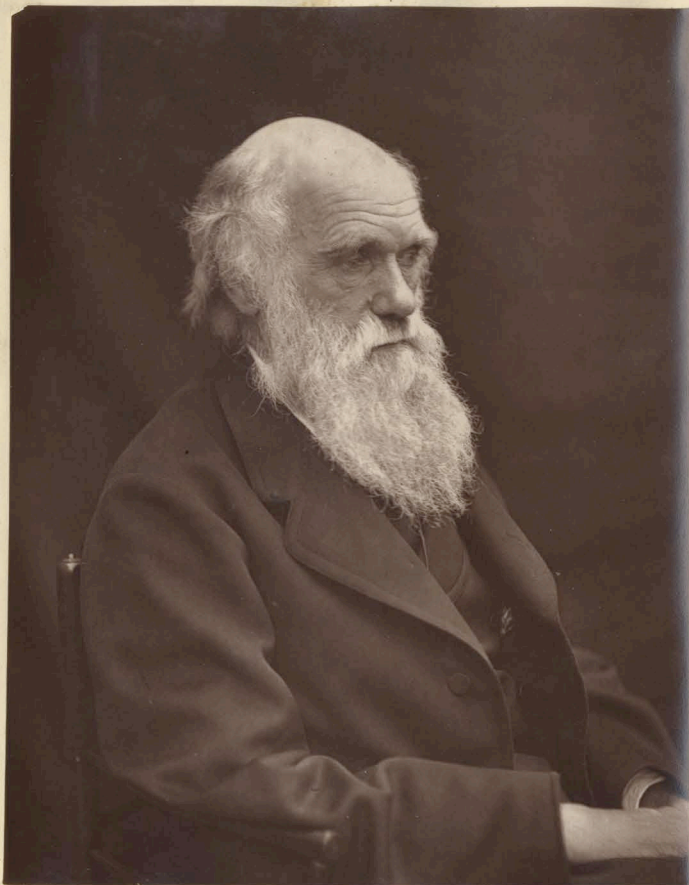


Charles Darwin.





Jan 14 1881
C. Darwin

CHARLES DARWIN.

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REMEMBER his constancy in every act which was conformable to reason, and his evenness in all things, and his piety, and the serenity of his countenance, and his sweetness, and his disregard of empty fame, and his efforts to understand things; and how he would never let anything pass without having first most carefully examined it and clearly understood it; and how he bore with those who blamed him unjustly without blaming them in return; how he did nothing in a hurry; and how he listened not to calumnies, and how exact an examiner of manners and actions he was; and not given to reproach people, nor timid, nor suspicious, nor a sophist; and how laborious and patient; and his firmness and uniformity in his friendships; and how he tolerated freedom of speech in those who opposed his opinions; and the pleasure that he had when any man showed him anything better; and how religious he was without superstition. Imitate all this, that thou mayest have as good a conscience, when thy last hour comes, as he had.—*Marcus Aurelius*.

CHARLES DARWIN.

NEARLY a hundred years ago, Erasmus Darwin, who was then living at Derby, brought his third son, Robert Waring, to Shrewsbury, and left him there with twenty pounds in his pocket. Another twenty pounds was afterwards sent to the young doctor by his uncle, the Rector of Elston, and with this capital he established the large and lucrative practice which for more than half a century made his portly figure and his yellow chaise familiar to the inhabitants of three or four counties.¹ It was in 1786, when he was twenty years of age, that Robert Darwin settled at Shrewsbury. His success was so rapid that he soon bought a piece of land adjoining the Holyhead road, to the north-west of the town, where he built himself a house in a charming situation high above the Severn; and to "The Mount," in 1796, he brought his wife, Susannah, the eldest daughter of Josiah Wedgwood of Etruria. There, on the 12th of February, 1809, Charles Robert Darwin was born, the descendant of two families which show a remarkable succession of talent in several generations. Mr. Francis Galton, another grandson of Erasmus Darwin's, in his work on *Hereditary Genius*, mentions seven of the doctor's descendants who have distinguished themselves. He does not include himself, but Charles

¹ I am indebted to Charles Darwin's "Preliminary Notice" to *Erasmus Darwin* by Ernst Krause for several of the facts mentioned in this paper; to the late Miss Meteyard's *Life of Josiah Wedgwood*; and to the same lady's *Group of Englishmen*, an account of the younger Wedgwoods. Miss Meteyard was the daughter of Mr. Meteyard, surgeon to the Shropshire Militia, and spent her early days in Shrewsbury.

Darwin says of him—"I feel sure that Mr. Francis Galton will be willing to attribute the remarkable originality of his mind in a large part to inheritance from his maternal grandfather."¹

In an archæological publication no excuse is needed for beginning a paper on Darwin with some account of his ancestry, but it is particularly interesting to observe the circumstances and tendencies in both his father's and mother's families which certainly had something to do with the evolution of his genius and character. The first of the Darwins of whom anything is known was William, yeoman of the armoury of Greenwich in the time of James I. and Charles I., and the owner of a small estate at Cleatham in Lincolnshire. His son William, a cavalry officer who suffered heavy loss as a royalist, married the daughter of Erasmus Earle, sergeant-at-law; and the wife of their eldest son, another William, was heiress of Robert Waring of Wilsford, Nottinghamshire; from which unions Charles's father and grandfather derived their Christian names.

It was one of the two sons of William Darwin and Miss Waring, Robert Darwin of Elston, father of Erasmus, who, first of the family, as far as we know, showed those scientific tastes which have made the name illustrious. He was an early member of the Spalding Club, and Stukeley, the antiquary, writing in the *Philosophical Transactions* of April and May, 1719,

¹ If Mr. Galton had devoted a chapter to "Inventors" he must have included the Wedgwoods. Thomas, Josiah Wedgwood's youngest son, the generous friend of Coleridge, was a man of rare intelligence, and Miss Meteyard collects a good deal of evidence to show that he was the inventor of the photograph. Amongst the writers of our own day the name of Wedgwood survives; and another descendant was Sir Henry Holland, the author and physician. His grandmother was sister of Josiah Wedgwood, of whom he says—"This admirable man was endeared to all around him in domestic and social life. Even as a child I received kindnesses from him, which I gladly keep in remembrance. Through him I came into family connection with his eminent grandson, Charles Darwin, a long and intimate friendship with whom I have more pleasure in recording than any family tie."—*Recollections of Past Life*.

says he has an account from his friend Robert Darwin, "a person of curiosity," of "a human Skeleton impressed in stone, found lately by the Rector of Elston . . . the like whereof has not been observed before in this island, to my knowledge." Robert Darwin had four sons, of whom both the eldest and the youngest were authors and botanical students. The former, Robert Waring of Elston, published *Principia Botanica*, which reached the honour of at least a third edition; of the youngest, Erasmus, who was born at Elston Hall, near Newark, in Nottinghamshire, in December, 1731, Dr. Krause says that "equally eminent as philanthropist, physician, naturalist, philosopher, and poet, he is far less known and valued by posterity than he deserves." An English critic of the present day would not write in this way of Erasmus Darwin's poetry, but the price given for the second instalment of the *Botanic Garden*, a thousand guineas, is sufficient proof of its remarkable popularity at the time, and Horace Walpole declares that the "Triumph of Flora" contains "the most sublime passage in any author, or in any of the few languages with which I am acquainted"! Canning's parody shattered Erasmus Darwin's poetic reputation, and now the "happier lays" which almost excited Cowper's envy would be completely forgotten if the writer had not won a more enduring fame as a student of nature, an original thinker, and a vigorous friend of humanity. Yet, so unsuccessful was he in convincing his contemporaries, that a writer in the second volume of the *Edinburgh Review* says his "reveries in science have probably no other chance of being saved from oblivion" than that which they derive from their poetic form. In some points he and his grandson, who has converted these reveries in science into accepted truths, differed greatly; but it is impossible to study the lives of Erasmus and Charles without being struck by the likeness between Dr. Darwin of Lichfield and his more illustrious descendant. Erasmus, indeed, was the intellectual father of Charles, and was in many ways an

excellent man, but in the life of the grandson virtue as well as genius seemed to reach almost their ripest development.

Dr. Darwin's first wife, Mary Howard, a charming woman, with whom he lived in great happiness, died in 1770, leaving Robert Waring, then a child of four, and two elder sons. In 1781 the doctor married the widow of Colonel Chandos Pole, and in 1802 he died at Bread-sall Priory, near Derby.¹ It was near the close of his life, in 1794, that he published *Zoonomia*, which was at once translated into German, French, and Italian, and which excites fresh interest now, because, amidst much that is fanciful and extravagant, it suggests the theory of Evolution established by the researches and experiments of his grandson. In 1800 the *Zoonomia* was followed by *Phytologia*, or "The Philosophy of Agriculture and Gardening;" and the *Temple of Nature*, a didactic poem, appeared the year after the writer's death. In all these works, as well as in the *Botanic Garden*, the curious student finds many observations shadowing forth the conclusions which have been reached in a more scientific way by the author of the *Descent of Man*. The "expression of the emotions," the "variation of animals under domestication," the "fertilization of plants," the "origin of species," the "struggle for existence," identified as they now are with the name of Charles Darwin, all come within the range of his grandfather's speculations; and, summing up his observations, he asks whether we may "conjecture that one and the same kind of living filaments is and has been the cause of all organic life."

"A fool, Mr. Edgeworth, you know, is a man who

¹ Of Dr. Darwin's sons, Charles (by his first wife) was a medical student of great promise, who died young; and Francis (by his second wife), a physician, shared the family taste for natural history. He "travelled far in countries rarely visited, and kept a number of wild and curious animals." One of his sons, Captain Darwin, has published the *Gamekeeper's Manual*, which (says Charles Darwin) "shows keen observation and knowledge of the habits of various animals."

never tried an experiment in his life." Erasmus Darwin, who gave this definition of a fool, made many experiments. He took a keen interest in mechanics, as his grandson did, and one of his inventions, a horizontal windmill, was used by Wedgwood for grinding flints; but in most cases he scarcely went beyond sketches and suggestions. So it is with his studies in biology and natural history. Here, also, what he gives us is a sketch or a suggestion, instead of facts built up on many converging proofs. That was the work reserved for his grandson, who could never have apologized, as Erasmus did, "for many conjectures not supported by accurate investigation or conclusive experiments." For Charles Darwin was so far removed from his grandfather's definition of a fool, that he could spend thirty years over a single experiment, and he waited to present his theories to the world until they seemed to be established by the accumulated results of observation and experience. The grandson fell upon happier times, when men's minds were more open to receive new theories, but it required Charles Darwin's peculiar genius to convert the speculations of Erasmus, and of still earlier thinkers, into the foundations of scientific knowledge.

Darwin speaks of his grandfather's "prophetic sagacity," and the phrase is well applied. In many domains of human activity he foresaw what has been since accomplished. It was years before the first locomotive was constructed when he wrote—

Soon shall thy arm, Unconquered Steam, afar,
Drag the slow barge or drive the rapid car;

and in other fields besides that of science he was before his time: which has been characteristic of the Darwins. For many years he was a teetotaler, before teetotalism was heard of in this country, and he is credited with having diminished to a sensible extent the practice of drinking amongst the gentry of the county. He advocated a more humane treatment of the insane; he denounced slavery fifty years before it was abolished;

and his views on education and sanitary reform have waited almost until our own time to be carried into practice. He was distinguished, not only by his general benevolence, but by his considerate kindness to his dependents, and on this subject Charles Darwin tells a story which may be introduced here because it has some local interest. Writing to his son at Shrewsbury, with reference to a small debt, Erasmus asks him to use the money in buying a goose pie, for which, it seems, Shrewsbury was then famous, and to send it at Christmas to an old woman at Birmingham; "for she, as you may remember, was your nurse, which is the greatest obligation, if well performed, that can be received from an inferior."

In Josiah Wedgwood (Charles Darwin's maternal grandfather), says Miss Meteyard, "the ability of generations culminated in genius;" and it is a very attractive picture which she draws of the great potter, and his family, and friends, amongst the most intimate of whom were the Darwins. The Wedgwoods, coming from Weggewode, near Newcastle-under-Lyne, appear to have settled in the neighbourhood of Burslem early in the middle ages, and one of the family, named John, "resided at Dunwood, near Leek, towards the close of the fifteenth century." In course of time the Wedgwoods married and intermarried with the Burslems of Burslem, and had many children; and the landed property, at first considerable, was much divided, so that, towards the end of the seventeenth century, several members of the family took up the trade of the district and handed it down to their descendants. Thomas Wedgwood the potter, born in 1687, married the daughter of Mr. Stringer, a Dissenting minister, who is supposed to have been connected with Shropshire by birth or descent. He was "a man of superior attainments and high moral worth," and his noble character, as Miss Meteyard justly says, certainly did not die with him. The youngest child of this marriage, Josiah Wedgwood, was born at the Churchyard House,

Burslem, in 1730, and became the grandfather of one who only passed from amongst us a little more than two years ago.

The large family of which Josiah Wedgwood was the youngest were brought up by a mother of "unusual quickness, sensibility, and kindness of heart," and a father who is described as "acute, kindly, independent, patriotic." While he was still young Josiah began to learn the potter's handicraft, and soon showed signs of the talent that made his name famous. His patience was the patience of genius, afterwards so conspicuous in his grandson; to whom indeed the words which Miss Meteyard uses of Josiah Wedgwood could be applied exactly as they stand—"Patient, steadfast, humble, simple, unconscious of half his own greatness, and yet by this very simplicity, patience, and steadfastness, displaying the high quality of his moral and intellectual characteristics, even whilst insuring that each step was in the right direction and firmly planted." Experiment after experiment would fail, but Wedgwood persevered until his end was accomplished, and a fresh process of manufacture was discovered, or some new thing of beauty was produced. In January, 1764, he married his distant cousin, Sarah Wedgwood, of Spen Green in Cheshire, a woman beautiful both in character and in outward form; and at their happy home, the Brick House, Burslem, their eldest daughter, Susannah, the mother of Charles Darwin, was born at the end of the year.

