

ored to show that variations, perhaps even adaptations, were the result of extrinsic factors acting upon the organism, and that these variations or adaptations were increased and improved by natural selection. This is, I believe, the only ground which is at present tenable; and it is but another testimony to the greatness of that man of men, that, after exploring for a score of years all the ins and outs of pure selection and pure adaptation, men are now coming back to the position outlined and unswervingly maintained by him."

Says Mr. Darwin: "To my mind it accords better with what we know of the laws impressed on matter by the Creator that the production and extinction of the past and present inhabitants of the world should have been due to secondary causes, like those determining the birth and death of an individual. When I view all things, not as special creations but as the lineal descendants of some few beings who lived before the first bed of the Silurian was deposited, they seem to me to become ennobled. There is a 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, while this planet has gone cycling on according to the fixed laws of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being evolved."

Darwin died at Down on April 19, 1882, at the age of seventy-three years. Among all men of science none have been so great as he and none more lovable. No one who knew him has ever had a word to say against his personal character. He was the greatest of naturalists by virtue of sheer greatness of soul.

Among the last words which he wrote were these: "As

for myself, I believe that I have acted rightly in steadily following and devoting my life to science. I feel no remorse from having committed any great sin, but I have often and often regretted that I have not done more direct good to my fellow creatures."

A Chinese sage, whose words remain, but whose name has been lost in the ages between him and us, has said: "He cannot be concealed: he will appear without showing himself, effect renovation without moving, and create perfection without acting. It is the law of heaven and earth, whose way is solid, substantial, vast, and unchanging."

Not long ago I walked across the Kentish pastures to the little village of Down. I visited Darwin's home, a stately old-fashioned country mansion surrounded by trees and shut in by an ivy-covered wall. I talked with the villagers, who had been his neighbors all their lives, and to whom he was not the world-renowned naturalist but the good gray man whom everybody knew and loved. I learned some things which the books do not tell us of his simple, kindly ways, his warm friendships, and his quiet but wide-reaching charities. I have from this a clearer picture of Darwin as he was. His love for his wife and children, his love for birds and flowers and trees, his love for simplicity and truth—all these stand as the clear background before which rises the noblest work in science.

Twenty-five years ago obloquy, ridicule and abuse were heaped on the name of Darwin from all sides, sometimes even from his scientific associates. He has outlived it all, and a few years ago his mother country paid him the highest tribute in her power. He lies in Westminster Abbey by the side of Isaac Newton, one of the many noble prede-

cessors who have made his own life possible. Among all who have written or spoken since then, whatever their religious or scientific faith, by none has an unkind word been said. He was a gentle, patient and reverent spirit, and by his life not only science, but our conception of Christianity, has been advanced and ennobled.

CHARLES DARWIN

SELECTED STUDIES AND REMINISCENCES

DARWIN THE REVOLUTIONIZER OF MODERN THOUGHT

If ever a man's ancestors transmitted to him ability to succeed in a particular field, Charles Darwin's did. If ever early surroundings were calculated to call out inherited ability, Charles Darwin's were. If ever a man grew up when a ferment of thought was disturbing old convictions in the domain of knowledge for which he was adopted, Charles Darwin did. If ever a man was fitted by worldly position to undertake unbiased and long-continued investigations, Charles Darwin was such a man. And he indisputably found realms waiting for a conqueror. Yet Darwin's achievements far transcend his advantages of ancestry, surroundings, previous suggestion, position. He stands magnificently conspicuous as a genius of rare simplicity of soul, of unwearied patience of observation, of striking fertility and ingenuity of method, of unflinching devotion to and belief in the efficacy of truth. He revolutionized not merely half-a-dozen sciences, but the whole current of thinking men's mental life.—G. T. BETTANY, in "Life of Charles Darwin," in "Great Writers" Series.

DARWIN'S SIMPLICITY AND MODESTY OF CHARACTER

"Arrogance, irritability and envy, the faults that ordinarily beset men of genius, were not so much conquered as non-existent, in Darwin's singularly simple and generous mind. It never occurred to him that it would be to his gain to show that he and not some one else was the author of a discovery. If he was appealed to for help by a fellow-worker, the thought never passed into his mind that he had secrets to divulge which would lessen his importance. It was science, not the fame of science, that he loved, and he helped science by the temper in which he approached it. He had to say things which were distasteful to a large portion of the public, but he won the ear, even of his most adverse critics, by the manifest absence of a mere desire to shine, by his modesty, and by his courtesy. He told honestly what he thought to be the truth, but he told it without a wish to triumph or to wound. There is an arrogance of unorthodoxy as well as an arrogance of orthodoxy; and if ideas that a quarter of a century ago were regarded with dread are now accepted without a pang, the rapidity of the change of opinion, if not the change itself, is largely due to the fact that the leading exponent of these ideas was the least arrogant of men."—*The Saturday Review.*
Quoted by G. T. Bettany.

