EDITORIAL NOTES.

A DISCIPLE OF SCIENCE.

THE hunger for truth; the quenchless desire to obtain knowledge, to catch and interrogate the vague phantoms of facts which float but dimly before the intellectual vision; to satisfy the deathless craving of the soul; to know the mysteries of Nature,—such are the innate longings which fill the soul and fire the brain of earth's great prophets and pioneers in science. The recluse of the Middle Ages, who abandoned the frivolity of life and withdrew into the wilderness, hoping by a life of deprivation to insure eternal bliss, was not the lofty soul he has been painted. His promptings were selfish; his course that of a coward. In bold antithesis stand the lives of two great modern disciples of science, Charles Darwin and Alfred Russell Wallace, who renounced the comforts of home life, the companionship of congenial spirits, the pleasures of social life, the acquirement of wealth, and the pursuit of popularity and contemporaneous renown, for years of privation 'neath the burning suns of the torrid zone, that they might happily demonstrate a truth which they suspected, though well they knew that its demonstration would cover them for a time with obloquy; that ridicule, misrepresentation, calumny, and social ostracism would follow them if they succeeded in proving the great theory of evolution, of which Buffon, St. Hilaire and Erasmus Darwin had caught vague glimpses, and which Lamarck had foreshadowed, but which was so foreign to the accepted views of the religious and intellectual conservatism of the age as to necessarily encounter furious opposition, and the scornful contempt or fierce anathemas of those leaders to whom the masses look for a cue. Yet fronting the severe privations and well known perils on the one hand, and expecting the common fate of truths, prophets, pioneers, and torchbearers, they went forth, led only by a great yearning to demonstrate a new truth, desiring only the supreme satisfaction of having helped the world to a broader vision by contributing to its store of scientific knowledge. Of the life of Charles Darwin, so long sneered at by the religious and fashionable world, but now justly revered by the scholarship of Christendom, it is not our purpose to write at the present time. It is well known, and gains in glory as, step by step, the intellectual world rises to the acceptation of the truths he presented. That of his friend and co-laborer, Dr. Wallace, though not so well known, because he is still with us, and because he has ever sought to hold the truth between himself and the world, is rich in interest and instruction. Born in Usk, in Monmouthshire, on the eighth of January, 1822, he early evinced a passion for everything relating to natural history. Aside from his general education, he received special education in architecture and survey-

ing, as it was deemed advisable for him to follow one of these pursuits. His soul, however, was not in his studies; as the needle to the pole, so his heart turned to Nature. Her storehouse of hidden wealth, her mysteries treasured since creation's dawn, her sphinx face cast over him an irresistible spell. At her feet he bowed. To gain from her clues and hints which might flood light on the great question of the ages, was henceforth to be his mission. In 1845, he discarded his special studies, and gave himself entirely to the investigation of natural history. In 1848, we find him patiently, tirelessly, earnestly searching for new light in the multitudinous forms of life on the banks of the Amazon and Negro rivers, an adventure abounding in great peril, and offering no inducements which to the ordinary mind would compensate for its hardships, to say nothing of its dangers. Here we find him studying the mysteries of life. The torrid sun beats upon his head. Fever threatens him. Serpents, vipers, scorpions, venomous insects, and reptiles seem omnipresent. The flora is charged with poison. Every step taken is fraught with perils. He wavers not. For four years we find this disciple of science dwelling among the Indian tribes of South America, haunting the banks of the rivers, wandering through forest and jungle, collecting specimens of vegetable and animal life which promised to throw light on the great problem he was unravelling. This rare collection was almost entirely lost at sea. In 1852, he returned to England and published his "Travels on the Amazon and Negro Rivers." This work was followed by a scientific treatise entitled "Palm Trees of the Amazon and their Uses." Not satisfied with his investigations he embarked for the Malay Archipelago, where he spent eight years of persistent toil. It was during this time that Charles Darwin was industriously pursuing the same object in foreign lands. Unknown to each other, these great workers were patiently collecting data, and making observations of inestimable value to science, and against which the missiles of their antagonists were to fall powerless. In 1858, Mr. Wallace embodied the result of his investigation with his deductions in a comprehensive essay on "The Tendency of Varieties to depart from their Original Type." This paper was forwarded to Sir Charles Lyell to be read before the Linnean Society in July, 1858. At the same meeting was read Mr. Darwin's paper on "The Tendency of Species to Form Varieties." This is one of the most remarkable coincidences in the history of scientific thought. Two thinkers patiently laboring amid the fertile and fruitful regions of the earth, widely removed from each other, arrive at the same conclusion, forward their views, which are simultaneously read at the annual meeting of a scientific society of which they are members. In the history of invention these coincidences have been very frequent. In scientific discoveries they have not been rare, but I know of no other instance so striking as the above.

