The Open Court.

A FORTNIGHTLY JOURNAL.

Published every other Thursday at 169 to 175 La Salle Street (Nixon Building), corner Monroe Street, by

THE OPEN COURT PUBLISHING COMPANY.

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The leading object of THE OPEN COURT is to continue the work of *The Index*, that is, to establish religion on the basis of Science and in connection therewith it will present the Monistic philosophy. The founder of this journal believes this will furnish to others what it has to him, a religion which embraces all that is true and good in the religion that was taught in childhood to them and him.

Editorially, Monism and Agnosticism, so variously defined, will be treated not as antagonistic systems, but as positive and negative aspects of the one and only rational scientific philosophy, which, the editors hold, includes elements of truth common to all religions, without implying either the validity of theological assumption, or any limitations of possible knowledge, except such as the conditions of human thought impose.

THE OPEN COURT, while advocating morals and rational religious thought on the firm basis of Science, will aim to substitute for unquestioning credulity intelligent inquiry, for blind faith rational religious views, for unreasoning bigotry a liberal spirit, for sectarianism a broad and generous humanitarianism. With this end in view, this journal will submit all opinion to the crucial test of reason, encouraging the independent discussion by able thinkers of the great moral, religious, social and philosophical problems which are engaging the attention of thoughtful minds and upon the solution of which depend largely the highest interests of mankind.

While Contributors are expected to express freely their own views, the Editors are responsible only for editorial matter.

Terms of subscription three dollars per year in advance, postpaid to any part of the United States, and three dollars and fifty cents to foreign countries comprised in the postal union.

All communications intended for and all business letters relating to THE OPEN COURT should be addressed to B. F. Underwood, P. O. Drawer F, Chicago, Illinois, to whom should be made payable checks, postal orders and express orders.

THURSDAY, MARCH 3, 1887.

DARWIN AND HIS WORK.

Charles Darwin, the great naturalist, died on Wednesday, April 19th, 1882, at his quiet home at Down, England. So retired was the life led by him, that not until two days after his death did the news reach the London papers, but everywhere, as soon as the sad fact was announced, there was a spontaneous outburst of loving regret from the people of every nation where his work was known. Rarely in the world's history has a man of science been so widely recognized during his lifetime, or so sincerely mourned at the time of his death. His own countrymen showed him all the honor possible, in a national way, by claiming for, and awarding him, a place among their immortals in Westminster Abbey, and among his coffin-bearers were the great scientists, Wallace, Hooker, Huxley, Lubbock, and others as distinguished.

Soon after his death the general desire to show honor to his memory for his grand work of enlightenment found expression in a Darwin fund, to which came contributions from Austria, Belgium, Brazil, Denmark, France, Germany, Holland, Italy, Norway, Portugal, Russia, Spain, Sweden, Switzerland and the United States, in addition to what was given by his own nation and its colonies. A part of this large fund was used in the erection of a commemorative statue, while the surplus is held in trust by the Royal Society of Great Britain to be used in the promotion of biological research.

The statue, when completed, was unveiled in the great hall of the Natural History Rooms of the British Museum, on the 9th of June, 1885, the addresses being made by Prof. Huxley, in presentation, and by the Prince of Wales in acceptance for the Museum. It is recorded that on that occasion "around the statue were congregated the most representative men of every branch of culture, from the Prince of Wales and the Archbishop of Canterbury to the opposite extremes of radicalism and free thought. Indeed, it is not too much to say that there can scarcely ever have been an occasion on which so many illustrious men of opposite ways of thinking have met to express a common agreement upon a man to whom they felt that honor was due."

What were the services which commanded for this modest, unpretentious student this world-wide admiration and appreciation? He had, living, made no claims to superiority of intellect or knowledge; he was a man of domestic tastes, quiet habits and unassuming mode of life. He had never been prominent on public occasions, was rarely heard at great dinner parties; he cared nothing whatever for the world of fashion, was no authority on art, shone little in the phosphorescent light of *belles-lettres*. Huxley answers our question in his address in behalf of the Darwin Memorial Committee: "The causes of this wide outburst of emotion are not far to seek," he said. "We had lost one of those rare ministers and interpreters of nature whose names mark epochs in the advance of natural knowledge. For whatever be the ultimate verdict of posterity upon this or that opinion which Mr. Darwin propounded; whatever adumbrations or anticipations of his doctrines may be found in the writings of his predecessors, the broad fact remains that since the publication, and by reason of the publication, of 'The Origin of Species,' the fundamental conceptions and the aims of the students of living nature have been completely changed. From that work has sprung a great renewal, a true 'instauratio magna' of the zoological and botanical sciences. * * * The impulse thus given to scientific thought rapidly spread beyond the ordinarily recognized limits of biology. Psychology,

ethics, cosmology, were stirred to their foundation, and 'The Origin of Species' proved itself to be the fixed point which the general doctrine of evolution needed to move the world."