Six years afterwards Mr. Wedgwood removed to Etruria Hall, where most of his eldest daughter's life was spent until she came to her new home at Shrewsbury. Her father was brought into friendly relations with persons of all ranks, and was still more fortunate in enjoying the intimacy of men of genius, who often visited Etruria. The hall, we are told, must have borne the appearance of an hotel; "guests were coming and going, foreigners from every country were occasionally there, and distinguished Englishmen formed

a large proportion" of the company. "Each day the dinner-table was laid for unexpected as well as expected guests, for it was never known who might arrive before or after the meal was served." In the midst of the most generous hospitality there was great simplicity of life. Writing to his partner Bentley in 1778 Wedgwood says—"Sukey is now very well and is pretty strong, which I attribute to riding on horseback. We sally forth, half-a-dozen of us, by five or six o'clock in the morning, and return with appetites scarcely to be appeased. Then we are very busy in our hay, and have just made a new garden. Sometimes we try experiments, then read and draw a little, that altogether we are very busy folks, and the holidays will be over much sooner than we could expect them to be." Gardening was a favourite occupation of Mr. Wedgwood's, with his daughters as his constant companions; and Susannah, as we shall see, carried her love for it into her new life at Shrewsbury. Mr. Wedgwood's high and honourable character must have influenced all his family; and in the fireside talk at Etruria Hall the children often heard of other things besides literature and art; of the efforts that were being made to abolish the slave trade, for example, and the part which was played in the movement by Wedgwood's well-known intaglio, a kneeling slave in chains, surrounded by the now famous motto, "Am I not a man and a brother."

Early in Wedgwood's life he was friendly with the Darwins, and the friendship grew as time went on. How intimate it became at last we learn from the correspondence between Wedgwood and Erasmus Darwin, who in one of his letters writes—"Mrs. Darwin says she hears your whole family are going to town in a body, like a caravan going to Mecca; and we therefore hope you will make Derby a resting-place, and recruit yourselves and your camels for a few days, after having travell'd over the burning sands of Cheadle and Uttoxeter." The sons and daughters of the two

families were much together from their childhood. At one time Robert Darwin was staying with the Wedgwoods to study chemistry; Susannah was often at Derby; and so the intimacy grew between two of the young playmates which ended at last in marriage. Miss Wedgwood spent part of her early life in London with the Bentleys, and went to school there, laying "the foundation of that excellent scholarship which was so useful to her busy husband in after years," and was also employed, we believe, in directing Charles Darwin's earliest studies. In 1777 we hear of her spending the Christmas holidays as the guest of Mr. and Mrs. Edgeworth, who formed a high opinion of her character, and wherever she went Miss Wedgwood seemed to win a new store of affection. Dr. Darwin, with whom she was a great favourite, lived to see her his daughter-in-law, but her own father died in 1795, the year before she was married.

Charles Darwin says of his father, that "he did not inherit any aptitude for poetry or mechanics, nor did he possess, as I think, a scientific mind. I cannot tell why my father's mind did not appear to me fitted for advancing science; for he was fond of theorizing, and was incomparably the most acute observer whom I ever knew. But his powers in this direction were exercised almost wholly in the practice of medicine, and in the observation of human character." His memory for the dates of certain events was so extraordinary, that "he knew the day of the birth, marriage, and death of most of the gentlemen of Shropshire"; but this remarkable power distressed him, because it brought back painful occurrences and prolonged his grief for the loss of friends. A golden rule of Dr. Darwin's was "never to become the friend of anyone whom you could not thoroughly respect, and I think (says Charles Darwin) he always acted on it. But of all his characteristic qualities, his sympathy was pre-eminent, and I believe it was this which made him for a time hate his profession, as it constantly brought suffering before his eyes. Sym-

pathy with the joy of others is a much rarer endowment than sympathy with their pains, and it is no exaggeration to say that to give pleasure to others was to my father an intense pleasure." There is something peculiarly interesting in this picture of the father's character drawn by his son, who inherited so abundantly the habit of observation as well as the sympathetic nature which he describes.

Dr. Darwin had studied at Edinburgh, where he took high honours, and at Leyden, and travelled in Germany, before he settled down to his life-long practice in 1786. The young doctor had many rivals at Shrewsbury, but his learning and his talents soon won for him a leading position. Amongst the Shrewsbury apothecaries was William Clement (father of the late member for the borough), whose career was coincident with Darwin's.¹ The county town "was still in a great measure what it had long been, the metropolis of the adjacent country," and the resort of the county

¹ Miss Meteyard gives an interesting description of some of the Shrewsbury doctors:—"Nowhere was Dr. Darwin seen to such advantage as in the invariable yellow chaise. This, and his burly form and countenance within, were known to every man, woman, and child over a wide extent of country. Like old Samuel Butler, the mighty schoolmaster who always receipted his bills 'with thanks,' Dr. Darwin was as much a feature of the town as the river, the abbey, and the schools; and many was the stranger who lingered to see them both. At length, when that long day's work was done—and it was a very long and hard one—his portly form vanished from the streets, and he, too, departed to that quiet resting-place beside his favourite Severn. He died on the 13th day of November, 1848, aged 82 years. Dr. Darwin survived two of his more eminent medical contemporaries in the town, Mr. Sutton and Dr. Dugard. The latter a pale, portly little man, unlike farmer-looking Dr. Darwin, had the air and appearance of a court physician. He wore powder, orthodox black, highly polished Hessian boots with big tassels, ponderous seals, an important frill of snowy lawn, and he carried the professional cane. The elder Clement, who had been the pupil and friend of the great Jenner, known Coleridge, Wordsworth, Southey, Hazlitt, Thelwall, and Horne Tooke, and stood forth as the unflinching advocate for Parliamentary Reform and civil and religious liberty in this most aristocratic borough in the kingdom, died at the age of 90, in January, 1853. He had the countenance of a philosopher."

families, with many of whom it was not yet the custom to spend the season in London. "Balls, suppers, oyster-feasts, meets of hounds, and an occasional visit from a party of strolling players," made up the winter's festivities, in which the Darwins soon began to take their part; for in June, 1807, we find the doctor's wife, in a letter to her brother Josiah Wedgwood (who was to become Charles Darwin's father-in-law), saying that they can wait for their new dinner-service, because "it is not the custom in this town to give dinners in summer." Shrewsbury "still wore much of its middle-age aspect." Most of the houses of the better sort differed little in style from what they were in the days of the Tudors; many of the shops "displayed their wares on baulks and hanging shutters;" the streets were badly paved and scarcely lighted at all. Coming to this quaint old town, Robert Darwin took up his residence on St. John's Hill, but in a short time the property at The Mount was bought, and the house built in which he settled down, after his marriage, for fifty years more of prosperous life. This was in 1796,¹ a little less than two years before Coleridge visited Shrewsbury, and preached, at the Unitarian Chapel still standing in High-street, the famous sermon which Hazlitt heard after his comfortless walk in the mud from his home at Wem, and "could not have been more delighted if he had heard the music of the spheres." The Darwins were most likely present when the poet's voice "rose like a steam of rich-distilled perfumes," as he gave out the text, "And He went up into the Mountain to pray, Himself, Alone." Coleridge staid with the Tayleors, who were old friends of the Wedgwoods', at their house on St. John's Hill, near the Quarry; and the poet was inclined to become the minister of High-street Chapel, when Mrs. Darwin's brothers intervened, with their offer of £150 a year, in

¹ "April 18, 1796, married at St. Marylebone Church, Dr. Darwin of Shrewsbury, to Miss Wedgwood, eldest daughter of the late Josiah Wedgwood of Etruria, Staffordshire." *Gent. Mag.*, Vol. LXVI., p. 351.

order that he might devote himself to literature. At that place of worship, a few years afterwards, Charles Darwin attended with the family from The Mount; and thus High-street Chapel is associated with two of the greatest names of the nineteenth century.

Charles Darwin was born at The Mount on the 12th of February, 1809.¹ The house (of which we give an engraving from a sketch taken for this paper) lies above the steep banks of the Severn, on the outskirts of the town, and is a conspicuous object from the Great Western Railway, on the left, as the train leaves Shrewsbury Station for Chester.² At the time of Charles Darwin's birth, his mother was in declining health. Two years earlier, when she had already several children round her, she wrote to a friend—"Everyone seems young but me;" and in July, 1817, when Charles was between eight and nine, she died. Young as he was, she seems to have impressed his mind by her teaching, for one of his schoolfellows, the Rev. W. A. Leighton, remembers him plucking a plant, and recalling one of her elementary lessons in botany; but in later life Charles retained only the

¹ "1809, November 17, Darwin, Charles Robert, }
son of Robert and Mrs. Susannah his wife, born } C[hristened].
February 12th." *From the Parish Register of St. Chad's, Shrewsbury.*

² The house is seen from the line immediately beyond the low tower of St. George's Church. Visitors who make a pilgrimage there, after crossing the Welsh Bridge, follow the main street until St. George's Church is passed, and the continuous line of houses ceases. The next carriage drive, on the right, cutting in two a lofty side-walk, is the entrance to The Mount. A short street of new houses near St. George's Church has been called "Darwin Street"; as yet the only public recognition in the town of the greatest of Salopians. A memorial of a more private character has been placed in the Unitarian Chapel, in the form of a tablet bearing the following inscription:—"To the memory of Charles Robert Darwin, author of the 'Origin of Species,' born in Shrewsbury, February 12th, 1809. In early life a member of and constant worshipper in this Church. Died April 19th, 1882." Mrs. Darwin, we believe, was not strict in her adhesion to the communion in which she had been brought up, but often attended St. Chad's Church where Charles and his brother were baptised.



THE MOUNT, SHREWSBURY.

Where Darwin was born.

vaguest recollections of his mother. Besides Charles, the family consisted of an elder son, Erasmus, and four daughters, one of whom married Dr. Parker of Shrewsbury (where his son, the Rev. Charles Parker, still resides), while another became the wife of her cousin, Mr. Wedgwood. It is a singular fact that Miss Darwin, her brother Charles, their father, and their grandfather, himself a Wedgwood, all married Wedgwoods. Erasmus Darwin, who died September 2nd, 1881, will be remembered as the friend of the Carlyles. "Erasmus Darwin, a most diverse kind of mortal, came to seek us out very soon, and continues ever since to be a quiet house-friend, honestly attached. He had something of original and sarcastically ingenious in him, one of the sincerest, naturally truest, and most modest of men. . . . E. Darwin it was who named the late Whewell, seeing him sit, all ear (not all assent) at some of my lectures, 'the Harmonious Blacksmith;' a really descriptive title. My dear, one had a great favour for this honest Darwin always; many a road, to shops and the like, he drove her in his cab ('Darwingium Cabbum' comparable to Georgium Sidus), in those early days when even the charge of omnibuses was a consideration, and his sparse utterances, sardonic often, were a great amusement to her. 'A perfect gentleman,' she at once discerned him to be, and of sound worth and kindness, in the most unaffected form. 'Take me now to Oxygen-street, a dyer's shop there!' Darwin, without a wrinkle or remark, made for Oxenden-street, and drew up at the required door. Amusingly admirable to us both, when she came home."¹ The graphic sketch of Erasmus is worth giving here, throwing another gleam of light for us on the family of the Darwins. Erasmus, in his modesty, and kindness of heart, and quiet humour, must have resembled Charles, to whom Carlyle "rather preferred him for intellect"!

¹ *Reminiscences*, by Thomas Carlyle. Vol. II., p. 207-9.

There could hardly have been a better home than Charles Darwin's for the training of a young naturalist; the "acute observer" at the head of it, and the mother, adding to her gentle, sympathizing nature, a cultivated intelligence and a keen delight in her husband's pursuits. Together they took an interest in botany and zoology, and the gardens of The Mount, by the time Charles was old enough to play in them, were filled with rare shrubs and trees, and beautiful flowers.¹ They petted and reared birds and other animals, and it is particularly interesting, remembering the important position which pigeons afterwards occupied in Charles Darwin's investigations, to read that "the beauty, variety, and tameness of The Mount pigeons were well known in the town and far beyond." After Mrs. Darwin's death the doctor's daughters helped him in his many acts of kindness to the poor. Together they established one of the first Infant Schools in Shrewsbury (close to Millington's Hospital in Frankwell, on land leased by the trustees of that charity), and, with characteristic readiness to welcome every improvement, furnished it with the appliances which had lately been introduced by Pestalozzi and other educational reformers. In his late years, Dr. Darwin was called the "Father of Frankwell," the suburb of Shrewsbury in which The Mount is situated. He died on the 13th of November, 1848, and at his funeral the poor, who lost in him a wise and life-long friend, and even the children, whom he always noticed with kindly affection, publicly shewed their grief at his departure.²

¹ "The Dr. sends you by tomorrow's Coach some suckers of the white Poplar, and as they have good roots, he has no doubt of their growing. If you want more, say so, and they shall be sent. It is the common white Poplar. It is become so fashionable a tree that Lady Bromley has sent for some cuttings for Baroness Howe to decorate Pope's Villa at Twickenham, as all his favourite trees have been cut down."—*Mrs. Darwin to Josiah Wedgwood*, February 8, 1808.

² "That, like his son, he was benevolently inclined, may be inferred from a little anecdote which we once heard Mr. Darwin tell of him while speaking of the curious kinds of pride which are sometimes

He was buried by the side of his wife at Montford Church, near the banks of the Severn, a few miles from Shrewsbury. Dr. Darwin had passed his four score years, but it is hard to realise that one who is still remembered by many of the inhabitants of Shrewsbury married the granddaughter of a man born before the Revolution of 1688.

Of Charles Darwin's boyhood we know little. A few of his schoolfellows are still living in his native town; the Rev. W. A. Leighton, the esteemed editor of these Papers, and the venerable Vicar of St. Chad's, the Rev. John Yardley, amongst them; but sixty years have passed, and blurred the memory of his early days. We believe a short account of them, written by Mr. Darwin himself, is to be published by one of his sons. It was in the Spring of 1817, soon after completing his eighth year, that Charles entered the school kept by the Rev. George Case, minister of the Unitarian Church. In the midsummer of 1818, he was removed to the Shrewsbury Grammar School,¹ where the Rev. Dr. Kennedy (who

shown by the poor. For the benefit of the district in which he lived Dr. Darwin offered to dispense medicine gratis to any one who applied and was not able to pay. He was surprised to find that very few of the sick poor availed themselves of his offer, and guessing that the reason must have been a dislike to becoming the recipients of charity, he devised a plan to neutralise this feeling. Whenever any poor persons applied for medical aid, he told them that he would supply the medicine, but that they must pay for the bottles. This little distinction made all the difference, and ever afterwards the poor used to flock to the doctor's house for relief as a matter of right."—*G. J. Romanes in "Nature."*

¹ For the engraving we are indebted to the editor of the *Leisure Hour*, in which an interesting account of Shrewsbury School appeared in September, 1878. The school is now removed to Kingsland, outside the town, and the old building has been purchased for a Free Library and Museum, in which the many objects of interest belonging to our Society will be deposited. Some of Mr. Darwin's admirers regret that advantage was not taken of this opportunity of doing honour to his memory in an appropriate way, by converting his old school into the "Darwin Institute and Museum," where the studies to which his life was devoted might be pursued by the youth of his native town.

succeeded Dr. Butler as head master) was also one of his schoolfellows. Shrewsbury had gained a considerable reputation under the rule of Dr. Butler;¹ but Dr. Butler's most illustrious pupil looked back upon much of the time spent there as little better than wasted; and although it is for classics that the school is distinguished, he used to say that Euclid, done as an extra subject, was the only bit of real education which he got there! He patched together his verses with "scraps and endings," of which he had what was considered a fine collection; and he often regretted the time given to classics, saying that, as far as he was concerned, he considered them of little or no advantage. In this he reminds us of his uncle Charles, who had similar tastes, and of his grandfather Erasmus, both of whom believed that "the vigour of the mind languished in the pursuit of classical elegance."

