The only occasion on which he is known to have sunk beneath the weight of his duties was in the course of writing letters at the emperor's dictation for the third night in succession.

Of Daru's literary works may be mentioned his *Histoire de Venise*, published at Paris in 7 vols in 1819, the *Histoire de Bretagne*, in 3 vols (Paris, 1826), a poetical translation of Horace (of which Le Brun remarked "Je ne lis point Daru, j'en trop mon Horace"), *Discours en vers sur les facultés de l'homme* (Paris, 1825), and *Astronomie*, a didactic poem in six cantos (Paris, 1820).

See the Notice by Viennet prefixed to the fourth edition of Daru's *Histoire de la République de Venise* (9 vols 1853) and three articles by Sainte Beuve in *Causeries du lundi*, vol. ix. For the many letters of Napoleon to Daru see the *Correspondance de Napoléon I^{er}* (32 vols Paris 1858 1870) (J. H. L. R.)

DARWEN, a municipal borough in the Darwen parliamentary division of Lancashire, England, 20 m. N.W. from Manchester by the Lancashire & Yorkshire railway. Pop. (1891) 34,192, (1907) 38,212. It lies on the river Darwen, which traverses a densely populated manufacturing district, and is surrounded by high lying moors. Darwen is a centre of the cotton trade and has also blast furnaces, and paper making, paper staining and fire clay works. In the neighbourhood are collieries and stone quarries. The market hall is the chief public building; there are technical schools, a free library, and two public parks. Darwen was incorporated in 1788. The corporation consists of a mayor, six aldermen and eighteen councillors.

DARWIN, CHARLES ROBERT (1809–1882), English naturalist, author of the *Origin of Species*, was born at Shrewsbury on the 12th of February 1809. He was the younger of the two sons and the fourth child of Dr Robert Waring Darwin, son of Dr Erasmus Darwin (qv). His mother, a daughter of Josiah Wedgwood (1730–1795), died when Charles Darwin was eight years old. Charles Darwin's elder brother, Erasmus Alvey (1804–1881), was interested in literature and art rather than science. On the subject of the wide difference between the brothers Charles wrote that he was "inclined to agree with Francis Galton in believing that education and environment produce only a small effect on the mind of anyone, and that most of our qualities are innate" (*Life and Letters*, London, 1887, p. 22). Darwin considered that his own success was chiefly due to "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 of common sense" (*l.c.* p. 107). He also says "I have steadily endeavoured to keep my mind free so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as facts are shown to be opposed to it" (*l.c.* p. 103). The essential causes of his success are to be found in this latter sentence, the creative genius ever inspired by existing knowledge to build hypotheses by whose aid further knowledge could be won, the calm unbiassed mind, the transparent honesty and love of truth which enabled him to abandon or to modify his own creations when they ceased to be supported by observation. The even balance between these powers was as important as their remarkable development. The great naturalist appeared in the ripeness of time, when the world was ready for his splendid generalizations. Indeed naturalists were already everywhere considering and discussing the problem of evolution, although Alfred Russel Wallace was the only one who, independently of Darwin, saw his way clearly to the solution. It is true that hypotheses essentially the same as natural selection were suggested much earlier by W. C. Wells (*Phil. Trans.*, 1813), and Patrick Matthew (*Naval Timber and Arboriculture*, 1831) but their views were lost sight of and produced no effect upon the great body of naturalists. In the preparation for Darwin's Charles Lyell's *Principles of Geology* played an important part, accustoming men's minds to the vast changes brought about by natural processes, and leading them, by its lucid and temperate discussion of Lamarck's and other views, to reflect upon evolution.