Intellectually, Darwin was of royal pedigree and family. His paternal grandfather, Dr. Erasmus Darwin, was one of the pioneer teachers of the theory of evolution long before his illustrious grandson was born; he was a thinker, philosopher and poet, author of "Zoönomia," "The Botanic Garden," "The Temple of Nature," and other works. His great-grandfather, Robert Darwin, is described in local records as "a person of curiosity," with "a taste for literature and science," and "an embryo geologist." His grand-uncle, Robert Darwin, was the author of a work on botany of considerable repute. His father, Robert Waring Darwin, was a physician of eminence at Shrewsbury and a Fellow of the Royal Society. His father's brother, Sir Francis Darwin, was noted as a keen observer of animals. Another uncle, Charles Darwin, who died at twenty-one, was author of a valuable medical work. His mother, who died while he was yet a child, was a daughter of the famous potter, Josiah Wedgewood, a careful and painstaking observer. Among his cousins, on the mother's side, were Hensleigh Wedgewood, the Philologist, Sir Henry Holland, and Francis Galton, the scientist and authority on heredity. His wife was a Miss Wedgewood, his cousin, and his sons are eminent in science.

But not wholly to pedigree or family predilections is the work and fame of Darwin due. That, in great part, is owing to rare personal qualifications—to his unswerving devotion to the study of Nature, to his phenomenal patience, to his careful observation, to his unwearied perseverance and continuity of purpose, to his generous recognition of fellow-students, to his genuine and rare modesty, and to his grandly simple rectitude of character.

Charles Robert Darwin—*the* Darwin of the Darwins—was born at Shrewsbury, England, February 12th, 1809. His family were in good circumstances, and no unpropitious "environments" hindered his natural bent toward scientific investigation. Family connections, neighborhood tendencies, and inherited proclivities combined to make him the fine character he was.

His scholastic education commenced at Shrewsbury, where, as a school-boy, "coming events cast their shadows before," in his delight in collecting shells, minerals, eggs, coins, etc., showing his bias toward investigation and classification. At sixteen he was sent to the University at Edinburgh, where one of his earliest papers, prepared for an Academical Society, was on "The Floating Eggs of the Common Sea-Mat," setting forth his discovery of organs of locomotion in this low form of marine life.

From 1827 to 1831 he was a student at Christ College, Cambridge, where he was fortunate in having the companionship and guidance of such thinkers as Prof. Henslow, Airy, Sidgwick, Ramsay and others.

He was only twenty-two, an age at which most young men are busy "sowing their wild oats," when the chance of accompanying Capt. Fitzroy, on the government ship Beagle, on a voyage of scientific discovery round the world, was presented to him. Though he understood that the trip would be of several years duration, and might be in some respects dangerous; though his services were to be gratuitous (with the privilege only of retaining as his own the specimens collected on the trip), yet he eagerly accepted the opportunity; and his five years of exile from home and friends were years of delight to his soul, and during those years was laid the foundation of all his noble after-work of discovery and experiment. His work as a writer began when, after his return, he contributed three volumes to the series recording the observations made during the voyage of the Beagle—"Volcanic Islands," "Geological Observations on South America," and his valuable Essay on "Coral Reefs."

Three years after his return, at the age of thirty, he married a cousin, Miss Emma Wedgewood, daughter of his uncle Josiah Wedgewood. Within a few years of his marriage he built his family mansion at Down and instituted the beginnings of his series of practical experiments, the results of which, when long afterward presented to the public in his "Origin of Species," were accepted as indisputable testimony to the truth of what had been until then held as theory only, but which, when thus fortified, was accepted by the world at large, as well as by brother scientists, as incontrovertible and demonstrated truth.