On his return from the Malay Archipelago, in 1862, Mr. Wallace brought with him more than eight thousand birds, and over one hun-

dred thousand etymological specimens, the classifying and arranging of which occupied much of his attention for several years. In 1869, he published in two volumes his remarkable scientific work, "The Malay Archipelago." A year later his "Contributions to the Theory of Natural Selection," appeared. This was followed by "Geographical Distribution of Animals," published in 1876. "Tropical Nature," 1887, "Island Life," 1880, and "Land Nationalization," in 1882. But his most recent effort entitled "Darwinism," published in 1889, is unquestionably destined to be his most popular scientific contribution, as here, in the compass of something less than five hundred pages, he outlines the theory of evolution with such force and clearness as to be readily grasped by the popular mind, and while at all times strictly scientific, it abounds in striking illustrations which add to its interest and serve to emphasize the more abstract thoughts. Unlike many scientists whose lives seem to have been absorbed in a special branch of scientific investigation, Dr. Wallace has taken a keen interest in social problems. All questions affecting the welfare of the people have challenged his earnest consideration, and though I cannot agree with many of his views as to the best measures for remedying our present social ills, I recognize in them the single desire to elevate and ennoble humanity, to increase the happiness and minify the poverty and misery of the masses, which is, of course, the aim of all true philanthropists and humanitarians. In regard to another life Dr. Wallace holds decided views. With the commendable spirit of a true scientist, he has exhaustively investigated the remarkable psychic phenomena which the past fifty years have witnessed. In this respect, his course is in bold contrast with that of Professor Huxley, whom Dr. Wallace vainly sought to deeply interest in these questions, but who chose to dismiss the whole subject as unworthy of his time, and who since has volunteered an explanation of some of the phenomena, which, to every psychic investigator, is at once as ridiculously absurd as his attitude toward psychical investigation has been unscientific. Dr. Wallace believes most profoundly in another life. To him this brief span is merely the prelude to a life of eternal progress. In a noteworthy address delivered in 1887, he describes what, in his opinion, would result in the event of materialism being universally accepted by humanity.

"If all men without exception ever come to believe that there is no life beyond this, if children are all brought up to believe that the only happiness they can ever enjoy will be upon this earth, then it seems to me that the condition of man would be altogether hopeless, because there would cease to be any adequate motive for justice, for truth, for unselfishness, and no sufficient reason could be given to the poor man, to the bad man, or to the selfish man, why he should not systematically seek his own personal welfare at the cost of others.

"The well-being of the race in the distant future, set before us by some philosophers, would not certainly influence the majority of men, more especially as the universal teaching of science is, that the entire race, with the world it inhabits, must sooner or later come to an end. The greatest good to the greatest number, that noble ideal of many philosophers, would never be admitted as a motive for action by those who are

seeking their own personal welfare. The scoffing question, What has posterity done for us ? which influences many men even now, would then be thought to justify universal self seeking, utterly regardless of what might happen to those who come afterwards. Even now, notwithstanding the hereditary influences, the religious belief, and religious training in which our characters have been molded, selfishness is far too prevalent. When these influences cease altogether, when under total incredulity, and with no influences whatever, leading men to self-development as a means of permanent happiness, the inevitable result will be that might alone would constitute right, that the weakest would always and inevitably go to the wall, and that the unbridled passions of the strongest and most selfish men would dominate the world. Such a hell upon earth as would thus be brought about, will happily never exist, because it would be founded upon a falsehood, and because there are causes now at work which forbid the disbelief in man's spiritual nature and his continued existence after death."