Darwin's early education was conducted at Shrewsbury, first for a year at a day school, then for seven years at Shrewsbury School under Dr Samuel Butler (1774–1839). He gained but little from the narrow system which was then universal. In 1825 he went to Edinburgh to prepare for the medical profession, for which he was unfitted by nature. After two sessions his father realized this and in 1828 sent him to Cambridge with the idea that he should become a clergyman. He matriculated at Christ's College, and took his degree in 1831, tenth in the list of those who do not seek honours. Up to this time he had been keenly interested in sport, and in entomology, especially the collecting of beetles. Both at Edinburgh, where in 1826 he read his first scientific paper, and at Cambridge he gained the friendship of much older scientific men—Robert Edmond Grant and William Macgillivray at the former, John Stevens Henslow and Adam Sedgwick at the latter. He had two terms' residence to keep after passing his last examination and studied geology with Sedgwick. Returning from their geological excursion together in North Wales (August 1831), he found a letter from Henslow urging him to apply for the position of naturalist on the "Beagle," about to start on a surveying expedition. His father at first disliked the idea, but his uncle, the second Josiah Wedgwood, pleaded with success, and Darwin started on the 27th of December 1831, the voyage lasting until the 2nd of October 1836. It is practically certain that he never left Great Britain after this latter date. After visiting the Cape de Verde and other islands of the Atlantic, the expedition surveyed on the South American coasts and adjacent islands (including the Galapagos), afterwards visiting Tahiti, New Zealand, Australia, Tasmania, Keeling Island, Maldives, Mauritius, St Helena, Ascension, and Brazil, de Verdes and Azores on the way home. His work on the geology of the countries visited, and that on coral islands, became the subject of volumes which he published after his return, as well as his *Journal of a Naturalist*, and his other contributions to the official narrative. The voyage must be regarded as the real preparation for his life-work. His observations on the relation between animals in islands and those of the nearest continental areas, near akin and yet not the same, and between living animals and those most recently extinct and found fossil in the same country, here again related but not the same, led him even then to reflect deeply upon the modification of species. He had also been much impressed by "the manner in which closely allied animals replace one another in proceeding southwards" in South America. On his return home Darwin worked at his

collections, first at Cambridge for three months and then in London. His pocket-book for 1837 contains the words "In July opened first note-book on Transmutation of Species. Had been greatly struck from about the month of previous March [while still on the voyage and just over twenty-eight years old] on character of South American fossils, and species on Galapagos Archipelago. These facts (especially latter) origin of all my views." From 1838 to 1841 he was secretary of the Geological Society, and saw a great deal of Sir Charles Lyell, to whom he dedicated the second edition of his *Journal*. On the 29th of January 1839 he married his cousin, Emma Wedgwood, the daughter of Josiah Wedgwood of Maer. They lived in London until September 1842, when they moved to Down, which was Darwin's home for the rest of his life. His health broke down many times in London, and remained precarious during the whole of his life. The immense amount of work which he got through was only made possible by the loving care of his wife. For eight years (1846 to 1854) he was chiefly engaged upon four monographs on the recent and fossil Cirripede Crustacea (*Ray Soc.*, 1851 and 1854, *Palaeontograph Soc.*, 1851 and 1854). Towards the close of this work Darwin became very wearied of it, especially of the synonymy. For a time he hoped to start a movement which should discourage the habit of appending the name of the describer to the name of the species, a custom which he thought led to bad and superficial work. From this time he was engaged upon the numerous lines of inquiry which led to the great work of his life, the *Origin of Species*, published in November 1859.

Soon after opening his note book in July 1837 he began to collect facts bearing upon the formation of the breeds of domestic animals and plants, and quickly saw "that selection was the keystone of man's success. But how selection could be applied to organisms living in a state of nature remained for some time a mystery to me." Various ideas as to the causes of evolution occurred to him, only to be successively abandoned. He had the idea of "laws of change" which affected species and finally led to their extinction, to some extent analogous to the causes which bring about the development, maturity and finally death of an individual. He also had the conception that species must give rise to other species or else die out, just as an individual dies unrepresented if it bears no offspring. These and other ideas, of which traces exist in his Diary, arose in his mind, together with perhaps some general conception of natural selection, during the fifteen months after the opening of his note book. In October 1838 he read Malthus on *Population*, and his observations having long since convinced him of the struggle for existence, it at once struck him "that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species. Here, then, I had a theory by which to work." In June 1842 he wrote out a sketch, which two years later he expanded to an essay occupying 231 pages folio. The idea of progressive divergence as an advantage in itself, because the competition is most severe between organisms most closely related, did not occur to him until long after he had come to Down. During the growth of the *Origin* Sir Joseph Hooker was his most intimate friend, and on the 11th of January 1844 he wrote, "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" (*ibid.* p. 13). In 1855 he began a correspondence with the great American botanist Asa Gray, and in 1857 explained his views in a letter which afterwards became classical. In 1856, urged by Lyell, he began the preparation of a third and far more expanded treatise, and had completed about half of it when, on the 18th of June 1858, he received a manuscript essay from A. R. Wallace, who was then at Ternate in the Moluccas. Wallace wanted Darwin's opinion on the essay, which he asked should be forwarded to Lyell. Darwin was much startled to find in the essay a complete abstract of his own theory of natural selection. He forwarded it the same day, writing to Lyell, "your words have come true with a vengeance—that I should be forestalled." He placed himself in the hands of Lyell and Hooker, who decided to