He gave the best years of his life to these experiments, forsaking for them all public emoluments and honors, and all other pursuits. "Early to bed and early to rise; wandering unseen among the lanes and paths, or riding slowly on his favorite black cob, the great Naturalist passed forty years happily and usefully at Down, where all the village knew and loved him," wrote Grant Allen; yet, every day probably, in all these years, he was, with deliberation, with careful exactness and thoughtful judgment, making experiments of all kinds with plants, insects, birds and animals; browsing in all the highways and byways of literature and ferreting out the secrets of individual experience for facts bearing on the subjects in mind; trying in every thinkable way to test the accuracy of his biological surmises. His admiring

and admirable friend and scientific compeer, Alfred R. Wallace, says, on this point, that soon after his return from his memorable Beagle voyage "he had already perceived that no explanation but some form of the derivation or development hypothesis, as it was then termed, would adequately explain the remarkable facts of distribution and geological succession which he had observed during his voyage, yet he tells us that he worked on for five years before he allowed himself to speculate on the subject, and then, having formulated his provisional hypothesis in a definite shape during the next two years, he devoted fifteen years or more to continuous observation, experiment and literary research, before he gave to the astonished scientific world an abstract of his theory in all its wide-embracing scope and vast array of evidence in his epoch-making volume, "The Origin of Species." If we add to the period enumerated above, the five years of observation and study during the voyage, we find that this work was the outcome of *twenty-nine* years of continuous thought and labor by one of the most patient, most truth-loving and most acute intellects of our age."

Alfred Russell Wallace, with a modesty characteristic of both himself and Darwin, omits to state, in the sketch from which the foregoing paragraph is taken, that the publication of the "Origin of Species" was hastened because of a striking memoir which he (then absent on a voyage of tropical discovery) had sent on to Darwin in 1858, with a request that he forward it to Sir Charles Lyell for presentation to the Linnean Society. To Darwin's surprise he found, on reading it, that it contained his own theory of natural selection, not worked out in detail as he himself was working it out, but still complete in spirit and essence. Sir Charles Lyell and Sir Joseph Hooker, who were aware of Darwin's own unpublished work, both urged him to publish a few extracts from that work in the same journal in which Wallace's paper was to appear, and the two contributions were read together before the Linnean Society, July 1, 1858. "That double communication" says Grant Allen, "marks the date of the birth of modern evolutionism." Darwin decided that it was time to give to the world some of the results of his experiments with his conclusions in regard to them and "The Origin of Species" was published in November of the following year, 1859. Says the writer last quoted from, "that book was one of the greatest, the most learned, the most lucid, the most logical, the most crushing, the most conclusive that the world has ever yet seen. Step by step, and principle by principle, it proved every point in its progress triumphantly before it went on to demonstrate the next."

The work excited immediate attention and aroused hot discussion, and in less than six weeks after its publication was in such demand that it had become famous and a second edition was called for and put upon the market. Darwin was over fifty when "The Origin of Species" was published. It was to have been one of a long series which he contemplated, but ill health prevented him from finishing that series to his own satisfaction before his death, at the age of seventy-three, though doubtless the most important ones were given to the public, since other scientists, by their work in the same direction, filled up the gap thus left. In spite of his constant work and study Darwin was for a great part of his life a semi-invalid, but he made every moment of available time of purpose to science. Among the works published by him were "The Descent of Man," which awoke still further opposition and discussion from orthodox thinkers, though the battle had been in effect won by the earlier work, "The Variation of Animals and Plants Under Domestication," "Emotional Expressions of Man and the Lower Animals," "Insectivorous Plants," "Fertilization of Orchids," "Movement and Habits of Climbing Plants," "The Effect of Cross and Self Fertilization," "Power of Movement in Plants," and "The Formation of Vegetable Mould Through the Action of Worms." In regard to this last work it may be noted as an instance of his remarkably painstaking experimenting, that having early had his attention called to the subject, from a suggestion from his father-in-law, Josiah Wedgewood, soon after he built his family mansion at Down, in 1842, he began to spread broken chalk over a certain field, which he let remain undisturbed to the action of earth-worms until 1871, when a trench was dug to test the results, an experiment taking twenty-nine years!

His experiments were never absent from his thoughts. In his garden and his conservatory some of these were ever in progress. Col. Higginson tells us how, on a certain visit to Darwin, when he remained over night, he happened to look out of his window very early in the morning and "seeing him hurrying in from the remoter part of the green garden with a great shawl wrapped around his head, his white hair and beard emerging from it—a singularly unconscious, absorbed, eager figure. I asked his son afterward what his father was out there at that time in the morning for in his impaired condition of health? 'O, yes,' said his son, 'he is always at it. He always says he is not doing anything at all. But he always has one of his little experiments, as he calls them, going on out there in the garden, and he has to look at them two or three times every night.'"