It is not surprising, therefore, that Charles made no mark at school, for, while he disliked the studies through which distinction could be won, he seems to have taken little part in the games of his schoolfellows. Mr. Leighton, who, as an older boy, sometimes heard Charles his lessons, speaks of him as reserved; and it is certain that he was fond of long, solitary rambles, and had a habit of losing himself in thought, which is not favourable to athletics. Amongst the few events remembered of his early days, is a fall that he had, while walking on the old walls of the town, in a "brown study." Mr. Yardley's recollections differ somewhat from Mr. Leighton's. The Vicar of St. Chad's speaks of Charles Darwin as "cheerful, good-tempered and communicative," qualities which certainly distinguished him in after life, and it is probable that, holding aloof from the ordinary amusements of his classmates, he was sociable with those who entered into his own pursuits. As early as

¹ Appointed head master in 1798; became Bishop of Lichfield in 1836.



OLD SHREWSBURY SCHOOL.

(Where Darwin was educated).

1817 he had a passion for collecting; shells, seals, franks, coins, minerals, were amongst the miscellaneous objects of his search; but there is no clear sign during his boyhood at Shrewsbury of any strong devotion to the studies that afterwards absorbed his attention, though he was only a youth of eighteen when his first discovery was made. As a boy, he had the keen delight in understanding a piece of mechanism which afterwards showed itself in many ways, and he remembered vividly the pleasure his uncle Josiah Wedgwood gave him, when he was young, by explaining the principle of the vernier.

In 1825 he left Shrewsbury for Edinburgh University, where his father and grandfather had studied; and we have no record of his connection with his native place after that date, though he doubtless often came there to visit Dr. Darwin, who lived for twenty three years longer, and had the satisfaction of seeing his son already taking high rank in the world of science.¹ In fact, Charles Darwin's career as author and discoverer extended over more than half a century, beginning when he was eighteen, and ending with the publication of his book on *Earth Worms* not long before he died. He joined the Plinian Society at Edinburgh, and his first recorded contribution to Science was a communication on the Ova of the Flustra, on the 27th of March, 1827, stating that he had discovered organs of motion. Thus early in life his powers of observation were exercised in the field in which he afterwards distinguished himself.

¹ Mr. Darwin occasionally corresponded with his old schoolfellow, the Rev. W. A. Leighton, who also devoted himself to the study of botany; and one of the letters which passed between them will be found further on in these pages. In another, Mr. Darwin says—"How many years have rolled over our heads since we were at school together, and how little we then thought that we should correspond on scientific subjects." Mr. Leighton and Mr. Darwin met again, after leaving school, as fellow students at Cambridge, and both took part in Professor Henslow's field excursions, which are mentioned further on, and attended the evening parties at his house.

Of his life at Edinburgh we have one or two glimpses. In his sketch of Erasmus Darwin, he refers to it himself, saying that when he was a young medical student there, forty seven years after the death of his uncle Charles, Professor Andrew Duncan, who knew him, was still at Edinburgh, and spoke of him with the warmest affection; and Mr. W. F. Ainsworth, writing in the *Athenæum* in May, 1882, says—"Mr. Darwin and myself made frequent excursions on the shores of the Firth of Forth in pursuit of objects of natural history, sometimes to the coast of Fifeshire, and sometimes to the islands. On one occasion we went, accompanied by Dr. Greville, the botanist, to the Isle of May, and we were both exceedingly amused at the effect produced upon the eminent cryptogamist by the screeching of the kittiwakes and other waterfowl. He had actually to lie down on the greensward to enjoy his prolonged cachinnation. Another time we were benighted on Inch Keith, but found refuge in the lighthouse. Mr. Darwin also carried on his researches with Dr., afterwards Professor, Grant, and it was the same year, I believe, the doctor first found silica in sponges." All this helps to show that Darwin had begun to study natural history before he enjoyed the great advantage of Professor Henslow's friendship at Cambridge, though he himself speaks of Henslow's influence as if it had almost given the bent to his pursuits. He went to Edinburgh to enter the medical profession, but this was probably decided by the traditions of the family, not by his own inclinations, which speedily carried him into a different career.

Mr. Darwin spent part of two years at Edinburgh, and entered Christ's College, Cambridge, early in 1828; his father hoping, it is said, that he might exchange the profession of medicine for that of Holy Orders. His University career was not a distinguished one. He took the ordinary degrees, B.A. in 1831, as tenth in the *οι πολλοι*, and M.A. in 1837; but the field of knowledge in which he was already a successful explorer was not likely in

those days to bring him much distinction as a student. It was his good fortune, however, to become acquainted with Professor Henslow, and that was more to him than all the academic honours of Cambridge could be.¹ It is not true, as we have seen, that Henslow started Darwin on his career as a naturalist, though the statement derived some show of truth from the student's ardent expressions of gratitude to his master.² Apart from the fact that Darwin had made discoveries in natural history at Edinburgh, and wandered on the Firth of Forth in search of specimens, it was through his "brother entomologists," mentioned in the letter given below, that he became acquainted with Henslow; which disproves the remark of one writer, that Henslow "aroused the first love and the early study of natural science in the mind of Darwin." At the same time there can be no doubt that Professor Henslow exercised a great influence over his pupil, and fostered, not only his intellectual tastes, but those great moral qualities in which there was so striking a resemblance between them, that, as Dr. Romanes has said, Darwin, in an account which he wrote of his teacher's character, "unconsciously gives a most accurate description of his own." The letter containing this description appears in the *Memoirs of the late Professor Henslow*, by the Rev. L. Jenyns, and it affords a pleasant insight into Darwin's life at Cambridge.

I went to Cambridge early in the year 1828, and soon became acquainted, through some of my brother entomologists, with Professor Henslow, for all who cared for any branch of natural history were equally encouraged by him . . . When I reflect how immediately we felt at perfect ease with a man

¹ It is interesting to note that thirty years afterwards, when the *Origin of Species* had appeared, Henslow, then a parish clergyman, accepted Mr. Darwin's conclusions as highly probable, and, in the face of some obloquy, publicly avowed his belief.

² "I must be here allowed to return my most sincere thanks to the Reverend Professor Henslow, who, when I was an undergraduate at Cambridge, was one chief means of giving me a taste for Natural History."—Preface to "*Journal of Researches*."

older and in every way so immensely our superior, I think it was as much owing to the transparent sincerity of his character, as to his kindness of heart; and perhaps even still more to a highly remarkable absence in him of all self-consciousness. One perceived at once that he never thought of his own varied knowledge or clear intellect, but solely on the subject in hand. Another charm, which must have struck every one, was that his manner to old and distinguished persons and to the youngest student was exactly the same: to all he showed the same winning courtesy. He would receive with interest the most trifling observation in any branch of natural history; and however absurd a blunder one might make, he pointed it out so clearly and kindly, that one left him no way disheartened, but only determined to be more accurate the next time . . . Once every week he kept open house in the evening, and all who cared for natural history attended these parties. . . . When only a few were present, I have listened to the great men of those days, conversing on all sorts of subjects, with the most varied and brilliant powers. This was no small advantage to some of the younger men, as it stimulated their mental activity and ambition. Two or three times in each session he took excursions with his botanical class; either a long walk to the habitat of some rare plant, or in a barge down the river to the fens, or in coaches to some more distant place, as to Gamlingay, to see the wild lily of the valley, and to catch on the heath the rare natter-jack. These excursions have left a delightful impression on my mind. He was, on such occasions, in as good spirits as a boy, and laughed as heartily as a boy at the misadventures of those who chased the splendid swallow-tail butterflies across the broken and treacherous fens. He used to pause every now and then and lecture on some plant or other object; and something he could tell us on every insect, shell, or fossil collected, for he had attended to every branch of natural history. After our day's work we used to dine at some inn or house, and most jovial we then were. I believe all who joined these excursions will agree with me that they have left an enduring impression of delight on our minds. As time passed on at Cambridge I became very intimate with Professor Henslow, and his kindness was unbounded; he continually asked me to his house, and allowed me to accompany him in his walks. He talked on all subjects, including his deep sense of religion, and was entirely open. I owe more than I can express to this excellent man. His kindness was steady; when Captain Fitzroy offered to give up part of his own cabin to any naturalist who would

join the expedition in H. M. S. Beagle, Professor Henslow recommended me, as one who knew very little, but who, he thought, would work. I was strongly attached to natural history, and this attachment I owed, in large part, to him. During the five years' voyage, he regularly corresponded with me and guided my efforts; he received, opened, and took care of all the specimens sent home in many large boxes; but I firmly believe that, during these five years, it never once crossed his mind that he was acting towards me with unusual and generous kindness. During the years when I associated so much with Professor Henslow, I never once saw his temper even ruffled. He never took an ill-natured view of anyone's character, though very far from blind to the foibles of others. It always struck me that his mind could not be even touched by any paltry feeling of vanity, envy, or jealousy. With all this equability of temper and remarkable benevolence, there was no insipidity of character. A man must have been blind not to have perceived that beneath this placid exterior there was a vigorous and determined will. When principle came into play, no power on earth could have turned him one hair's breadth. . . . In intellect, as far as I could judge, accurate powers of observation, sound sense, and cautious judgment seemed predominant. Nothing seemed to give him so much enjoyment as drawing conclusions from minute observations. But his admirable memoir on the geology of Anglesey shows his capacity for extended observations and broad views. Reflecting over his character with gratitude and reverence, his moral attributes rise, as they should do, in the highest character, in pre-eminence over his intellect.

Darwin was as apt to learn the lesson of modesty and sincerity, kindness and magnanimity, as anything that Professor Henslow could teach him, and with perfect truth we can now apply to the admiring and grateful pupil the words which he wrote of his friend and teacher at Cambridge.

Mr. Darwin spent between three and four years at Cambridge, where he met with Sedgwick, Airy, Ramsay, and other men of science; and it was in 1831 that he accepted the offer mentioned above, to accompany Captain Fitzroy in H. M. S. Beagle, which was commissioned to complete the survey of Patagonia and Tierra del Fuego, begun by Captain King, to survey the shores of Chile, Peru, and some

islands of the Pacific, and to carry a chain of chronometrical measurements round the world. We have given Mr. Darwin's account of how he came to join the expedition. Captain Fitzroy, in his description of the voyage, published in 1839, says that, at his suggestion, the hydrographer of the Admiralty, Captain Beaufort, consented to the appointment "of some scientific person" to collect useful information during the voyage, and "wrote to Professor Peacock of Cambridge, who consulted with a friend, Professor Henslow, and he named Mr. Charles Darwin, grandson of the poet, as a young man of promising ability, extremely fond of geology, and indeed all branches of natural history. In consequence, an offer was made to Mr. Darwin to be my guest on board, which he accepted conditionally; permission was obtained for his embarkation, and an order given by the Admiralty that he should be borne on the ship's books for provisions. The conditions asked by Mr. Darwin were, that he should be at liberty to leave the *Beagle* and retire from the expedition when he thought proper, and that he should pay a fair share of the expenses of my table."¹ Captain Fitzroy, in proposing the appointment of a scientific man, and Professor Henslow, in fixing upon Darwin for the post, did good service to the world, for, during the voyage of the *Beagle* seeds were sown in Darwin's fertile mind which bore fruit in his greatest works, and indeed in nearly all the work of his life. He told us long afterwards how the facts learnt in South America, after being pondered for many years, led to the publication of the *Origin of Species* in 1859.

When on board *H. M. S. Beagle*, as naturalist, I was much struck with certain facts in the distribution of the organic beings inhabiting South America, and in the geological relations of the present to the past inhabitants of that continent. These facts seemed to throw some light on the origin of species—that mystery of mysteries, as it has been called by one

¹ *A Narrative of the Surveying Voyages of H. M. S. Adventure and Beagle*, Vol. II., pp. 18, 19.

of our greatest philosophers. On my return home it occurred to me, in 1837, that something might perhaps be made out on this question by patiently accumulating and reflecting on all sorts of facts which could possibly have any bearing on it. After five years' work I allowed myself to speculate on the subject, and drew up some short notes; these I enlarged in 1844 into a sketch of the conclusions which then seemed to me probable; from that period to the present day I have steadily pursued the same object.¹

From these words we learn a good deal of Darwin's method of work; his patience, his industry, his conscientiousness. It was more than twenty years before he allowed himself to give to the world the results of the studies which he resolved upon in 1837; and even then it was by the persuasion of friends that he published what he calls "this abstract" of his researches and conclusions.

The memorable voyage of the *Beagle*, which will always be associated with the dawn of a new scientific epoch, began on the 27th of December, 1831, and lasted for nearly five years, ending on the 2nd of October, 1836. Mr. Darwin has told the story of his adventures and experiences in the *Journal of Researches*, a book which is now familiarly known as "A Naturalist's Voyage Round the World."² It was published in 1839, the first of a succession of works which for forty years surprised and charmed the scientific world; and before the second edition appeared in 1845 the book had been translated into German, the Germans having thus early shown their appreciation of Mr. Darwin's genius. It is impossible to give even an

¹ Introduction to the *Origin of Species*, 1859.

² In 1839 Mr. Colburn published an account of the Voyages of the *Beagle* and the *Adventure* (which had previously been engaged on a similar survey), in two volumes, by Captain King and Captain Fitzroy; and, as a third volume, but complete in itself and sold separately, "*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." A second edition of the *Journal of Researches* appeared in 1845.

outline of the voyage, but, for the purpose of this paper, which is to produce something like a picture of the man, and not a scientific estimate of his work, nothing can be better than a liberal use of the *Journal of Researches*, where he marshals facts with the same masterly hand that compels our admiration in his maturer writings, while we come across one passage after another showing his great powers of mind, and his noble and kindly nature.

Soon after Mr. Darwin arrived at Rio de Janeiro he accepted the invitation of an Englishman to visit his estate, a hundred miles from the capital. If we could give the complete account of this expedition, it would exemplify in a striking way Mr. Darwin's remarkable habits of observation, the sympathy with his fellow-creatures, however lowly they might be, and the delight in nature, which characterize the whole book.