send Wallace's essay to the Linnean Society, together with an abstract of Darwin's work, which they asked him to prepare, the joint essay being accompanied by a preface in the form of an explanatory letter written by them to the secretary. The title of the joint communication was "On the Tendency of Species to form Varieties, and on the Perpetuation of Varieties and Species by Natural Means of Selection." It was read on the 1st of July 1858, and appears in the *Linnean Soc. Journal* (Zoology) for that year. In this statement of the theory of natural selection, Darwin's part consisted of two sections, the first being extracts from his 1844 essay, including a brief account of sexual selection, and the second an abstract of his letter to Asa Gray dated the 5th of September 1857. This latter, probably his first attempt to expound natural selection, cannot be surpassed as a clear statement of the theory. Darwin explained at the outset, what he insisted on elsewhere, that the facts of adaptation or contrivance in nature are the real difficulty to be explained by a theory of evolution, the stumbling block of every previous suggestion. Until he could explain "the mistletoe, with its pollen carried by insects, and seed by birds—the woodpecker, with its feet and tail, beak and tongue, to climb the tree and secure insects," he was "scientifically orthodox." Nevertheless he was led to believe in evolution, apart from any possible motive cause, by "general facts in the affinities, embryology, rudimentary organs, geological history, and geographical distribution of organic beings." He then proceeds to describe the manner in which he met the difficulty of adaptation by "his notions on the means by which Nature makes her species." The essentials of the statement are as follows—I Man has made his domestic breeds of animals and plants by selection, conscious or unconscious, of very slight or greater variations. II The material for selection exists in nature, namely, slight variations of all parts of the organism. III The "unerring power" which sifts these variations is "natural selection," which selects exclusively for the good of each organic being. The rate of increase is such that only a few in each generation can live; hence the never sufficiently appreciated struggle for life. "What a trifling difference must often determine which shall survive and which perish!" The remaining heads explain the complex nature of the struggle, the reasons for deficient direct evidence, the advantage of divergence, &c. In the joint essay the phrases "natural selection" and "sexual selection" were first made public by Darwin, the "struggle for existence" by Wallace. Darwin and Wallace had met only once before the departure of the latter for the East. Their rivalry in the discovery of the great principle of natural selection was the beginning of a lifelong friendship. Wallace was lying ill with intermittent fever at Fernate in February 1858 when he began to think of Malthus's *Essay on Population*, read several years before. Suddenly the idea of the survival of the fittest flashed upon him. In two hours he had "thought out almost the whole of the theory," and in three evenings had finished his essay. Darwin, also inspired after reading Malthus, in October 1838, did not publish until nearly twenty years had elapsed, and then only when Wallace sent him his essay. Canon H. B. Tristram was the first to apply the new theory, explaining by its aid the colours of desert birds, &c. (*Ibid.*, October 1859).

Acting under the advice of Lyell and Hooker, Darwin then began to prepare what was to become the great work of his life. It appeared on the 24th of November 1859, with the full title, *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. The whole edition of 1250 copies was exhausted on the day of issue. The first four chapters explain the operation of artificial selection by man and of natural selection in consequence of the struggle for existence. The fifth chapter deals with the laws of variation and causes of modification other than natural selection. The five succeeding chapters consider difficulties in the way of a belief in evolution generally as well as in natural selection. The three remaining chapters (omitting the recapitulation which occupies the last) deal with the evidence for evolution. The theory which suggested a cause of evolution is thus given the foremost place,

and the evidence for the existence of evolution considered last of all. This method of presentation was no doubt adopted because it was just the want of a reasonable motive-cause which more than anything else prevented the acceptance of evolution. But the other side of the book must not be eclipsed by the brilliant theory of Darwin and Wallace. The evidence for evolution itself had never before been thought out and marshalled in a manner which bears any comparison with that of Darwin in the *Origin*, and the work would have been in the highest degree epoch-making had it consisted of the later chapters alone. In the fifth chapter Darwin incorporated a certain proportion of the doctrines of Buffon,—modifications due to the direct influence of environment; and of Lamarck,—the hereditary effects of use and disuse. Lyell for a long time hesitated to accept the new teaching, and Darwin carried on a long correspondence with him. His public confession of faith was made at the anniversary dinner of the Royal Society in 1864. A storm of controversy arose over the book, reaching its height at the meeting of the British Association at Oxford in 1860, when the celebrated duel between T. H. Huxley and Bishop Wilberforce of Oxford took place. Throughout these struggles Huxley was the foremost champion for evolution and for fair play to natural selection, although he never entirely accepted the latter theory, holding that until man by his selection had made his domestic breed sterile *inter se*, there was no sufficient evidence that selection accounts for natural species which are thus separated by the barrier of sterility. The theory of natural selection was at first greatly misunderstood. Thus some writers thought it implied conscious choice in the animals themselves, others that it was the personification of some active power. By many it was thought to be practically the same idea as Lamarck's. Herbert Spencer's alternative phrase, "the survival of the fittest," probably helped to spread a clear appreciation of Darwin's meaning.