Every one who ever met the great Naturalist—lofty and noble in figure, as in mind—bears testimony

to his lovable qualities. "To that charming candor and delightful unostentatiousness which everybody must have noticed in his published writings," says Mr. Allen, "he united, in private life, a kindliness of disposition, a width of sympathy, and a ready generosity which made him as much beloved by his friends as he was admired and respected by all Europe." No one was so much surprised at the honors shown him as himself. John Fiske says: "When I first met Mr. Darwin in London, in 1873, he told me that he was surprised at the great fame which his book instantly won, and at the quickness with which it carried conviction to the minds of all the men on whose opinions he set the most value."

He mingled little in general society, but enjoyed the personal acquaintance and friendship of most of the leading scientific men of Europe and this country. Two or three years of his earlier married life were spent in London, and we read of him at this period in the Carlyle reminiscences as dropping in of an evening for a friendly chat with Mrs. Carlyle, or of her taking a drive with him to see his new house at Down, and again of Carlyle being absent "at dinner at Darwins," etc. He was not at all a self-assertive, self-conscious man or Scientist, but only a sincere lover of science, and an ardent investigator of the ever-tempting, tantalizing and beckoning promises of revealment of the wonderful mysteries of the Universe. His grandfather's words in his poem, "The Temple of Nature," might have been his own invocation.

> "Priestess of Nature! while with pious awe
> Thy votary bends, the mystic veil withdraw;
> Charm after charm, succession bright, display,
> And give the goddess to adoring day!"

S. A. U.

SCIENCE vs. THEOLOGY.

Science emphasizes the importance of investigation. It says investigate and then believe or disbelieve according to the weight of evidence. Theology says, believe first and then investigate if you choose, but be careful that investigation does not weaken your faith. Science teaches that doubt is necessary to inquiry and that inquiry is necessary to intellectual progress. Theology, by condemning doubt, discourages impartial search for truth and, at the same time, courage and independence of thought. The faith of the man of science is conviction founded upon evidence. Theological faith does not admit of proof or verification. The authorities of science are those who have made their subjects matters of years of laborious study; yet an appeal from their statements is always open to any one who can show their error or inadequacy. The authorities of theology are ancient characters who are held in veneration on account of their alleged inspiration, and appeal from whose declaration is pronounced sinful and perilous.

The object of science is Nature—the world of phenomena, whose ongoings are open to our observation and contemplation. The object of theology is the supposed attributes, plans and purposes of the unknown cause of phenomena. Science is knowledge classified and methodized. For convenience we label a certain class of facts astronomy, geology, chemistry, biology, etc., but all these sciences are but segments of a circle, parts of one great science—the science of the universe. All the sciences being related, there can be no complete knowledge of any without thorough knowledge of all.

When we go beyond the region of observation and experience, and beyond the possibility of data for our beliefs, we pass from the region of science to that of theology. Theology begins where knowledge ends. The empire of science is continually enlarging, while that of theology is yielding its territory just as fast as the complex groups of phenomena in which it entrenches itself are shown by scientific discoveries to belong to the region of law and causation. Miracles, like ghosts, vanish as the light approaches. Theology is retreating from field to field, and is now pleading for the right to recognition as the science of that which is beyond phenomena—the light that never was on land or sea. The various conceptions of the eternal mystery in regard to which theology dogmatizes are but so many mirrors from which men see reflected their own mental and moral faces. Man projects ideally his own intelligence and volition out upon the field of phenomena and imagines that he is studying the plans and purposes of God, when he is unconsciously studying his own nature. This illusion is the foundation of theology which, carefully analyzed, reveals not the plans and purposes of Infinite Intelligence, but the conceptions and feelings of man, formulated into dogmas and made realizable to the ignorant by ritualisms which appeal to eye and ear. The key to theology is anthropology, because the actual object of theology is a conceptual being entirely human in its intellectual and moral characteristics. The existence of that power in which we move and live, which rounds a pebble and forms a planet, which germinates a seed and evolves an animal, even the wonderful structure and yet more wonderful mind of man, is indubitable, though one declines to limit it by definitions or to give it human attributes.

Science shows that the present order of things is the product of the modification of pre-existent orders. All leading scientific thinkers regard evolution so well established as not likely to be shaken in its main conclusion. From simple conditions has grown a world diversified in appearance and teeming with differentiated life. The higher forms have a genetic kinship with lower forms. As structural modifications have resulted in the body, so