As it was growing dark (he says, of the evening of the first day) we passed under one of the massive, bare, and steep hills of granite, which are so common in this country. This spot is notorious from having been, for a long time, the residence of some run-away slaves, who, by cultivating a little ground near the top, contrived to eke out a subsistence. At length they were discovered, and a party of soldiers being sent, the whole were seized with the exception of one old woman, who, sooner than again be led into slavery, dashed herself to pieces from the summit of the mountain. In a Roman matron this would have been called the noble love of freedom; in a poor negress it is mere brutal obstinacy. We continued riding for some hours. For the few last miles the road was intricate, and it passed through a desert waste of marshes and lagoons. The scene by the dimmed light of the moon was most desolate. A few fireflies flittered by us; and the solitary snipe, as it rose, uttered its plaintive cry. The distant and sullen roar of the sea scarcely broke the stillness of the night.

The journey was not without its hardships, though they were willingly borne for the sake of the fresh experience and knowledge which it brought. At the *vênda* (or inn), the travellers would ask the *senhôr* to do them the favour of giving them something to eat. "Anything you choose, sir," was his usual answer.

For the first few times, vainly I thanked providence for having guided us to so good a man. The conversation proceeding, the case universally became deplorable. 'Any fish can you do us the favour of giving?'—'Oh! no, Sir.'—'Any soup?'—'No, Sir.'—'Any bread?'—'Oh! no, Sir.'—'Any dried meat?'—'Oh, no, Sir.' If we were lucky, by waiting a couple of hours we obtained fowls, rice, and *farinha*." The hosts were ungracious and disagreeable in their manners; the houses filthy; in many places, forks, knives, and spoons, were unknown. At the end of the third day, the troubles of the adventurers assumed a different shape. They reached the house of a friend, where the dishes were many, and every guest was expected to eat of each; and Mr. Darwin describes how, one day, having nicely calculated, as he thought, so that nothing should go away untasted, to his utter dismay "a roast turkey and a pig appeared in all their substantial reality." But the life here was pleasant and even fascinating in its patriarchal simplicity, "as long as the idea of slavery could be banished;" and on this estate the slaves seemed to be happy enough. "One morning I walked out an hour before daylight to admire the solemn stillness of the scene; at last the silence was broken by the morning hymn, raised on high by the whole body of the blacks; and in this manner their daily work is generally begun."

On the estate where he stopped next Mr. Darwin "was very nearly being an eye-witness to one of those atrocious acts which can only take place in a slave country." The owner, though a man of more than average humanity and kind feeling, was about to sell all the women and children away from the men, and was only prevented by self-interest. In connection with this incident, Mr. Darwin "mentions one very trifling anecdote which at the time struck him more forcibly than any story of cruelty." He was crossing a ferry with an uncommonly stupid negro. "In endeavouring to make him understand, I talked loud, and made

signs, in doing which I passed my hand near his face. He, I suppose, thought I was in a passion, and was going to strike him, for instantly, with frightened look and half-shut eyes, he dropped his hands. I shall never forget my feelings of surprise, disgust, and shame, at seeing a great, powerful man afraid even to ward off a blow directed, as he thought, at his face. This man had been trained to a degradation lower than the slavery of the most helpless animals." His feelings were always strong on the subject of slavery. Towards the close of the *Journal*, describing his last departure from Brazil, he writes—"I thank God that I shall never again visit a slave country. To this day, if I hear a distant scream, it recalls with painful vividness my feelings when, passing a house near Pernambuco, I heard the most pitiable moans, and could not but suspect that some poor slave was being tortured, yet knew that I was as powerless as a child even to remonstrate"; and he adds, "it makes one's blood boil, yet heart tremble," to think what Englishmen and Americans have been guilty of in this matter.

In contrast to the dark picture of human cruelty, we have Mr. Darwin's description of the beauty of nature in the forest, as he saw it during the excursion from Rio. The palm trees, growing among the common branching kinds, gave the scene an intertropical character. "The woods were ornamented by the Cabbage Palm—one of the most beautiful of its family. With a stem so narrow that it might be clasped with the two hands, it waves its elegant head at the height of forty or fifty feet from the ground. . . . If the eye was turned from the world of foliage above to the ground beneath, it was attracted by the extreme elegance of the leaves of the ferns and mimosæ. The latter in some parts covered the surface with a brushwood only a few inches high. In walking across these thick beds of mimosæ, a broad track was marked by the change of shade produced by the drooping of their sensitive petioles. It is easy to

specify the individual objects of admiration in these grand scenes; but it is not possible to give an adequate idea of the higher feelings of wonder, astonishment, and devotion, which fill and elevate the mind."

Nearly four years were passed in coasting round South America, but Mr. Darwin spent much of his time in journeying inland; and almost every day seems to have brought fresh stores of knowledge for future use, and fresh occasion to scrutinize very closely the scientific theories of the time. The discovery of the remains of gigantic quadrupeds at Bahia Blanca leads him to examine the assumption that large animals require luxuriant vegetation, and, with abundant proof, he declares it to be false. Side by side with this, we may place the curious and instructive facts mentioned by Mr. Darwin in connection with a remarkable drought in Buenos Ayres and St. Fé between 1827 and 1830. So great was the drought that in some parts cattle, which abounded before, completely perished, and meat had to be imported to feed the inhabitants. The animals rushed in hundreds of thousands into the rivers, and, weakened by hunger, were drowned. "What would be the opinion of a geologist, viewing such an enormous collection of bones, of all kinds of animals, and of all ages, embedded in one thick, earthy mass? Would he not attribute it to a flood having swept over the surface of the land, rather than to the common order of things?" Again, in Banda Oriental, oxen of a very curious breed are found, with lips which do not join. The consequence of this peculiarity is that, during a drought, the niata cattle, as they are called, cannot easily browse on the twigs of trees, and reeds, and hence they perish before the common breed; "which affords a good illustration of our inability to judge, from the ordinary habits of life, by what circumstances the rarity or extinction of a species may be determined." And in another place the similarity of the extinct to the living animals calls forth this pregnant remark—"The wonderful relationship in the

same continent between the dead and the living will, I do not doubt, hereafter throw more light on the appearance of organic beings on the earth, and their disappearance from it, than any other class of facts." We have here the germ of "the great law of the long-enduring, but not immutable, succession of the same types within the same areas," which is set forth in the *Origin of Species*.

When the *Beagle* reached Tierra del Fuego, and the natives advanced to the shore, Mr. Darwin saw, "without exception, the most curious and interesting spectacle" he ever beheld. "I could not have believed," he says, "how wide was the difference between savage and civilized man; it is greater than between a wild and domesticated animal, inasmuch as in man there is greater power of improvement." In Tierra del Fuego Mr. Darwin had many opportunities of studying man in his most uncivilized condition; beings of whom he says, "one can hardly make oneself believe that they are fellow creatures and inhabitants of the same world"; and he gives us an interesting account of what seems to Europeans their unutterably wretched life, but comes to the conclusion that, as there is no reason to believe they decrease in number, "we must suppose they enjoy a sufficient share of happiness to make life worth having." Their language scarcely deserved to be called articulate; in winter, when pressed by hunger, they killed and devoured their old women before they killed their dogs; they were almost like the wild beasts in their apparent incapacity to reason on some simple subjects.

Within the last few years, a Christian Church has been established amongst the Fuegians, with its schools and orphanage, and all the machinery of an English parish, and the change is wonderful. The natives live in cottages, cultivate their gardens, and follow the various occupations of civilized life; and part of the Scriptures is translated into their barbarous tongue. When Mr. Darwin heard what had taken place he was amazed,

and writing to Admiral Sullivan (who accompanied Captain Fitzroy in the *Beagle*), he said—"I had always thought the civilization of the Japanese the most wonderful thing in history, but I am now convinced that what the missionaries have done in Tierra del Fuego, in civilizing the natives, is at least as wonderful." Not content with expressing his admiration, Mr. Darwin sent a donation to the South American Missionary Society by which the work was accomplished; and amongst the tributes paid to his memory when he died was a paragraph in the Society's annual report, recording that his death had been "the cause of deep regret throughout the world," and paying "a sincere tribute of respect to the memory of a man of unblemished character, of the highest intellectual capacity, and of rare attainments." The incident is honourable both to Mr. Darwin and to the Society which recognized his worth.

From Tierra del Fuego the *Beagle* passed into the Pacific, and cruised slowly up the western coast of South America, when Mr. Darwin felt the shock of a great earthquake and examined its effects in connection with volcanic action; and in September, 1835, the voyagers reached the Galapagos Archipelago, in some respects the most interesting to a naturalist of all the countries which they visited. The Archipelago is a group of islands formed of volcanic rocks, containing probably two thousand craters; but the chief peculiarity of the group lies in the novelty of the flora and the fauna, which differ even on the various islands.

It was most striking to be surrounded by new birds, new reptiles, new shells, new insects, new plants, and yet by innumerable trifling details of structure, and, even by the tones of voice and plumage of the birds, to have the temperate plains of Patagonia, or the hot dry deserts of Northern Chile, vividly brought before my eyes. Why, on these small points of land, which within a late geological period must have been covered by the ocean, which are formed of basaltic lava, and therefore differ in geological character from the American continent, and which are placed under a peculiar climate,—

why were their aboriginal inhabitants, associated, I may add in different proportions both in kind and number from those on the continent, and therefore acting on each other in a different manner—why were they created on American types of organization? It is probable that the islands of the Cape de Verd group resemble, in all their physical conditions, far more closely the Galapagos Islands than these latter physically resemble the coast of America; yet the aboriginal inhabitants of the two groups are totally unlike; those of the Cape de Verd Islands bearing the impress of Africa, as the inhabitants of the Galapagos Archipelago are stamped with that of America.

The facts which he observed in the Galapagos Archipelago furnished Mr. Darwin with valuable material for his remarks in the *Origin of Species* on “the relations of the inhabitants of islands to those of the nearest mainland.”

In the Galapagos Islands, which have not long been regularly inhabited by man, Mr. Darwin was struck by the curious tameness of the birds. He pushed a hawk from the branch of a tree with the muzzle of his gun; a mocking-thrush alighted on a pitcher in his hand, and sipped out of it; and he saw a boy standing by a well, with a switch, killing for his dinner a number of doves and finches which came to drink. After giving examples of similar tameness in other parts of the world little frequented by man, Mr. Darwin says—“In regard to the wildness of birds towards man, there is no way of accounting for it, except as an inherited habit. Comparatively few young birds, in any one year, have been injured by man in England, yet almost all, even nestlings, are afraid of him; many individuals, on the other hand, both at Galapagos and at the Falklands, have been pursued and injured by man, but yet have not learned a salutary dread of him. We may infer from these facts, what havoc the introduction of any new beast of prey must cause in a country, before the instincts of the indigenous inhabitants have become adapted to the stranger’s craft or power.”

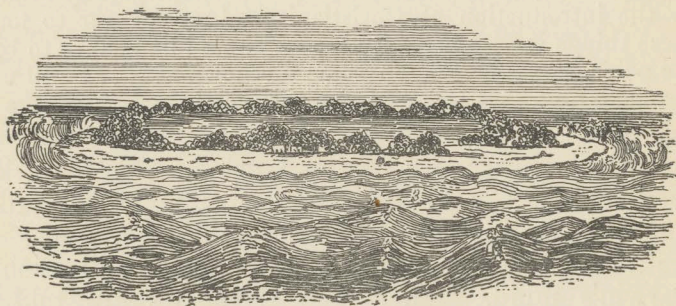
From the Galapagos Archipelago the vessel steered for Tahiti. In that island Mr. Darwin saw a good deal of the missionaries, and his remarks upon their work are worth quoting, because they show with what an observant and impartial mind, far removed above the ordinary prejudices of the traveller, he regarded his fellow men.

On the whole, it appears to me that the morality and religion of the inhabitants are highly creditable. There are many who attack, even more acrimoniously than Kotzebue, the missionaries, their system, and the effects produced by it. Such reasoners never compare the present state with that of the island only twenty years ago; nor even with that of Europe at this day; but they compare it with the high standard of Gospel perfection. They expect the missionaries to effect that which the Apostles themselves failed to do. Inasmuch as the condition of the people falls short of this high standard, blame is attached to the missionary, instead of credit for that which he has effected. They forget, or will not remember, that human sacrifices, and the power of an idolatrous priesthood—a system of profligacy unparalleled in any other part of the world—infanticide a consequence of that system—bloody wars, where the conquerors spared neither women nor children—that all these have been abolished; and that dishonesty, intemperance, and licentiousness, have been greatly reduced by the introduction of Christianity. In a voyager to forget these things is base ingratitude; for should he chance to be at the point of shipwreck on some unknown coast, he will most devoutly pray that the lesson of the missionary may have extended thus far.

A curious illustration of the truth of this remark is supplied by the experience of a number of sailors amongst the natives of Tierra del Fuego, whose degraded condition had made so deep an impression on Darwin’s mind. In former days, we are told by Admiral Sullivan, no shipwrecked crew ever escaped from that inhospitable shore with their lives, except by force of arms. Some time after the Mission was established, a Liverpool barque and a schooner were driven upon the coast, a few miles from the site of a stockade built by a number of sailors, years before, to defend themselves against the natives. In the present

case, the castaways were treated by the Fuegians with the greatest kindness, and guided many hundreds of miles to a spot where passing vessels might be signalled.

New Zealand and Australia were visited next, and then the Keeling Islands in the Indian Ocean, where Mr. Darwin examined the coral formation, and discovered the secret of the curious lagoon-islands, or atolls, which had excited the wonder and admiration of every traveller who saw them. He devotes several pages to a lucid description of these marvellous structures, and it was afterwards enlarged into the well-known work on the *Structure and Distribution of Coral Reefs*. Thousands of voyagers had seen these atolls, and many had tried to explain their construction; but the secret was kept until Mr. Darwin revealed it. His explanation is as simple as it is ingenious. The oceanic islands, round which the corals build their reefs, gradually subside. As they sink the coral-reefs are built higher and higher, until, when the original island disappears, what we may call a lake in the midst of the ocean remains, such as is represented in the accompanying sketch. We can only sum up in a few words the



conclusion that was reached, but it is supported by an array of facts and arguments which leave no room for doubt, and, as we shall see further on, it commended itself at once as true to men of science in every country. Some of the atolls are forty or fifty miles across, and Mr. Darwin says "the immensity of the

ocean, the fury of the breakers, contrasted with the lowness of the land, and the bright green water within the lagoon, can hardly be imagined without having been seen."