The history of opinion since 1859 may be summed up as follows. Evolution soon gained general acceptance, except among a certain number of those of middle or more advanced age at the time when the *Origin* appeared. Although natural selection had been an essential force in producing this conviction, there gradually grew up a tendency to minimize its importance in relation to the causes originally suggested by Buffon and Lamarck, which were ably presented and further elaborated by Herbert Spencer. In America a school of Neo-Lamarckians appeared, and for a time flourished under the inspiration of the vigorous personality of E. D. Cope. The writings of August Weismann next raised a controversy over the scope of heredity, assailing the very foundation of the hypotheses of Buffon, Lamarck and Herbert Spencer by demanding evidence that the "acquired characters" upon which they rest are capable of hereditary transmission. The quantitative determination of heredity has been the subject of much patient investigation under the leadership of Francis Galton. The question of isolation as a factor in species-formation has been greatly discussed, G. J. Romanes proposing, in his hypothesis of "Physiological Selection," that the barrier of sterility may arise spontaneously by variation between two sets of individuals as the beginning instead of the climax of specific distinction. Others have fixed their attention upon the variations, which provided the material for natural selection, and have advocated the view that evolution proceeds by immense strides instead of the minute steps in which Darwin and Wallace believed. Others, again, have found significance in the artificial production of "monstrosities" or huge modifications during individual development. All through the period a varying proportion of naturalists, probably larger now than at any other time, has followed the founders of the theory, and has sought the motive-cause of evolution in "the accumulative power of natural selection," which Darwin, as his first public statement indicates, looked upon "as by far the most important element in the production of new forms." They hold, with Darwin and Wallace, that although variation provides the essential material, natural selection, from its accumulative power, is of such paramount importance that it may be said to create new species as truly as a man may be said to make a building out of the material provided

by stones of various shapes, a metaphor suggested and elaborated by Darwin, and forming the concluding sentences of *The Variation of Animals and Plants under Domestication*. This, probably the second in importance of all his works, was published in 1868, and may be looked upon as a complete account of the material of which he had given a very condensed abstract in the first chapter of the *Origin*, together with the conclusions suggested by it. He finally brought together an immense number of apparently disconnected sets of observations under his "provisional hypothesis of pangenesis," which assumes that every cell in the body, at every stage of growth and in maturity, is represented in each germ-cell by a gemmule. The germ-cell is only the meeting-place of gemmules, and the true reproductive power lies in the whole of the body-cells which despatch their representatives, hence "pangenesis." There are reasons for believing that this infinitely complex conception, in which, as his letters show, he had great confidence, was forced upon Darwin in order to explain the hereditary transmission of acquired characters involved in the small proportion of Lamarckian doctrine which he incorporated. If such transmission does not occur, a far simpler hypothesis based on the lines of Weismann's "continuity of the germ-plasm" is sufficient to account for the facts.