DARWIN'S PERSONALITY

"In Darwin's own carriage, which he had thoughtfully sent for my convenience to the railway station, I drove

one sunny morning in October, through the graceful, hilly landscape of Kent, that with the chequered foliage of its woods, with its stretches of purple heath, yellow broom, and evergreen oaks, was arrayed in its fairest autumnal dress. As the carriage drew up in front of Darwin's pleasant country house, clad in a vesture of ivy, and embowered in elms, there stepped out to meet me from the shady porch, overgrown with creeping plants, the great naturalist himself, a tall and venerable figure, with the broad shoulders of an Atlas supporting a world of thought; his Jupiter-like forehead highly and broadly arched, as in the case of Goethe, and deeply furrowed with the plough of mental labor; his kindly, mild eyes looking forth under the shadow of prominent brows; his amiable mouth surrounded by a copious silver-white beard. The cordial, prepossessing expression of the whole face, the gentle, mild voice, the slow, deliberate utterance, the natural and naïve train of ideas which marked his conversation, captivated my whole heart in the first hour of our meeting, just as his great work had formerly, on my first reading it, taken my whole understanding by storm. I fancied a lofty world-sage out of Hellenic antiquity—a Socrates or Aristotle—stood before me."—PROFESSOR ERNST HAECKEL, *Author of "The History of Creation."* Quoted by G. T. Bettany.

DARWIN'S INTRINSIC NOBLENESS AND LOVABLENESS

Of Darwin's pure and exalted moral nature no Englishman of the present generation can trust himself to speak with becoming moderation. His love of truth, his singleness of heart, his sincerity, his earnestness, his modesty,

his candor, his absolute sinking of self and selfishness—these, indeed, are all conspicuous to every reader, on the face of every word he ever printed. Like his works themselves, they must long outlive him. But his sympathetic kindness, his ready generosity, the staunchness of his friendship, the width and depth and breadth of his affections, the manner in which "he bore with those who blamed him without blaming them in return," these things can never so well be known to any other generation of men as to the three generations who walked the world with him. Many even of those who did not know him loved him like a father; to many who never saw his face the hope of winning Charles Darwin's approbation and regard was the highest incentive to thought and action. Towards younger men, especially, his unremitting kindness was always most noteworthy: he spoke and wrote to them, not like one of the masters in Israel, but like a fellow-worker and seeker after truth, interested in their interests, pleased at their successes, sympathetic with their failures, gentle to their mistakes. Not that he ever spared rightful criticism; on the contrary, the love of truth was with him so overpowering and enthralling a motive that he pointed out what seemed to him errors or misconceptions in the work of others with perfect frankness, fully expecting them to be as pleased and delighted at a suggested amendment of their faulty writing as he himself was in his case. But his praise was as generous as his criticism was frank; and amid all the toil of his laborious life in his study at Down, he could always find time to read and comment at full length upon whatever fresh contributions to his own subjects the merest tyro might venture to submit for his consideration. He had the

sympathetic receptivity of all truly great minds, and when he died, thousands upon thousands who had never beheld his serene features and his fatherly eyes felt that they had lost indeed a personal friend.

Greatness is not always joined with gentleness: in Charles Darwin's case, by universal consent of all who knew him, "an intellect which had no superior" was wedded to "a character even nobler than the intellect."—GRANT ALLEN, in "*Charles Darwin*," in "*English Worthies*" Series.

DARWIN'S USE OF THE IMAGINATION

As to Darwin's place in literature, that is due supereminently to his thoughts. In his expression of them he had the saving quality of directness, and usually wrote with simplicity. Incisive he was not, ordinarily; caution of his type harmonizes ill with incisiveness. But what he lost thereby he gained in solidity and in permanence. Sometimes, as we have pointed out, his imagination carried him beyond his usual sober vein, and then he showed himself aglow with feeling or with sympathetic perfection.

But when we speak of his imagination we pass at once to the other side of his mind—if indeed any such patient inquiry as his could have been maintained except for the imaginative side of him. This lit up his path, buoyed him in difficulties and failures, suggested new expedients, experiments, and combinations. The use of imagination in science has never been more aptly illustrated nor more beneficial than in his case. Darwin, more than any other man, perhaps, showed the value, if not the essentiality, of

"working hypotheses"; and if any man now wants to progress in biology, he will be foolish if he does not seek such, and use them freely, and abandon them readily if disapproved.—G. T. BETTANY.