Brazil was reached again, by way of the Mauritius, the Cape, and St. Helena, to complete the circuit of the globe, and then the Beagle returned home. The effect of a long voyage, says Mr. Darwin, "ought to be to teach the traveller good-humoured patience, freedom from selfishness, the habit of acting for himself, and of making the best of every occurrence." The writer had ample opportunity of putting his philosophy to the test! He suffered much from sea-sickness; so much, indeed, that it is supposed to have affected him for the rest of his life; though, with characteristic self-forgetfulness, he makes only a passing reference to it. But he speaks of the deep enjoyment he derived; nor is this wonderful when we know the spirit in which the voyage was undertaken, and the interest in other men and other things that made his own sufferings a mere trifle in the balance.

The Beagle brought home an abundant crop of literature. The firstfruits were given to the world in an account of the *Zoology of the Voyage*, and while this was appearing in parts, the volumes by Captain Fitzroy and Mr. Darwin, already mentioned, were published. The *Journal of Researches* was received with great favour. The *Quarterly Review* described it as "one of the most interesting narratives of voyaging that it has fallen to our lot to take up, and one which must always occupy a distinguished space in the history of scientific navigation"; and the President of the Geological Society said that "looking at the general mass of Mr. Darwin's results he could not help considering the voyage as one of the most important events for geology which had occurred for many years."

The *Zoology of the Voyage*, which was published with the aid of a grant of £1000 from the national Exchequer, included an account of the Fossil Mammalia by Pro-

fessor Owen, the Living Mammalia by Mr. Waterhouse, the Birds by Mr. Gould, the Fish by the Rev. L. Jenyns, and the Reptiles by Mr. Bell. It was through Mr. Darwin's labours in collecting specimens and making observations that all these works were produced, and he added to the description of each species an account of its habits and range. The Insects which he collected were the subject of papers by Mr. Waterhouse and others; the Plants from South America were described by Dr. Hooker, who also wrote a memoir for the Linnæan Society on the Flora of the Galapagos Archipelago; Professor Henslow published a list of Plants from the Keeling Islands, and the Cryptogamic Plants were described by Mr. Berkeley. When we add to these the works from Mr. Darwin's own hand, we can form some notion of the "capacity for taking pains" which distinguished the young naturalist.

Several short papers founded upon observations made during the voyage appeared within a few years of his return, and some of them were embodied in the larger works afterwards published. One, on the habits of the South American Ostrich, was read at a meeting of the Zoological Society in March, 1839, when Mr. Gould described the *Rhea Darwinii*, so called in honour of its discoverer, and spoke of Mr. Darwin's important contributions to science; two others, on the Planarian Worms of South America and on *Sagitta* and its Development, appeared in 1844; but most of Mr. Darwin's attention was directed at this time to geology. In May, 1837, he communicated to the Geological Society his views on Coral Reefs which were afterwards published in the volume mentioned further on;¹ and he contributed two papers to the same society, on the Volcanic Phenomena and the Erratic Boulders of South America. In a

¹ "I am very full of Darwin's new theory of Coral Islands, and have urged Whewell to make him read it at our next meeting. I must give up my volcanic crater theory for ever, though it ceets me a pang at first."—*Lyell to Sir John Herschell*, May 24, 1837.

letter dated December, 1836, only a few weeks after the *Beagle* returned, Lyell, writing to tell Darwin of the great pleasure which he had derived from a paper of his, and offering to go through it with him before it was read in public, says—"The idea of the Pampas going up at the rate of an inch in a century, while the western coast and the Andes rise many feet, and unequally, has long been a dream of mine. What a splendid field you have to write upon." In another letter, in March, 1838, Lyell returns to the subject, and gives an account of the meeting of the Geological Society at which Darwin read his paper on the Connection of Volcanic Phenomena and the Elevation of Mountain Chains. "He opened upon De la Bêche, Phillips, and others his whole battery of the earthquakes and volcanoes of the Andes, and argued that spaces of a thousand miles long were simultaneously subject to earthquakes and volcanic eruptions, and that the elevation of the Pampas, Patagonia, &c., all depended on a common cause." So early had Mr. Darwin, then a young man of twenty-nine, taken his place among the leading geologists of his time.

In 1842 the first of three volumes by Mr. Darwin on the Geology of the *Beagle* was published under the title of the *Structure and Distribution of Coral Reefs*; in 1844 appeared *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"; and in 1846 the work was completed by "*Geological Observations on South America*." Each of these volumes was enough to make a considerable reputation for the writer, but the first was the most important. So close was Mr. Darwin's observation, and so cogent was his reasoning, that in four or five years the theory which he set forth was "in progress of adoption by men of science in every country."¹ "This theory (says

¹ *Quarterly Review*, LXXXI. (1847), p. 492.

the Director General of the Geological Survey¹) for simplicity and grandeur strikes every reader with astonishment. It is pleasant after the lapse of many years to recall the delight with which one first read the *Coral Reefs*, how one watched the facts being marshalled into their places, nothing being ignored or passed lightly over, and how step by step one was led up to the grand conclusion of wide oceanic subsidences. No more admirable example of scientific method was ever given to the world, and even if he had written nothing else, this treatise alone would have placed Darwin in the very front of investigators of nature." We have mentioned the direct results of the voyage of the *Beagle*; the indirect results can neither be mentioned nor measured. They are to be seen, as we have said, in almost every work which Mr. Darwin wrote; and the sum of them is a revolution in scientific belief. For this reason it has seemed well to occupy so much of this paper with the early years of Mr. Darwin as a student and a discoverer.

Mr. Darwin, as we have seen, had not been long at home before his valuable services were recognized by men of science, and he was soon elected a Fellow of the Royal Society. In the letter from which we have already quoted, Lyell advises him to accept no official appointment if he can avoid it; but not long afterwards we find him Secretary to the Geological Society, an office which he filled when the *Journal of Researches* was published in 1839. Two years later he retired, and it was fortunate for the world that thenceforth he acted upon Lyell's advice, and "worked exclusively for science." It was before the Geological Society, on the 1st of November, 1837, that Mr. Darwin read a short paper on the "Formation of Mould"; and forty four years passed before he gave to the public the mature results of his investigations, in the interesting

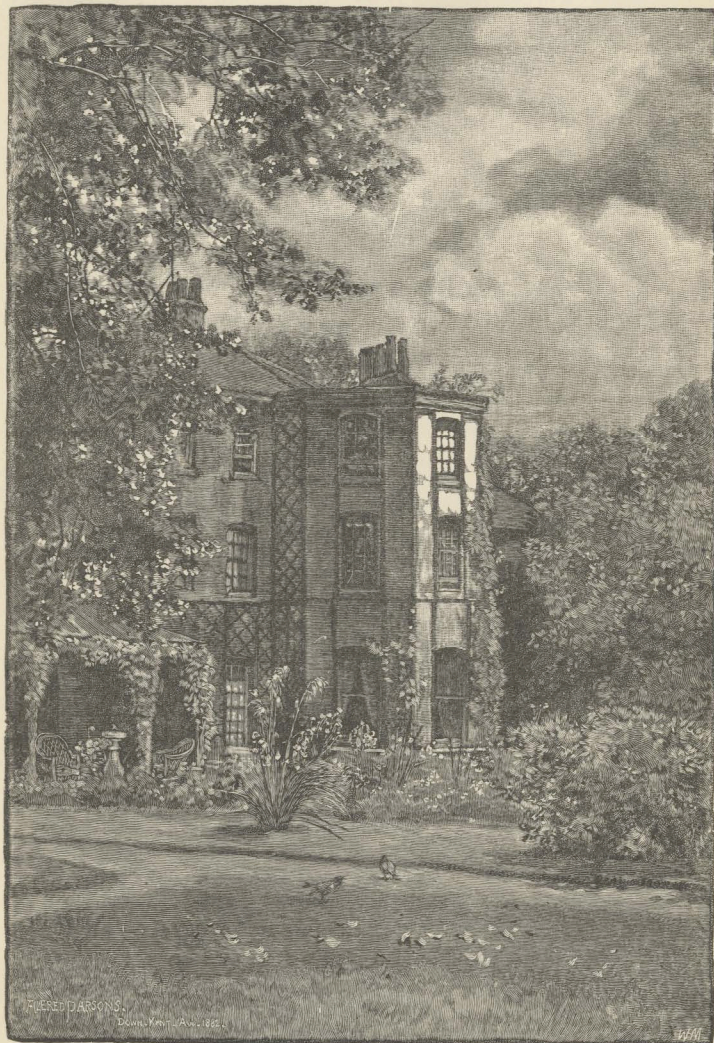
¹ Paper in *Nature* on "Mr. Darwin's work in Geology" by Archibald Geikie, LL.D., F.R.S., 1882.

book on the same subject published not many months before he died.

His uncle, Mr. Josiah Wedgwood of Maer Hall in Staffordshire, had suggested to him that the apparent sinking of superficial bodies was due to the action of earth-worms; and this suggestion started Mr. Darwin on the line of enquiry and experiment described in the latest work of his life. For the purposes of that enquiry a quantity of broken chalk was spread over part of a field at Down, in December, 1842, and after an interval of twenty nine years, at the end of November, 1871, a trench was dug to test the results. The book on *Earth Worms* will be mentioned again in order of date; but it is worth while recording here a fact which gives so vivid an illustration of Mr. Darwin's patient devotion to scientific truth. He seemed never to take a step forward until his footing was perfectly secure; and that is the reason, probably, why his writings have made so profound an impression and so quickly won the assent of his contemporaries.

In the early part of 1839 Mr. Darwin married his cousin, Miss Emma Wedgwood, daughter of Mr. Josiah Wedgwood of Maer Hall, and after a short residence in London he settled in 1842 at Down House,¹ near Down, in Kent, for the rest of his days. Down is a quiet little village near the borders of Surrey, three or four miles from the Orpington Station on the South Eastern Railway, between London and Hastings. There, on the pleasant Kentish hills, in the seclusion which was necessary for his work, but near the metropolis, he spent his fruitful days; and, except the record of his published works, there is little to tell of the forty years passed in this quiet retreat. Happy in his home, with children growing up about him, with

For the engraving of Down House, and the Greenhouse (given further on), we are indebted to the publishers of *The Century*, in which they appeared (Vol. XXV., No. 3), to illustrate an interesting paper by Mr. Wallace.



DOWN HOUSE.

(Where Darwin lived for forty years).

means sufficient to live the life of an English country gentleman, and endowed "with a sweet and gentle nature which blossomed into perfection" (as a writer in the *Saturday Review* said at the time of his death), no better lot could be desired for the student of nature, except that it was marred for years by continued ill-health. The days were many on which he could not work at all, and on many others two or three hours was the compulsory limit of his task; so that the mere bulk of his writings, considering their supreme quality, and the enormous labour of preparing the material, is a lasting tribute to his genius.

Of course, to accomplish all this, he worked systematically. "In preparing his books he had a special set of shelves for each, standing on or near his writing-table, a shelf being devoted to the material destined to form each chapter"; and his days, as far as the state of his health would permit, were carefully parcelled out between work and recreation, to make the best of his time. Retiring to bed at ten, he was an early riser, and often in his library at eight, after breakfast and his first morning walk. Later in the day he generally walked again, often in his own grounds, but sometimes further afield, and then generally by quiet footpaths rather than frequented roads. The walks at one time were varied by rides along the lanes on a favourite black cob; but, some years before Mr. Darwin's death, his four-footed friend fell, and died by the roadside, and from that day the habit of riding was given up. Part of the evening was devoted to his family and his friends, who delighted to gather round him, to enjoy the charm of his bright intelligence and his unrivalled stores of knowledge. To Down, occasionally, came distinguished men from many lands; and there in later years would sometimes be found the younger generation of scientific students, looking up to the great Naturalist with the reverence of disciples, who had experienced his singular modesty, his patient readiness to listen to all opinions, and the winning grace with which he

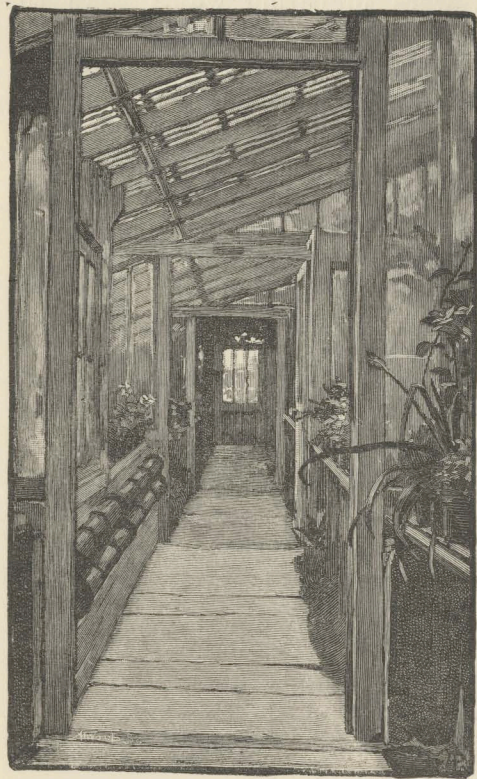
informed their ignorance and corrected their mistakes. At other times, there was novel-reading, perhaps by Mrs. Darwin; and so the quiet days followed one another, while works were preparing which were to astonish the civilised world.

In the midst of all the delights of home and the demands of study, Mr. Darwin kept an open mind for public affairs. He united the earnest politician with the patient student: a rare combination, which supplies another proof of his largeness of heart and sympathy with his fellow men. In the village of Down he was liked by everybody, old and young; and in his own household the same servants lived year after year under his roof. One of them, Margaret Evans, who assisted in nursing him in his last illness, had come to Down, nearly forty years before, from Shrewsbury, where her uncle and aunt were in Dr. Darwin's service.

The story of Mr. Darwin's life must be read chiefly in his writings. Down House will always be associated with the pigeons of which we read so much in some of his books; with that most unexpected of all guests, the earthworm; with his keen and amusing observations of the habits of his own infants. Such was the simplicity of the man, that all his experiments seem to have been conducted with a singular absence of ostentation. The botanist, Alphonse de Candolle, whose observations are often quoted in the *Origin of Species*, says:—

It was on a beautiful autumn morning, in 1880, that I arrived at the Orpington Station, where my illustrious friend had a break waiting for me. The drive to Down takes an hour; it presents nothing remarkable, unless it be the residence, surrounded by beautiful trees, of Sir John Lubbock. I will not here speak of the kind reception that was given me at Down, nor of the pleasure which I felt in chatting familiarly with Mr. and Mrs. Darwin, and their son Francis. I will only remark that Darwin at seventy was more animated and seemed happier than when I had seen him forty-one years before. His eye was bright, and his expression cheerful, his conversation varied, free and pleasing, his English easy for a foreigner to understand. Around the house there were no signs of his

researches. Darwin used simple means. I looked for the greenhouse, in which those beautiful researches on vegetable hybrids had been made it contained nothing but a vine.