In "Darwinism" Dr. Wallace boldly takes issue with the materialistic thinkers among his brother evolutionists. So important is his position, and so ably are his views set forth, that I quote at length from the last chapter of the above work, from which it will be observed that he claims the assumption of the materialistic hypothesis more untenable and unworthy of acceptation by scientists, than the higher view of creation which maintains that around the physical world is a spiritual universe, ever acting on matter in conformity with the laws of life.

"The special faculties we have been discussing, clearly point to the existence in man of something which he has not derived from his animal progenitors — something which we may best refer to as being of a spiritual essence or nature, capable of progressive development under favorable conditions. On the hypothesis of this spiritual nature, superadded to the animal nature of man, we are able to understand much that is otherwise mysterious, or unintelligible, in regard to him, especially the enormous influence of ideas, principles, and beliefs, over his whole life and actions. Thus alone we can understand the constancy of the martyr, the unselfishness of the philanthropist, the devotion of the patriot, the enthusiasm of the artist, and the resolute and persevering search of the scientific worker after Nature's secrets. Thus we may perceive that the love of truth, the delight in beauty, the passion for justice, and the thrill of exultation with which we hear of any act of courageous self-sacrifice, are the workings within us of a higher nature, which has not been developed by means of the struggle for material existence.

"It will, no doubt, be urged that the admitted continuity of man's progress from the brute does not admit of the introduction of new causes, and that we have no evidence of the sudden change of nature which such introduction would bring about. The fallacy as to new causes involving any breach of continuity, or any sudden or abrupt change, in the effects, has already been shown; but we will further point out that there are at least three stages in the development of the organic world, when some new cause or power must necessarily have come into action.

"The first stage is the change from the inorganic to organic, when the earliest vegetable cell, or the living protoplasm out of which it arose, first appeared. This is often imputed to a mere increase of complexity of chemical compounds; but increase of complexity with consequent instability, even if we admit that it may have produced

protoplasm as a chemical compound, could certainly not have produced *living* protoplasm — protoplasm which has the power of growth and of reproduction, and of that continuous process of development which has resulted in the marvellous variety and complex organization of the whole vegetable kingdom. There is in all this, something quite beyond and apart from chemical changes, however complex; and it has been well said that the first vegetable cell was a new thing in the world, possessing altogether new powers — that of extracting and fixing carbon from the carbon dioxide of the atmosphere, that of indefinite reproduction, and, still more marvellous, the power of variation, and of reproducing those variations till endless complications of structure and varieties of form have been the result. Here, then, we have indications of a new power at work, which we may term *vitality*, since it gives to certain forms of matter all those characters and properties which constitute life.

"The next stage is still more marvellous, still more completely beyond all possibility of explanation by matter, its laws and forces. It is the introduction of sensation, or consciousness, constituting the fundamental distinction between the animal and vegetable kingdoms. Here all idea of mere complication of structure producing the result is out of the question. We feel it to be altogether preposterous to assume that at a certain stage of complexity of atomic constitution, and as a necessary result of that complexity alone, an *ego* should start into existence, a thing that *feels*, that is conscious of its own existence. Here we have the certainty that something new has arisen, a being whose nascent consciousness has gone on increasing in power and definiteness till it has culminated in the higher animals. No verbal explanation, or attempt at explanation — such as the statement that life is the result of the molecular forces of the protoplasm, or that the whole existing organic universe from the amæba up to man was latent in the fire-mist from which the solar system was developed — can afford any mental satisfaction, or help us in any way to a solution of the mystery.

"The third stage is, as we have seen, the existence in man of a number of his most characteristic and noblest faculties, those which raise him farthest above the brutes, and open up possibilities of almost indefinite advancement. These faculties could not possibly have been developed by means of the same laws which have determined the progressive development of the organic world in general, and also of man's physical organism. These three distinct stages of progress from the inorganic world of matter and motion up to man, point clearly to an unseen universe — to a world of spirit, to which the world of matter is altogether subordinate.