The *Descent of Man, and Selection in Relation to Sex*, was published in 1871; as the title implies, it really consists of two distinct works. The first, and by far the shorter, was the full justification of his statement in the *Origin* that "light would be thrown on the origin of man and his history." In the second part he brought together a large mass of evidence in support of his hypothesis of sexual selection which he had briefly described in the 1858 essay. This hypothesis explains the development of colours and structures peculiar to one sex and displayed by it in courtship, by the preferences of the other sex. The majority of naturalists probably agree with Darwin in believing that the explanation is real, but relatively unimportant. It is interesting to note that only in this subject and those treated of in the *Variation under Domestication* had Darwin exhausted the whole of the material which he had collected. The *Expression of the Emotions*, published in 1872, offered a natural explanation of phenomena which appeared to be a difficulty in the way of the acceptance of evolution. In 1876 Darwin brought out his two previously published geological works on *Volcanic Islands and South America* as a single volume. The widely read *Formation of Vegetable Mould through the Action of Worms* appeared in 1881. He also published various volumes on botanical subjects. The *Fertilization of Orchids* appeared in 1862. The subject of cross-fertilization of flowers was in Darwin's mind, as shown by his note-book in 1837. In 1841 Robert Brown directed his attention to Christian Conrad Sprengel's work (Berlin, 1793), which confirmed his determination to pursue this line of research. The *Effects of Cross- and Self-Fertilization in the Vegetable Kingdom* (1876) contained the direct evidence that the offspring of cross-fertilized individuals are more vigorous, as well as more numerous, than those produced by a self-fertilized parent. *Different Forms of Flowers on Plants of the Same Species* appeared in 1877. It is here shown that each different form, although possessing both kinds of sexual organs, is specially adapted to be fertilized by the pollen of another form, and that when artificially fertilized by its own pollen less vigorous offspring, bearing some resemblance to hybrids, are produced. He says, "no little discovery of mine ever gave me so much pleasure as the making out the meaning of heterostyled flowers" (*Autobiography*). *Climbing Plants* was published in 1875, although it had, in large part, been communicated to the Linnean Society, in whose publications much of the material of several of his other works appeared. This inquiry into the nature of the movements of twining plants was suggested to him in a paper by Asa Gray. *The Power of Movement in Plants* (1880) was produced by him in conjunction with his son Francis. It was an inquiry into the minute power of movement possessed, he believed, by plants generally, out of which the larger movements of climbing plants of many different groups had been evolved. The work included an investigation of other kinds of plant movement due to light, gravity, &c., all of which

he regarded as modifications of the one fundamental movement (circumnutation) which exists in a highly specialized form in climbing plants. *Insectivorous Plants* (1875) is principally concerned with the description of experiments on the Sun-dew (*Drosera*), although other insect-catching plants, such as *Dionaea*, are also investigated.

Charles Darwin's long life of patient, continuous work, the most fruitful, the most inspiring, in the annals of modern science, came to an end on the 19th of April 1882. He was buried in Westminster Abbey on the 26th. It is of much interest to attempt to set forth some of the main characteristics of the man who did so much for modern science, and in so large a measure moulded the form of modern thought. Although his ill-health prevented Darwin, except on rare occasions, from attending scientific and social meetings, and thus from meeting and knowing the great body of scientific and intellectual workers of his time, probably no man has ever inspired a wider and deeper personal interest and affection. This was in part due to the intimate personal friends who represented him in the circles he was unable frequently to enter, but chiefly to the kindly, generous, and courteous nature which was revealed in his large correspondence and published writings, and especially in his treatment of opponents.

In a deeply interesting chapter of the *Life and Letters* Francis Darwin has given us his reminiscences of his father's everyday life. Rising early, he took a short walk before breakfasting alone at 7.45, and then at once set to work, "considering the 18 hours between 8.0 and 9.30 one of his best working times." He then read his letters and listened to reading aloud, returning to work at about 10.30. At 12 or 12.15 "he considered his day's work over," and went for a walk, whether wet or fine. For a time he rode, but after accidents had occurred twice, was advised to give it up. After lunch he read the newspaper and wrote his letters or the MS. of his books. At about 3.0 he rested and smoked for an hour while being read to, often going to sleep. He then went for a short walk, and returning about 4.30, worked for an hour. After this he rested and smoked, and listened to reading until tea at 7.30, a meal which he came to prefer to late dinner. He then played two games of backgammon, read to himself, and listened to music and to reading aloud. He went to bed, generally very much tired, at 10.30, and was often much troubled by wakefulness and the activity of his thoughts. It is thus apparent that the number of hours devoted to work in each day was comparatively few. The immense amount he achieved was due to concentration during these hours, also to the unflinching and, because of his health, the necessary regularity of his life.

The appearance of Charles Darwin has been made well known in numerous portraits and statues. He was tall and thin, being about six feet high, but looked less because of a stoop, which increased towards the end of his life. As a young man he had been active, with considerable powers of endurance, and possessed in a marked degree those qualities of eye and hand which make the successful sportsman.