THE GREENHOUSE AT DOWN.

(In which Mr. Darwin made experiments.)

causes often repeated. He had been busy with them for thirty years, had I known it. On our return to the house, Darwin showed me his study—a large room, lighted on both sides, with one table for writing and another for experimental apparatus. An experiment on the movements of stems and roots was then in progress. I should have liked to see the registers of experiments, but the hours slipped away like minutes.¹

¹ I have taken this from a condensed translation of the original given in a lecture by Professor L. C. Miall, before the Leeds Philosophical Society, February, 1883.

The quiet life at Down was varied occasionally by journeys in England and Wales, but Mr. Darwin never travelled much after his long voyage in the *Beagle*. He visited Snowdonia, attracted there by Buckland's account of ice-action, and the result appeared in a paper of great value (1843) on British Glaciers. Years after, we believe, he delivered a lecture before the members of the Literary Institute at Tenby, where some of Mrs. Darwin's relations were then living; but he was little seen in public at any time, though his face became familiar by means of portraits long before he died.¹ In 1847 Mr. Darwin was one of the speakers at the Oxford meeting of the British Association, where Robert Chambers, even then mentioned by Lyell as "the author of the *Vestiges*," read a paper, and Ruskin officiated as Secretary of the Geological Section. It was thirteen years after when the British Association, again at Oxford, discussed with much vehemence the *Origin of Species*, of which, in 1847, Mr. Darwin had already sketched the outline. The preparation of that book, minute and elaborate as it was, still left time for other laborious work, of which his great monograph on the *Cirripedia*, published by the Ray Society in two volumes, in 1851 and 1854, was the most remarkable example. It established his fame as a zoologist, and he drew from his observations of the structure and habits of the remarkable family of Barnacles conclusions of the greatest value to comparative anatomists.

In 1853 Mr. Darwin received the medal of the Royal Society; and it happened to be a year of considerable interest in connection with the work of his life. The theory which he was to establish seemed to be "in the air." In 1852 Mr. Herbert Spencer had written an essay in the *Leader*, arguing that species were modified

¹ The portrait of Mr. Darwin which is given with this paper is reproduced by the Woodbury process from a photograph taken by Captain Darwin, for which I have to thank Mr. Francis Darwin, whose kindness in supplying me with particulars of his father's boyhood I also take this opportunity of acknowledging.

by circumstances; in 1853 appeared the tenth and much improved edition of the *Vestiges*, of which Mr. Darwin says—"It has done excellent service in this country in calling attention to the subject, in removing prejudice, and in thus preparing the ground for the reception of analogous views." In the same year Count Keyserling and Dr. Schaaffhausen, in different countries, argued in favour of the modification of species; and similar views were propounded by other writers in 1854 and 1855.¹ How Mr. Darwin's attention was directed to the subject during the voyage of the *Beagle* has already been stated, but anything which throws light upon the history of his principal work is interesting, and the following extract from a letter to Haeckel, published in his *History of Creation*, will be welcome.

Having reflected much on the foregoing facts, it seemed to me probable that allied species were descended from a common ancestor. But during several years I could not conceive how each form could have been modified so as to become admirably adapted to its place in nature. I began, therefore, to study domesticated animals and cultivated plants, and after a time perceived that man's power of selecting and breeding from certain individuals was the most powerful of all means in the production of new races. Having attended to the habits of animals and their relations to the surrounding conditions, I was able to realize the severe struggle for existence to which all organisms are subjected; and my geological observations had allowed me to appreciate to a certain extent the duration of past geological periods. With my mind thus prepared I fortunately happened to read Malthus's *Essay on Population*; and the idea of natural selection through the struggle for existence at once occurred to me. Of all the subordinate points in the theory, the last which I understood was the cause of the tendency in the descendants from a common progenitor to diverge in character.²

In 1858 Mr. Wallace, who was studying the Natural History of the Malay Archipelago, sent a memoir to

¹ See "Historical Sketch" prefixed to the *Origin of Species*, and the Introduction to that work.

² Rewritten from the German text by Mr. Darwin for *The Doctrine of Descent and Darwinism* by Oscar Schmidt.

Mr. Darwin, from which it appeared that these distinguished observers had "arrived at almost exactly the same general conclusions on the Origin of Species." We quote Mr. Darwin's own words, and he adds—"Sir C. Lyell and Dr. Hooker, who both knew of my work, the latter having read my sketch of 1844, honoured me by thinking it advisable to publish, with Mr. Wallace's excellent memoir, some brief extracts from my manuscripts." Mr. Darwin's recognition of Mr. Wallace's claims found a worthy response in Mr. Wallace's expressions of veneration for the "lofty pre-eminence" of his friend; and the story of their generous rivalry is one of the brightest in the annals of science. When Mr. Darwin died Mr. Wallace wrote a tribute to his memory in which his own share in establishing the doctrine of evolution is ignored, and Mr. Darwin is pronounced to be far above other names in natural science, not only of our own but of all times.

However much our knowledge of nature may advance in the future (says Mr. Wallace), it will certainly be by following in the pathways he has made clear for us, and for long years to come the name of Darwin will stand for the typical example of what the student of nature ought to be. And if we glance back over the whole domain of science we shall find none to stand beside him as equals; for in him we find a patient observation and collection of facts, as in Tycho Brahe; the power of using those facts in the determination of laws, as in Kepler; combined with the inspirational genius of a Newton, through which he was enabled to grasp fundamental principles, and so apply them as to bring order out of chaos, and illuminate the world of life as Newton illuminated the material universe. Paraphrasing the eulogistic words of the poet, we may say with perhaps a greater approximation to truth—

Nature and nature's laws lay hid in night;
God said, 'Let Darwin be,' and all was light.¹

It was on the 1st of July, 1858, that the papers by Mr. Darwin and Mr. Wallace were read before the Linnæan Society; and the *Origin of Species*² was pub-

¹ From the paper in *The Century* already mentioned.

² The full title of the work is *The Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*.

lished on the 24th of November, 1859, a date never to be forgotten in the history of science. The first edition quickly disappeared, and within six weeks a second was in the hands of the public. The work was translated into almost every continental language, and when the sixth English edition was published in January, 1872, a fifth German edition was in course of preparation, there were four in France, three in Russia, and one in Italy, Holland, and Sweden, as well as three in America. Of vehement denunciation Mr. Darwin's theory came in for its full share. The *Quarterly Review* received it with mingled denunciation and derision. The reviewer was charmed indeed with Mr. Darwin's revelations of Nature's secrets. "We feel as we walk abroad with Mr. Darwin very much as the favoured object of the attention of the dervise must have felt when he had rubbed the ointment around his eye, and had it opened to see all the jewels, and diamonds, and emeralds, and topazes, and rubies, which were sparkling unregarded beneath the earth, hidden as yet from all eyes save those which the dervise had enlightened."¹ Such a confession as this might well have made the critic doubt whether he was as capable as the dervise of interpreting the secrets which he revealed; but to Mr. Darwin's doctrine no quarter is given. "Under such influences a man soon goes back to the marvelling stare of childhood at the centaurs and hippogriffs of fancy, or, if he is of a philosophic turn, he comes, like Oken, to write a scheme of creation under a 'sort of inspiration,' but it is the frenzied inspiration of the inhaler of mephitic gas. The whole world of nature is laid for such a man under a fantastic law of glamour, and he becomes capable of believing anything; and he is able with a continually growing neglect of all the facts around him, with equal confidence and equal delusion, to look back to any past and to look on to any future." It may be doubted whether a more ingenious perversion of truth was ever devised than that of charg-

¹ *Quarterly Review*, Vol. CVIII., p. 230.

ing Mr. Darwin with a "continually growing neglect of all the facts around him"! The *Edinburgh Review* was not so extravagant in its condemnation, but solemnly warned the members of the Royal Institution, who had listened to a favourable lecture from Professor Huxley on the subject, that such speculations "more truly paralleled the abuse of science to which a neighbouring nation, some seventy years since, owed its temporary degradation."

At the Oxford meeting of the British Association in 1860 the book was discussed in a very lively way, in the section of Zoology and Botany, over which Mr. Darwin's old friend, Professor Henslow, presided for the last time. "A large audience," says the writer of Henslow's Life, "was drawn together to hear it;" numbers could not get in; and "those who were present speak of the admirable tact and judgment with which he regulated the discussion, showing complete impartiality, allowing everyone fairly to state his opinions, but checking all irrelevant remarks, and trying to keep down as much as possible any acrimonious feelings that appeared to mix themselves up with the arguments of the contending parties." It was Huxley who bore the brunt of the attack, and being asked by one of the disputants whether he was related, on his grandfather's or his grandmother's side, to an ape, replied that if he had his choice of an ancestor, whether it should be an ape, or one who, having received a scholastic education, should use his logic to mislead an untutored public, he should not hesitate for a moment to prefer the ape. The debates lasted a considerable time, and before they were over, "young Lubbock and Joseph Hooker declared their adhesion to Darwin's theory," as Lyell, who was at Oxford, but not able to attend the meetings of this section, writes in a letter to Sir Charles Bunbury. In the same letter he says that the crowded assembly, where Darwin's opponents had been loudly cheered, was at last "quite turned the other way, especially by Hooker."

For awhile Mr. Darwin was the butt of the comic papers and the shallow wits of the age; a thousand pulpits thundered against him with all the force of intense conviction; one of the two great political leaders of the day declared himself "on the side of the angels," against the author of the *Origin of Species*. Even the Royal Society hesitated to give him its highest reward, the Copley medal, and he only received it in 1864. Happy in the possession of a serene and unselfish spirit, Darwin watched the controversy without sharing in it, except to profit by any useful criticism, and take advantage of any correction for a fresh edition of his work. It was not his own reputation he was careful of, but the interests of truth, and as far as these were served by controversy, Mr. Darwin was glad to have all the light that could be gathered from every quarter shed upon the enquiry in which he was engaged. In a few years the storm abated. Many of the most distinguished leaders of science threw in their lot with Mr. Darwin, including Dr. Hooker amongst botanists, as we have already seen, and Lyell amongst geologists, though he expressed a certain degree of reserve.¹ Herbert Spencer carried the battle into the field of psychology; while Professor Huxley, at the head of the biologists, acted, as he himself modestly says, "for some time in the capacity of under-nurse" to the new offspring of science. Gradually, in the periodical press, derision gave place to respect and admiration; and after a

¹ Lyell welcomed the book, however, with great cordiality. "I have just finished your volume (he says) and right glad I am that I did my best with Hooker to persuade you to publish it without waiting for a time which probably could never have arrived, though you lived to the age of a hundred, when you had prepared all your facts on which you ground so many grand generalizations. It is a splendid case of close reasoning and long-sustained arguments throughout so many pages, the condensation immense, too great, perhaps, for the uninitiated, but an effective and important preliminary statement which will admit, even before your detailed proofs appear, of some occasional useful explanations, such as your pigeons and cirripides, of which you make such excellent use."—*Life of Sir Charles Lyell*, Vol. II, p. 325.

decent interval of nine or ten years the *Quarterly Review* recanted, when an article by Mr. Wallace was admitted to its pages.¹ In April, 1880, Professor Huxley delivered an Evening Lecture at the Royal Institution, on the "Coming-of-age of the Origin of Species,"² in which he was able to say that "the foremost men of science in every country are either avowed champions of its leading doctrines, or at any rate abstain from opposing them;" and when the pulpits of England once more resounded with Mr. Darwin's name, it was to bear testimony to his noble character and his ardent pursuit of truth.

As Professor Huxley shows in the lecture already mentioned, successive discoveries have helped in a remarkable way to prove the soundness of Mr. Darwin's conclusions. In 1862 the archæopteryx was discovered, "an animal which in its feathers and the greater part of its organization is a veritable bird, while in other parts it is as distinctly reptilian." In 1875 toothed birds were found in the cretaceous formation in North America, completing the transitional forms between birds and reptiles; and as these pages are passing through the press we hear of a discovery at Oxford in another department of natural history which Mr. Darwin has examined and illuminated. The *Utricularia*, or bladderwort, growing in ditches, consumes, not only insects, but young fish!³ Investigation in embryology has shown that "the first beginnings of all the higher forms

¹ *Geological Time and the Origin of Species*.

² Published in *Science and Culture and Other Essays*, 1881.

³ "A very interesting scientific fact has been recently discovered by an enthusiastic Oxford Naturalist. It has been well known for many years that certain plants, some of which are found in England, are carnivorous, and that they catch small insects and crustaceans by means of leaves modified to act as traps, and are nourished by the juices of the animals so caught. Mr. Sims has observed that one of these, by name *Utricularia*, which he has found growing in the brook in Christ Church meadow, not only consumes crustacea and insects, but also devours newly hatched fish. This is the first time on record that a carnivorous plant has been found to attack a vertebrate animal.

of animal life are similar; the geological record has introduced to us a multitude of extinct animals, the existence of which was previously hardly suspected"; and "evidence of the gradation and mutation of the forms of life," which Mr. Darwin in 1859 acknowledged to be lacking, has been so far supplied, that "if the doctrine of evolution had not existed, palæontologists (says Mr. Huxley) must have invented it." The marvellous success of the *Origin of Species* depended in the main, of course, upon the conclusiveness of its reasoning; but something must be allowed for the charm of the narrative, and more particularly for the admirable spirit in which it is written. Much of it is as interesting as a novel, even to the unscientific reader, and if the experience of the present writer is shared by others, the impression produced by the candour and modesty shown throughout the work is one of profound admiration for the author.

The *Origin of Species* is so well known that we are spared the necessity of saying much about Mr. Darwin's greatest work, and perhaps the greatest work of the present century. A single extract will furnish a sample of the many interesting facts which give so great a charm to this masterpiece of scientific reasoning. The passage in which Mr. Darwin shews that the abundance of a certain kind of clover may depend upon the number of cats has been quoted so often, that we will select another, showing the extraordinary adaptation of the *Coryanthes* to the purpose of fertilization.