"To this spiritual world we may refer the marvellously complex forces which we know as gravitation, cohesion, chemical force, radiant force, and electricity, without which the material universe could not exist for a moment in its present form, and perhaps not at all, since without these forces, and perhaps others which may be termed atomic, it is doubtful whether matter itself could have any existence. And still more surely can we refer to it, those progressive manifestations of Life in the vegetable, the animal, and man — which we may classify as unconscious, conscious, and intellectual life, and which probably depends upon different degrees of spiritual influx. I have already shown that this involves no necessary infraction of the law of continuity in physical or mental evolution ; whence it follows that any difficulty we may find in discriminating the inorganic from the organic, the lower vegetable from the lower animal organisms, or the higher animals from the lowest types of man, has no bearing at all upon the question. This is to be decided by showing that a change in essential nature [due, probably, to causes of a higher order than those of the material universe] took place at the sev-

eral stages of progress which I have indicated ; a change which may be none the less real because absolutely imperceptible at its point of origin, as is the change that takes place in the curve in which a body is moving when the application of some new force causes the curve to be slightly altered. Those who admit my interpretation of the evidence now adduced — strictly scientific evidence in its appeal to facts, which are clearly what ought *not* to be on the materialistic theory — will be able to accept the spiritual nature of man, as not in any way inconsistent with the theory of evolution, but as dependent on those fundamental laws and causes, which furnish the very materials for evolution to work with. They will also be relieved from the crushing mental burden imposed upon those who — maintaining that we, in common with the rest of Nature, are but products of the blind eternal forces of the universe, and believing also that the time must come when the sun will lose his heat, and all life on the earth necessarily cease — have to contemplate a not very distant future in which all this glorious earth which for untold millions of years has been slowly developing forms of life and beauty, to culminate at last in man, shall be as if it had never existed ; who are compelled to suppose that all the slow growths of our race struggling towards a higher life, all the agony of martyrs, all the groans of victims, all the evil and misery and undeserved suffering of the ages, all the struggles for freedom, all the efforts towards justice, all the aspirations for virtue and the well-being of humanity, shall absolutely vanish, and, 'like the baseless fabric of a vision, leave not a wrack behind.'

"As contrasted with this hopeless and soul-deadening belief, we, who accept the existence of a spiritual world, can look upon the universe as a grand consistent whole, adapted in all its parts to the development of spiritual beings, capable of indefinite life and perfectibility. To us, the whole purpose, the only *raison d'être* of the world — with all its complexities of physical structure, with its grand geological progress, the slow evolution of the vegetable and animal kingdoms, and the ultimate appearance of man — was the development of the human spirit in association with the human body. From the fact that the spirit of man — the man himself — is so developed, we may well believe that this is the only, or at least the best way for its development ; and we may even see in what is usually termed 'evil' on the earth, one of the most efficient means of its growth. For we know that the noblest faculties of man are strengthened and perfected by struggle and effort ; it is by unceasing warfare against physical evils, and in the midst of difficulty and danger that energy, courage, self-reliance, and industry have become the common qualities of the northern races ; it is by the battle with moral evil in all its hydra-headed forms, that the still nobler qualities of justice, and mercy, and humanity, and self-sacrifice have been steadily increasing in the world. Beings thus trained and strengthened by their surroundings, and possessing latent faculties capable of such noble development, are surely destined for a higher and more permanent existence ; and we may confidently believe with our greatest living poet —

> That life is not as idle ore,
> But iron dug from central gloom,
> And heated hot with burning fears,
> And dipt in baths of hissing tears,
> And batter'd with the shocks of doom
> To shape and use.'

"We thus find that the Darwinian theory, even when carried out to its extreme logical conclusion, not only does not oppose, but lends a decided support, to a belief in the spiritual nature of man. It shows us how man's body may have been developed from that of a lower animal form under the law of natural selection ; but it also teaches us, that we pos-

sess intellectual and moral faculties, which could not have been so developed, but must have had another origin; and for this origin we can only find an adequate cause in the unseen universe of Spirit."

Such is the profound conviction of one of the foremost living naturalists; a man whose life has been devoted to the investigation, demonstration, and elucidation of truth on a strictly scientific basis. It is seldom we meet with a scientist who has thought deeply along so many channels, and what is perhaps still more remarkable, the three subjects to which he has given his profoundest thought,—evolution, psychic and spiritual research, and the social and industrial problems, are the three themes which are challenging the best thought of our age to-day.