Charles Darwin was, as a young man, a believer in Christianity, and was sent to Cambridge with the idea that he would take orders. It is probable, however, that he had merely yielded to the influences of his home, without thinking much on the subject of religion. He first began to reflect deeply on the subject during the two years and a quarter which intervened between his return from the "Beagle" (October 2nd, 1836) and his marriage (January 29th, 1839). His own words are, "disbelief crept over me at a very slow rate, but was at last complete. The rate was so slow that I felt no distress." His attitude was that of the tolerant unaggressive agnostic, sympathizing with and helping in the social and charitable influences of the English Church in his parish. He was evidently most unwilling that his opinions on religious matters should influence others, holding, as his son, Francis Darwin, says, "that a man ought not to publish on a subject to which he has not given special and continuous thought" (*l.c.* i. p. 305).

In addition to the personal qualities and powers of Charles Darwin, there were other contributing causes without which the world could never have reaped the benefit of his genius. It is

evident that Darwin's health could barely have endured the strain of working for a living, and that nothing would have been left over for his researches. A deep debt of gratitude is owing to his father for placing him in a position in which all his energy could be devoted to scientific work and thought. But his ill-health was such that this important and essential condition would have been insufficient without another even more essential. Francis Darwin, in the *Life and Letters* (i. pp. 159-160), writes these eloquent and pathetic words:—"No one indeed, except my mother, knows the full amount of suffering he endured, or the full amount of his wonderful patience. For all the latter years of his life she never left him for a night; and her days were so planned that all his resting hours might be shared with her. She shielded him from every avoidable annoyance, and omitted nothing that might save him trouble, or prevent him becoming over-tired, or that might alleviate the many discomforts of his ill-health. I hesitate to speak thus freely of a thing so sacred as the lifelong devotion which prompted all this constant and tender care. But it is, I repeat, a principal feature of his life, that for nearly forty years he never knew one day of the health of ordinary men, and that thus his life was one long struggle against the weariness and the strain of sickness. And this cannot be told without speaking of the one condition which enabled him to bear the strain and fight out the struggle to the end."

Charles Darwin was honoured by the chief societies of the civilized world. He was made a knight of the Prussian order, "Pour le Mérite," in 1867, a corresponding member of the Berlin Academy of Sciences in 1863, a fellow in 1878, and later in the same year a corresponding member of the French Institute in the botanical section. He received the Bressa prize of the Royal Academy of Turin, and the Baly medal of the Royal College of Physicians in 1879, the Wollaston medal of the Geological Society in 1859, a Royal medal of the Royal Society in 1853, and the Copley medal in 1864. His health prevented him from accepting the honorary degree which Oxford University wished to confer on him, but his own university had stronger claims, and he received its honorary LL.D. in 1877.

Two daughters and five sons survived him, four of the latter becoming prominent in the scientific world.—Sir George Howard (b. 1845), who became professor of astronomy and experimental philosophy at Cambridge in 1883; Francis (b. 1848), the distinguished botanist; Leonard (b. 1850), a major in the royal engineers, and afterwards well known as an economist; and Horace (b. 1851), civil engineer.

See *The Life and Letters of Charles Darwin, including an auto biographical chapter*, edited by his son Francis Darwin (3 vols., London, 1887); *Charles Darwin and the Theory of Natural Selection*, by E. B. Poulton (London, 1896); *Life and Letters of Thomas Henry Huxley*, by Leonard Huxley (2 vols., London, 1900); A. R. Wallace, *Darwinism* (1889); G. J. Romanes, *Darwin and after Darwin* (1895). Also the article on T. H. HUXLEY. (E. B. P.)

DARWIN, ERASMUS (1731-1802), English man of science and poet, was born at Elton, in Nottinghamshire, on the 12th of December 1731. After studying at St John's College, Cambridge, and at Edinburgh, he settled in 1756 as a physician at Nottingham, but meeting with little success he moved in the following year to Lichfield. There he gained a large practice, and did much, both by example and by more direct effort, to diminish drunkenness among the lower classes. In 1781 he removed to Derby, where he died suddenly on the 18th of April 1802. The fame of Erasmus Darwin as a poet rests upon his *Bolanic Garden*, though he also wrote *The Temple of Nature*, or *the Origin of Society*, a Poem, with Philosophical Notes (1803), and *The Shrine of Nature* (posthumously published). The *Bolanic Garden* (the second part of which—*The Loves of the Plants*—was published anonymously in 1789, and the whole of which appeared in 1791) is a long poem in the decasyllabic rhymed couplet. Its merit lies in the genuine scientific enthusiasm and interest in nature which pervade it; and of any other poetic quality—except a certain, sometimes felicitous but oftener ill-placed, elaborated pomp of words—it may without injustice be said to be almost destitute. It was for the most part written laboriously, and polished with