DARWIN ON MAN'S LOWLY ORIGIN

In summing up on the entire subject [of the "Descent of Man,"] Darwin expresses himself with more than his wonted vigor and point. On the one hand he endeavors to disarm opposition by quoting heroic monkeys as contrasted with degraded barbarians; on the other hand, he welcomes the elevation of man so far above his barbarous ancestors. Finally, he stands upon truth, as against likes and dislikes. "The astonishment which I felt on first seeing a party of Fuegians on a wild and broken shore will never be forgotten by me, for the reflection at once rushed into my mind—such were our ancestors. These men were absolutely naked and bedaubed with paint; their long hair was tangled, their mouths frothed with excitement, and their expression was wild, startled, and distrustful. They possessed hardly any arts, and, like wild animals, lived on what they could catch. They had no government, and were merciless to everyone not of their own small tribe. He who has seen a savage in his native land will not feel much shame if forced to acknowledge that the blood of some more humble creature flows in his veins. For my own part, I would as soon be descended from that heroic little monkey, who braved his dreaded enemy in order 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 sacrifice, practices infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions.—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 originally placed there, may give him hopes of a still higher destiny in the distant future. But we are not here concerned with hopes or fears, only with the truth as far as our reason allows us to discover it. I have given the evidence to the best of my experience; and we must acknowledge, as it seems to me, that man, with all his noble qualities, with sympathy that feels for the most debased, with benevolence which extends not only to other men, but to the humblest living creature, with his God-like intellect which has penetrated into the movements and constitution of the solar system—with all these exalted powers—man still bears in his bodily frame the indelible stamp of his lowly origin.”

—G. T. BETTANY. *The quotation is from Darwin's "Descent of Man," first published in 1871.*

DARWIN'S SUCCESS

Darwin won, as far as a man can win, success during his lifetime. As Professor Huxley said, in lecturing on “The Coming Age of ‘*The Origin of Species*,’” “the foremost men of science in every country are either avowed champions of its leading doctrines, or at any rate abstain from opposing them.” His prescience has, in less than a generation, been justified by the discovery of inter-

mediate fossil forms of animals too numerous to be here recounted. The break between vertebrate and invertebrate animals, between flowering and non-flowering plants, between animal and plant, is now bridged over by discoveries in the life histories of animals and plants which exist to-day. Embryo animals and plants are now known to go through stages which repeat and condense the upward ascent of life; and they give us information of the greatest value as to lost stages in the past. We can, as it were, see the actual track through which evolution may have proceeded. “Thus,” says Professor Huxley, “if the doctrine of evolution had not existed, palæontologists must have invented it, so irresistibly is it forced upon the mind by the study of the remains of the Tertiary mammalia which have been brought to light since 1859.”—G. T. BETTANY.

DARWIN'S TRUE POSITION WITH RESPECT TO THE THEORY OF EVOLUTION

In the public mind Darwin is, perhaps, most commonly regarded as the discoverer and founder of the evolution hypothesis. Two ideas are usually associated with his name and memory. It is believed that he was the first propounder of the theory which supposes all plant and animal forms to be the result, not of special creation, but of slow modification in pre-existent organisms. It is further and more particularly believed that he was the first propounder of the theory which supposes the descent of man to be traceable from a remote and more or less monkey-like ancestor. Now, as a matter of fact, Darwin was not the prime originator of either of these two great

cardinal ideas. Though he held both as part of his organized theory of things, he was not by any means the first or the earliest thinker to hold them or to propound them publicly. Though he gained for them both a far wider and more general acceptance than they had ever before popularly received, he held no sort of claim himself to originality or proprietorship in either theory. The grand idea which he did really originate was not the idea of "descent with modification," but the idea of "natural selection," by which agency, as he was the first to prove, definite kinds of plants and animals have been slowly evolved from simpler forms, with definite adaptations to the special circumstances by which they are surrounded. In a word, it was the peculiar glory of Charles Darwin, not to have suggested that all the variety of animal and vegetable life might have been produced by slow modifications in one or more original types, but to have shown the nature of the machinery by which such a result could be actually attained in the practical working-out of natural causes. He did not invent the development theory, but he made it believable and comprehensible. He was not, as most people falsely imagine, the Moses of evolutionism, the prime mover in the biographical revolution; he was the Joshua, who led the world of thinkers and workers into full fruition of that promised land which earlier investigators had but dimly descried from the Pisgah-top of conjectural speculation.—GRANT ALLEN.