This orchid has part of its labellum or lower lip hollowed out into a great bucket, into which drops of almost pure water continually fall from two secreting horns which stand above it; and when the bucket is half full, the water overflows by a spout on one side. The basal part of the labellum stands over the

The *Utricularia*, commonly known as the bladder-wort, belongs to the natural order *Lentibulariaceæ*; it grows generally in very foul ditches, its leaves are divided into a number of finger-like processes, and at the bases of the leaves are found the curious little oblong bladders provided with tentacles. It is by means of these bladders that the young fish are caught and devoured."—*The Oxford Magazine*, May 28th, 1884.

bucket, and is itself hollowed out into a sort of chamber with two lateral entrances; within this chamber there are curious fleshy ridges. The most ingenious man, if he had not witnessed what takes place, could never have imagined what purpose all these parts serve. But Dr. Crüger saw crowds of large humble-bees visiting the gigantic flowers of this orchid, not in order to suck nectar, but to gnaw off the ridges within the chamber above the bucket; in doing this they frequently pushed each other into the bucket, and their wings being thus wetted they could not fly away, but were compelled to crawl out through the passage formed by the spout or overflow. Dr. Crüger saw a "continual procession" of bees thus crawling out of their involuntary bath. The passage is narrow, and is roofed over by the column, so that a bee, in forcing its way out, first rubs its back against the viscid stigma and then against the viscid glands of the pollen-masses. The pollen-masses are thus glued to the back of the bee which first happens to crawl out through the passage of a lately expanded flower, and are thus carried away. Dr. Crüger sent me a flower in spirits of wine, with a bee which he had killed before it had quite crawled out with a pollen-mass still fastened to its back. When the bee, thus provided, flies to another flower, or to the same flower a second time, and is pushed by its comrades into the bucket and then crawls out by the passage, the pollen-mass necessarily comes first into contact with the viscid stigma, and adheres to it, and the flower is fertilised. Now at last we see the full use of every part of the flower, of the water-secreting horns, of the bucket half full of water, which prevents the bees from flying away, and forces them to crawl out through the spout, and rub against the properly placed viscid pollen-masses and the viscid stigma.

Mr. Wallace, in the paper already quoted, remarks upon the living interest which Mr. Darwin has imparted to the study of nature. He has been "enabled to bring to light innumerable hidden adaptations, and to prove that the most insignificant parts of the meanest living beings have a use and a purpose, are worthy of our earnest study, and fitted to excite our highest and most intelligent admiration." Everyone who reads the *Origin of Species* will feel the truth of this observation, and of Mr. Darwin's concluding words—

It is interesting to contemplate a tangled bank, clothed with many plants of many kinds, with birds singing on the bushes

with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent upon each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by Reproduction; Variability from the indirect and direct action of the conditions of life, and from use and disuse: a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved.

So successful was the work that Mr. Darwin did not find it necessary to publish all the volumes of accumulated facts which he had intended to supply by way of evidence; but a series of books of great interest and value appeared at intervals up to the time of his death, most of them bearing upon the Doctrine of Evolution. The first was the well-known book on *Orchids*¹ issued in 1862, and during the next six years he contributed to the Linnæan Society a number of papers, collected in the volume mentioned further on, and published in 1877. It was while he was engaged upon this investigation that he wrote the letter to the Rev. W. A. Leighton which, through that gentleman's kindness, we are able to reproduce in facsimile. The *Movements and Habits of Climbing Plants*, in 1865, was followed

¹ *On the Various Contrivances by which Orchids are Fertilized by Insects.* Many of these contrivances are adapted in a marvellous way to their purpose, and the reader will share the interest which Mr. Darwin felt in writing the book. "The study of these wonderful and often beautiful productions (he says) with all their many adaptations, with parts capable of movement, and other parts endowed with something so like, though no doubt different from, sensibility, has been to me most interesting."

in 1868 by one of the most laborious of Mr. Darwin's works, the *Variation of Animals and Plants under Domestication*, for which it is scarcely too much to say that the whole world was ransacked for materials. Amongst the many names mentioned, we find that of Mr. Eyton of Eyton several times; the breeds of wild turkeys in the parks of Lord Powis and Lord Hill are referred to; and to illustrate the power of transmitting peculiarities in plants Mr. Darwin quotes from the Rev. W. A. Leighton's *Flora of Shropshire* an interesting fact concerning a prostrate yew. "A weeping or rather a prostrate yew (*Taxus baccata*) was found in a hedge in Shropshire; it was a male, but one branch bore female flowers, and produced berries; these, being sown, produced seventeen trees, all of which had exactly the same peculiar habit with the parent tree." Some parts of the book were completed in 1858, and its publication was delayed by continued ill-health, though, in its array of facts and arguments it bears no trace of any want of vigour.

The book (Mr. Thiselton Dyer says in *Nature*), "apart from its primary purpose produced a profound impression, especially on botanists. This was partly due to the undeniable force of the argument from analogy stated in a sentence in the introduction: 'Man may be said to have been trying an experiment on a gigantic scale; and it is an experiment which nature, during the long lapse of time, has incessantly tried.' . . . Like Molière's Monsieur Jourdain, who was delighted to find that he had been unwittingly talking prose all his life, horticulturists who had unconsciously moulded plants almost at their will at the impulse of taste or profit were at once amazed and charmed to find that they had been doing scientific work and helping to establish a great theory. The criticism of practical men, at once most tenacious and difficult to meet, was disarmed; these found themselves hoist with their own petard. Nor was this all. The exclusive province of science was in biological phenomena for ever broken

down; every one whose avocations in life had to do with the rearing or use of living things found himself a party to the 'experiment on a gigantic scale,' which had been going on ever since the human race withdrew for their own ends plants or animals from the feral and brought them into the domesticated state." Anyone who, having read Mr. Darwin, has visited, for instance, the show of the Royal Agricultural Society, must have been continually reminded of his observations on "Selection by Man." Indeed the work on the Variation of Animals would be an excellent text book for the show! Mr. Darwin chiefly deals with the minute variations which have been patiently developed by the breeder and the fancier, but in some cases, as he shows in one remarkable passage, new breeds have suddenly appeared. Thus in 1791 a ram lamb was born in Massachusetts, having short crooked legs and a long back, like a turnspit dog, and so was raised the Ancon breed, which, it was supposed, would be valuable because the animals were not able to leap the fences; but they have been supplanted by Merinos. Again, in 1828, a Merino lamb, born on the Mauchamp farm in France, was the parent of the Mauchamp Merinos, with peculiarly valuable fleece; and Mr. Darwin adds—"If these breeds had originated a century or two ago we should have had no record of their birth; and many a naturalist would no doubt have insisted, especially in the case of the Mauchamp race, that they had descended from or been crossed with some unknown aboriginal form."

Round the next work, the *Descent of Man and Selection in Relation to Sex* (1871), the storms of controversy raged for a time with renewed violence, but only to die away again as they had died before; and in the following year a book on the *Expression of the Emotions in Man and Animals* must have helped to put the sternest opponent in good humour with a writer who could instruct him in so pleasant a fashion. *Insectivorous Plants* in 1875, the *Effects of Cross and Self-*

FACSIMILE OF LETTER TO REV. W. A. LEIGHTON.

Nov. 26th 1862.Doton.
Bromley.
Kent. S. E.

My dear Sir

Will you forgive me
 you. - Prof. Oliver has
 called your attention to your
 papers published 10 long ago
 in 1842 on *Epithelium*
angustifolium. - He suggests
 as possible that these forms
 may be reciprocally connected
 like the two forms of
Primmula. I need not
 this fact; but as I am
 writing on *Primmula*, I

Fertilization in the Vegetable Kingdom in 1876, and the *Different Forms of Flowers on Plants of the Same Species* in 1877, supplied more astonishing evidence than ever of the fertility of resource and the rapidity of production which Mr. Darwin associated with his unsurpassed accuracy and attention to detail. To give any description of these works is impossible; Mr. Wallace says they revolutionized the science of botany. In the next work, the *Power of Movement in Plants* (1880), sometimes called the "Circumnutation of Plants," it is interesting to find the name of Francis Darwin associated with his father's on the title page, while Mr. George Darwin assisted in illustrating it; and assistance received from the same source, as well as from his sons William and Horace, is mentioned in Mr. Darwin's last volume, the *Formation of Vegetable Mould*,¹ published in 1881, the year before his death. Indeed Mr. Darwin was fortunate in the help he received, not from his own family alone, but from many observers in different parts of the world; nor can we wonder at this, for every small service received a generous acknowledgment; and, as a writer in the *Athenæum* says, "many persons, in conducting their researches, have had, at the bottom of their hearts, the hope to please Mr. Darwin, and to gain his approbation."

For the unscientific reader the book on *Earth Worms* is perhaps one of the most interesting of Mr. Darwin's works. It is full of curious facts. We learn that worms have no sense of hearing, but they seem to be sensitive in some degree to light and heat; they have a feeble sense of smell, and a decided preference for certain kinds of food over others. For example, they are fond of the leaves of the wild cherry and carrots, preferring them to those of cabbages and turnips, and although horse-raddish leaves are a favourite food, they neglect them when they can get those of onions. After reading what Mr. Darwin says about the way in which

¹ The full title is the *Formation of Vegetable Mould through the Action of Worms, with Observations on their Habits.*

shd. very much like to grow
 to two forms to experiment
 on. - I then by chance
 of your being able to
 explain produce & send me
 with of two forms; it would
 be a great kindness if
 you could. - Anyhow
 pray excuse me venturing
 to trouble you. - With
 my hopes the your health
 is good, I beg leave
 to remain, My dear Sir
 your very faithful
 C. Darwin

worms draw various objects into their holes, generally seizing leaves by the thinner end, and even doing the same with paper triangles, it is almost impossible to doubt that they possess some degree of intelligence. Their burrows "are not mere excavations, but may rather be compared with tunnels lined with cement," and they appear to take elaborate precautions to protect themselves against the cold. The most surprising part of Mr. Darwin's book, however, is that in which he describes the work of the earth-worms in ploughing the soil and gradually changing much of the surface of the globe. In many parts of England a weight of more than ten tons per acre passes annually through their bodies; and the experiments at Down, which have been already mentioned, show that the mould was thrown up at an average rate of 22 inches in a hundred years. In December, 1842, part of a field near Down House was covered with broken chalk, and when a trench was dug in November, 1871, a line of white nodules could be traced seven inches below the surface. Another field, which was converted into pasture in 1841, was called the "stony field," and Mr. Darwin wondered whether he should live to see the larger flints covered, but, thirty years after, a horse could gallop over the compact turf from one end to the other and not strike a single stone with his shoes. Farmers can understand now how lime, cinders, and heavy stone, "work downwards;" and why some of their fields, when they are ploughed up, are so full of stones.

One of the chapters is devoted to the part which worms have played in the burial of ancient buildings; and this chapter has a local interest, for two of its illustrations are drawn from the neighbourhood of Shrewsbury.

Archæologists are probably not aware how much they owe to worms for the preservation of many ancient objects. Coins, gold ornaments, stone implements, &c., if dropped on the surface of the ground, will infallibly be buried by the castings of worms in a few years, and will thus be safely preserved, until the land at some future time is turned up. For instance,

many years ago a grass-field was ploughed on the northern side of the Severn, not far from Shrewsbury; and a surprising number of iron arrow-heads were found at the bottom of the furrows, which, as Mr. Blakeway, a local antiquary, believed, were relics of the battle of Shrewsbury in the year 1403, and no doubt had been originally left strewn on the battle-field. In the present chapter I shall show that not only implements, &c., are thus preserved, but that the floors and the remains of many ancient buildings in England have been buried so effectually in large part through the action of worms, that they have been discovered in recent times solely through various accidents.¹

Amongst the ancient remains examined for Mr. Darwin was the old Roman city of Uriconium, and the work was undertaken by the late Dr. Henry Johnson of Shrewsbury, one of the members of our Society. Dr. Johnson had trenches dug in four fields, and supplied Mr. Darwin with a table of measurements showing the thickness of the vegetable mould over the ruins. It varied from nine inches to forty, a remarkable depth, greater than had been elsewhere observed.

In many places where streets ran beneath the surface, or where old buildings stood, the mould was only eight inches in thickness; and Dr. Johnson was surprised that in ploughing the land, the ruins had never been struck by the plough as far as he had heard. He thinks that when the land was first cultivated the old walls were perhaps intentionally pulled down, and that hollow places were filled up. This may have been the case; but if after the desertion of the city the land was left for many centuries uncultivated, worms would have brought up enough fine earth to have covered the ruins completely; that is if they had subsided from having been undermined. The foundations of some of the walls, for instance those of the portion still standing about twenty feet above the ground, and those of the market-place, lie at the extraordinary depth of fourteen feet; but it is highly improbable that the foundations were generally so deep. The mortar employed in the buildings must have been excellent, for it is still in parts extremely hard. Wherever walls of any height have been exposed to view, they are, as Dr. Johnson believes, still perpendicular. The walls with such deep foundations cannot have been undermined by worms, and

¹ Pp. 176-7.

therefore cannot have subsided, as appears to have occurred at Abinger and Silchester. Hence it is very difficult to account for their being now completely covered with earth; but how much of this covering consists of vegetable mould and how much of rubble I do not know. The market-place, with the foundations at a depth of fourteen feet, was covered up, as Dr. Johnson believes, by between six and twenty-four inches of earth. The tops of the broken-down walls of a caldarium or bath, nine feet in depth, were likewise covered up with nearly two feet of earth. The summit of an arch, leading into an ash-pit seven feet in depth, was covered up with not more than eight inches of earth. Whenever a building which has not subsided is covered with earth, we must suppose, either that the upper layers of stone have been at some time carried away by man, or that earth has since been washed down during heavy rain, or blown down during storms, from the adjoining land; and this would be especially apt to occur where the land has long been cultivated. In the above cases the adjoining land is somewhat higher than the three specified sites, as far as I can judge by maps, and from information given me by Dr. Johnson. If, however, a great pile of broken stones, mortar, plaster, timber, and ashes, fell over the remains of any building, their disintegration in the course of time, and the sifting action of worms, would ultimately conceal the whole beneath fine earth.¹

The book was a fitting close to his career as an author. In writing it he says "the maxim 'de minimis lex non curat' does not apply to science;" and we may say that Darwin achieved success by the degree in which he rejected it. Of the splendid results of caring for trifles, his last work is a conspicuous example; and he sums up the wonderful facts gleaned from nearly half a century of experiment and reflection in the final passage—

When we behold a wide, turf-covered expanse, we should remember that its smoothness, on which so much of its beauty depends, is mainly due to all the inequalities having been slowly levelled by worms. It is a marvellous reflection that the whole of the superficial mould over any such expanse has passed, and will again pass, every few years, through the bodies of worms. The plough is one of the most ancient and most

¹ Pp. 226-8.

valuable of man's inventions; but long before he existed the land was in fact regularly ploughed, and it still continues to be thus ploughed, by earth-worms. It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organized creatures.