DARWIN'S INFLUENCE UPON THE SPREAD OF THE DOCTRINE
OF EVOLUTION

It is to Darwin, and to Darwin almost alone, that we owe the present comparatively wide acceptance of the all-em-

bracing doctrine of evolution. No other man did so much, or could have done so much, to ensure its triumph. He began early in life to collect and arrange a vast encyclopædia of facts, all finally focussed with supreme skill upon the great principle he so clearly conceived, and so lucidly expounded. He brought to bear upon the question an amount of personal observation, of minute experiment, of world-wide book-knowledge, of universal scientific ability, such as never perhaps was lavished by any other man upon any other department of study. His conspicuous and beautiful love of truth, his unflinching candor, his transparent fearlessness and honesty of purpose, his childlike simplicity, his modesty of demeanor, his charming manner, his affectionate disposition, his kindness to friends, his courtesy to opponents, his gentleness to harsh and often bitter assailants, kindled in the minds of men of science everywhere throughout the world a contagious enthusiasm, only equalled perhaps among the disciples of Socrates and the great teachers of the revival of learning. His name became a rallying-point for the children of light in every country; and what philosophers and speculators might have taken a century or two more to establish in embryo, was firmly grounded, never to be overthrown, by the vast accumulations of fact and argument in the "*Origin of Species*," and its companion volumes.—GRANT ALLEN.

READERS' AND STUDENTS' NOTES

1. With respect to Darwin there is of course an extent of literature exceeding that devoted to any other scientist on our list. We shall mention only those works that are of popular interest; that is, those in which the general reader, as distinguished from the special scientific student, will take an interest.—The standard life of Darwin is "*The Life and Letters of Charles Darwin*," edited by his son, Francis Darwin. (New York: D. Appleton & Co. 2 vols., \$5.00.) This "life" is especially valuable because of its autobiographic chapter. What is practically an abridgment of this "life" is the work in one volume entitled "*Charles Darwin's Life, Edited by his Son*." (New York: D. Appleton & Co. \$1.50.)

2. One of the most useful and most interesting of the short "lives" of Darwin is Grant Allen's volume in the "*English Worthies*" series, entitled simply "*Charles Darwin*." Grant Allen, himself a distinguished naturalist, and one of the most instructive and entertaining writers in the whole realm of scientific literature, has made of this little book a veritable classic. (New York: D. Appleton & Co. 75 cents.)

3. G. T. Bettany's "*Life of Darwin*," in the "*Great Writers*" series, is also an excellent account of Darwin's life and work. Apart from its other merits this work is especially valuable for its bibliography. It must be stated, too, that both the preceding work and this one give the reader a pretty good idea of what is meant by "Darwinism," and the principle of "natural selection," and so on.

4. A more recent work on Darwin and "Darwinism" is the volume in "*The Century Science Series*," entitled "*Charles Darwin, and the Theory of Natural Selection*," by Edward B. Poulton, F. G. S., F. R. S., etc., Professor of Geology at the University of Oxford. (New York: The Macmillan Co. \$1.25.) This work is divided up into a great many chapters, and in consequence every phase of Darwin's life, character, and work, is duly emphasized.

5. Other works of popular interest bearing on Darwin's work,

and the exposition of the theory of natural selection, etc., are the following: "*Darwinism Stated by Darwin Himself*," being characteristic passages from the writings of Darwin, selected and arranged by Professor N. Sheppard (New York: D. Appleton & Co. \$1.50); "*Darwinism and Other Essays*," by John Fiske (Boston: Houghton, Mifflin & Co.); "*Darwiniana*," essays and reviews pertaining to Darwinism, by Asa Gray (New York: D. Appleton & Co.); "*The History of Creation*," a "popular exposition of the doctrine of evolution in general and that of Darwin, Goethe, and Lamarck in particular" by Ernst Haeckel (New York: D. Appleton & Co. \$5.00); and "*Darwiniana*" and "*Man's Place in Nature*," by Professor T. H. Huxley (New York: D. Appleton & Co. \$1.25 each). Huxley's "*Darwiniana*" contains an excellent biographical sketch of Darwin, prepared for the "*Proceedings*" of the Royal Society.

6. A most important work on Darwinism in particular, and the history of the doctrine of evolution in general—important, that is to say, with respect to the needs of the general reader—is Edward Clodd's "*Pioneers of Evolution from Thales to Huxley*." (New York: D. Appleton & Co. \$1.50.) In this work the relative parts borne in the development of evolution by Darwin, Alfred Russell Wallace, Herbert Spencer, and Huxley, are duly considered. The volume is beautified by some exceedingly good portraits.

7. A life of Darwin prepared for young readers, or rather for young readers as well as old, deserves special mention. This is "*Charles Darwin, His Life and Work*," by Charles Frederick Holder, LL. D., in "*Leaders of Science*" series. (New York: G. P. Putnam's Sons. \$1.50.) In the preface the author says: "I was particularly gratified with the suggestion by the publisher that the work should be adapted to young readers as well as old. It has always seemed to me that the life of Charles Darwin was one essentially fitted to be held up as an example to youth." The author has excellently carried out his idea, and his work is to be commended highly. The publishers have illustrated the book most sumptuously.