Though the book on *Earth Worms* closed the long series of his great works, it was not Mr. Darwin's last word to the public. Amongst other short papers, he afterwards wrote a letter to *Nature* on the means of transport of bivalve mollusca; and this brief account of his writings may be completed by mentioning a contribution to *Mind* on the "Psychogenesis of a Child," to show how wide was the range of Mr. Darwin's observations, and how untiring his endeavour to understand the secrets of Nature. In December, 1883, Mr. Romanes read an Essay by Mr. Darwin on "Instinct," to the Linnæan Society, but Professor Huxley, in the discussion which followed, said he thought it was not a mature work of Mr. Darwin's; and Mr. Wallace was convinced that the manuscript had been written before the publication of the *Origin of Species*, and remained untouched ever since. In this summary we have included all Mr. Darwin's independent works, but he contributed from time to time to the scientific periodicals of the day, and a complete bibliography has yet to be published. If to his own books were added the volumes which have been written to condemn, to defend, or to explain them, at home and abroad, the list would indeed be a long one!

He continued working to the last, happy in this as in so many of the circumstances of his life. On the 17th of April, 1882, he wrote with characteristic courtesy to a correspondent who had challenged a statement in one of his books. "You have misunderstood my meaning; but the mistake was a very natural one, and your criticism good." On Tuesday, the 18th, a notice from his pen, prefixed to a paper on the "Modification of Syrian Street Dogs," was read to the Zoological Society;

and he was able on the evening of that day to examine a plant in his study. But weakness of the heart had troubled him, and he had been in the doctors' hands for some time. After being carried to his bedroom he read for a little while; at midnight serious pains alarmed his family; and at four o'clock on Wednesday afternoon the end came. He retained full consciousness almost to the moment when, sitting by the bedside supported by one of his sons, with his wife and several of his children around, he peacefully closed the life he had lived so well.

A week after, on Wednesday, the 26th of April, in the presence of a vast throng of mourners, his remains were laid in Westminster Abbey, close to the grave of Sir Isaac Newton. The pall-bearers were the Duke of Devonshire, the Duke of Argyll, Mr. Russell Lowell, Lord Derby, Mr. William Spottiswoode, Sir Joseph Hooker, Mr. A. R. Wallace, Professor Huxley, Sir John Lubbock, and Canon Farrar, and about the tomb were gathered most of the other distinguished contemporaries of Mr. Darwin in science, and learning, and statesmanship. The anthem, composed for the occasion by Dr. Bridge, was singularly appropriate—"Happy is the man that findeth wisdom;" and equally appropriate, remembering all the storms which once raged around his name, though they never disturbed the serenity of his lofty spirit, were the words sung at the grave, "His body is buried in peace."

On the following Sunday, Mr. Darwin's death was mentioned in many of the pulpits of the land. At St. Paul's Cathedral, the greatest living preacher, Canon Liddon, said the event was one "of universal importance, since Mr. Darwin's works, besides producing something like a revolution in the modern way of regarding a large district of thought, had shed confessedly so much distinction upon English science." In Westminster Abbey, Canon Prothero spoke of "Mr. Darwin's pure and earnest love of truth and his patient industry in its pursuit;" and the afternoon preacher, the Bishop of

Carlisle, said "he had produced a greater change in the current of thought on certain subjects than any other man, and he had done it by perfectly legitimate means. He observed Nature with a strength of purpose, pertinacity, honesty, and ingenuity, never surpassed;" and, "a brave, simple, hearty, true, loving man, he had presented points of character and conduct which other men might well admire and imitate." In Mr. Darwin's native town, his old schoolfellow, the Rev. J. Yardley, at St. Chad's, the Rev. W. H. Draper, at St. Mary's, and the Rev. E. Myers, at the Unitarian Church, helped to swell the tribute to his greatness as a naturalist and his goodness as a man.

In all civilized lands the news of Mr. Darwin's death was received with profound regret; and it is a singular proof of the unique regard in which he was held, that in a country like Sweden the proposal to provide a memorial of his fame was taken up so eagerly by all classes that in a comparatively short time a sum of nearly £400 was subscribed. In Germany, where during his life he had been made a Knight of the Prussian Order of Merit, it was not surprising that his name should be mentioned with veneration when he died; but Russia has established scholarships in his honour, the municipality of Paris has called one of the streets of the city by his name, and the publication of works on Darwin and Darwinism, in various tongues, bears witness to the interest which is felt, wherever men read and think, in the life and work of our distinguished countryman. A writer in the *Gaulois*, at the time of his death, said that Darwin would remain one of the greatest glories of science. "No one else has so much honoured science by the nobility of his character, by the primitive simplicity of his life, and by his deep and sincere love of truth." *La France* ranked him with Homer and Virgil. The *Neue Freie Presse* said his death "caused lamentation as far as truth had penetrated, and wherever civilization had made any impression." The *New York Herald* described his life as "that of Socrates except its close."

But the most eloquent and touching tribute of all was paid in the pages of the *Allgemeine Zeitung* of Vienna—"We must apologize," it said, "for mentioning political matters on a day when humanity has suffered so great a loss. It seems to us that the world has become gloomier and grown greyer since this star ceased to shine. Our century is Darwin's century. We can now suffer no greater loss, since we do not possess a second Darwin to lose."

Of Mr. Darwin's children, five sons and two daughters, several have inherited their father's love of scientific investigation; and the rare intelligence which has distinguished the family for successive generations continues to bear fruit in the researches of Mr. George Darwin, Plumian Professor at Cambridge, and his brother Francis. Two others, William and Horace, as we have said, assisted in making observations for the work on *Earth Worms*; the fifth, Mr. Leonard Darwin, is an officer in the Royal Engineers. From Mr. Francis Darwin, we are glad to learn, we may expect a biography of his father, which will surely be one of the most interesting books of the age.

Neither of the influence of Mr. Darwin's writings upon modern thought, nor of his religious opinions, is this the place to speak at any length. Another writer, let us hope, versed as the present writer does not pretend to be in the questions which Mr. Darwin discussed and illuminated, will contribute to the *Transactions* of the Shropshire Archæological Society an estimate of his scientific work. In the ultimate results of Mr. Darwin's theory no one can help feeling a profound interest, and, without entering further into the subject, we may quote the following interesting passage from the *Origin of Species*:—"I see no good reason why the views given in this volume should shock the religious feelings of any one. It is satisfactory, as showing how transient such impressions are, to remember that the greatest discovery ever made by man, namely, the law of the attraction of gravity, was also attacked by

Leibnitz, 'as subversive of natural, and inferentially of revealed, religion.' A celebrated author and divine has written to me that 'he has gradually learnt to see that it is just as noble a conception of the Deity to believe that He created a few original forms capable of self-development into other and needful forms, as to believe that He required a fresh act of creation to supply the voids caused by the action of His laws.'" In a letter recently published, Darwin writes—"It seems absurd to me to doubt that a man can be an ardent Theist and Evolutionist;" and a few words in the *Descent of Man* may help still further to clear away some of the mists of prejudice that have gathered about his views of human life and destiny:—"For my own part, I would as soon be descended from that heroic little monkey who braved his dreaded enemy to save the life of his keeper, or from that old baboon who, descending from the mountains, carried away in triumph his young comrade from a crowd of astonished dogs, as from a savage who delights to torture his enemies, offers up bloody sacrifices, practises infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstition. Man may be excused for feeling some pride at having risen, though not through his own exertions, to the very summit of the organic scale; and the fact of his having thus risen, instead of having been aboriginally placed there, may give him hope for a still higher destiny in the distant future."

Mr. Darwin's name is associated almost exclusively in the minds of many persons with the doctrine of Evolution, and there is some danger of overlooking the general influence of his writings on the study of natural history. Other men have taken the lead, from time to time, in geology, or botany, or zoology; he writes of each as if he had made it his peculiar study, and each owes more to him than to any other writer of the day. "He seemed (to use Mr. Thiselton Dyer's words) by gentle persuasion to have penetrated that reserve of nature which baffles smaller men. In other words his

long experience had given him a kind of instinctive insight into the method of attack of any biological problem, however unfamiliar to him, while he rigidly controlled the fertility of his mind in hypothetical explanations by the equal fertility of ingeniously devised experiment. Whatever he touched, he was sure to draw from it something that it had never before yielded, and he was wholly free from that familiarity which comes to the professed student in every branch of science, and blinds the mental eye to the significance of things which are overlooked because always in view.¹ The same writer, dealing with Mr. Darwin's influence on the study of botany, says that a sentence from the *Origin of Species* "may almost be said to be the key-note of Sachs's well-known text-book, which is the most authoritative modern exposition of the facts and principles of plant-structure and function; and there is probably not a botanical class-room or work-room in the civilized world where they are not the animating principle of both instruction and research." Mr. Archibald Geikie writes that "no man of his time has exercised upon the science of Geology a profounder influence than Charles Darwin;" and Mr. Romanes uses even stronger language in dealing with Zoology. "The influence which our great naturalist has exerted upon Zoology (he says) is unquestionably greater than that which has been exerted by any other individual." In other departments of thought and investigation Mr. Darwin was equally great. "The effects of his writings upon Psychology have been immense;" and it is not too much to say that there is scarcely a subject of the highest moment upon which the human mind is engaged, that is not looked at from a new standpoint, and in a different way, because of Mr. Darwin's works.

Of Mr. Darwin's character it is difficult to write truthfully without appearing to indulge in the language of

¹ From papers on Darwin by various writers, contributed to *Nature* and republished in a collected form.

extravagant eulogy. It was acknowledged with universal consent at the time of his death that one of the best as well as one of the greatest of Englishmen had passed away; and persons who may be troubled by Mr. Darwin's theories cannot fail to observe that, whatever else his career has done for us, it has not diminished in the smallest degree the reverence for what is morally and spiritually beautiful. He shared none of the feeling of those persons who seem to suppose that to acknowledge relationship with an ape is something like a surrender of the finer attributes of humanity; but, on the contrary, set an example of a great and beautiful life, which only the best of his contemporaries, whatever their beliefs might be, could hope to imitate. Professor Huxley writes of "the fascination of personal contact with an intellect which had no superior, and with a character which was even nobler than the intellect;" and he says that very few, even of those who had studied Darwin's influence most deeply, "could have been prepared for the extraordinary manifestation of affectionate regard for the man and profound reverence for the philosopher" which followed the announcement of his death. Another of his friends, Dr. William Carpenter, after speaking of the "unsurpassed nobility of his character," observes that "in him there was no 'other side;'" and a finer or juster estimate could scarcely be written! Everybody agrees that devotion to truth was the master-passion of his soul; that he was "the genuine lover, not alone of his fellow-man, but of every creature;" that his genius was only equalled by his modesty. Up to the last he would send a letter to some periodical for publication "with more than the modesty of a tyro;" and a story is told, that six or seven years ago "one of the two most powerful statesmen of the day," Mr. Gladstone, we believe, "was taken to call upon him one Sunday afternoon. Mr. Darwin accompanied his visitor to the gate, and, with cheerful complacency, watched his departing figure through the fields. 'It is a wonderful honour to me,' he said in his

bright and hearty way, to one of the younger of the company, 'to have a visit from such a great man.'” Yet, who can doubt that in the long records of time the man who felt himself so greatly honoured will take the higher place, however high the statesman's rank may be?

For who before had brought to light so many of the secrets of Nature, or worked with so much grace and such a winning courtesy so great a revolution in human thought? He conquered by his methods as well as by his facts. Of the “strife for triumph more than truth” he was simply incapable; and nothing could stand before a controversialist, armed at every point, who yet welcomed criticism, as he hailed a new discovery, because each in its different way helped to bring him near his goal. More than once the name of Socrates has been associated with that of Darwin. “There was the same desire to find some one wiser than himself (says Huxley), the same belief in the sovereignty of reason; the same ready humour; the same sympathetic interest in all the ways and works of men.” Another picture rises in the mind, and that is the picture of a good man, as it is drawn for us by Marcus Aurelius. “For the man who no longer delays being among the number of the best is like a priest and minister of the gods, using too the deity which is planted within him, which makes the man uncontaminated by pleasure, unharmed by any pain, untouched by any insult, feeling no wrong, a fighter in the noblest fight, one who cannot be overpowered by any passion, dyed deep with justice.” Of such a man it is little to say that he is the greatest of Shropshire Worthies; when, of all his illustrious countrymen, so few can be reckoned as his peers, and it is not impossible that future ages will give him the same pre-eminence in Science which is given to Shakespeare in Poetry. As his fame increases with the lapse of time, men will come from far to visit the birthplace of Darwin; and some day, we may be sure, though not yet, they will find in Shrewsbury a fair memorial of his renown.

MR. DARWIN'S CHIEF PUBLICATIONS.

- 1839 JOURNAL OF RESEARCHES (Voyage of Beagle).
 1842 STRUCTURE AND DISTRIBUTION OF CORAL REEFS.
 1844 GEOLOGICAL OBSERVATIONS ON THE VOLCANIC ISLANDS
 visited during the Voyage of H.M.S. Beagle.
 1846 GEOLOGICAL OBSERVATIONS ON SOUTH AMERICA.
 1851 } MONOGRAPH ON THE CIRRIPIEDIA.
 1854 }
 1859 ORIGIN OF SPECIES.
 1862 VARIOUS CONTRIVANCES BY WHICH ORCHIDS ARE
 FERTILIZED.
 1865 MOVEMENTS AND HABITS OF CLIMBING PLANTS.
 1868 VARIATION OF ANIMALS AND PLANTS UNDER DOMES-
 TICATION.
 1871 DESCENT OF MAN.
 1872 EXPRESSION OF THE EMOTIONS.
 1875 INSECTIVOROUS PLANTS.
 1876 EFFECTS OF CROSS AND SELF FERTILIZATION IN THE
 VEGETABLE KINGDOM.
 1877 DIFFERENT FORMS OF FLOWERS ON PLANTS OF THE
 SAME SPECIES.
 1880 POWER OF MOVEMENT IN PLANTS.
 1881 FORMATION OF VEGETABLE MOULD.

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P R E F A C E.

THE reader must be kind enough to remember that the following Memoir was written for the *Transactions* of the Shropshire Archæological and Natural History Society, or he will fail to understand why so much is made of the local references in Mr. Darwin's works. The writer lays no claim to the knowledge which is necessary in dealing with scientific enquiries. He was asked to prepare this short paper, and consented because it seemed to him that the *Transactions* of the Shropshire Natural History Society should certainly contain some memorial of a native of Shrewsbury who became the greatest naturalist of the age. Particulars of Mr. Darwin's early days have been kindly supplied to the writer; and, brief as it is, this record probably supplies the most complete account of his life which has yet appeared. For the sketch of his scientific works many authorities have been consulted, including Mr. Darwin's own statements, and the writer believes it is accurate, although it differs in some points from the accounts published in various scientific periodicals. To prepare this Memoir has been a pleasant task, for it is written as a tribute of profound veneration for the noble character and lofty genius of Mr. Darwin.

Wingthorpe, Oswestry,
August 1st, 1884.

