

ALFRED RUSSEL WALLACE, LL. D.

By E. D. COPE.

ALFRED RUSSEL WALLACE was born at Usk, Monmouthshire, in England, in the year 1822, and he is therefore at present in his sixty-ninth year. As I saw Mr. Wallace in London in 1863, and in America in 1889, I can speak of his appearance "from autopsy." He is above medium height, not of stout build, and with a slight stoop of the shoulders. His head is neither long nor short, and the face is rather round than long. The forehead is fuller at the base than at the summit, and prominent eyebrows overhang eyes which have a vivacious twinkle. The mouth is large and amiable, and is surrounded by a full beard. The complexion is pale, and the expression is a combination of *bonhomie* and open honesty of character.

Dr. Wallace's prominence as a teacher of biology is not due to original researches in paleontology or embryology, or extended papers in comparative anatomy; but it rests on his extensive investigation of living beings in their mutual relations in actual life. This science, which has been termed hexicology, owes its most important development to his labors, and to those of his contemporary, Charles Darwin. It is only possible to pursue it on an extended scale by the observation of Nature under many aspects in many regions, and it is therefore desirable that its cultivators shall be travelers. Such have been both Mr. Darwin and Mr. Wallace. Mr. Wallace's explorations have been principally in the tropics of both hemispheres. In 1848 he visited the Amazon and some of its tributaries, where he remained four years. He made extensive collections in zoölogy during this time, but they were most unfortunately burned in the vessel in which he was making the return voyage. He published an account of his observations in a popular book, which I read as a boy with great interest. He also published a brief account of the palms of the Amazons.

In 1854 Dr. Wallace visited the Malaysian Islands, where he remained eight years. The collections and observations which he made during this exploration gave him occupation

for many years after his return. His collections were especially important in ornithology and entomology, and his observations brought to light many new facts in the life-history of animals of all branches. Among a multitude of new species discovered by him I only mention now the beautiful and chastely colored paradise-bird from New Guinea, the *Semioptera wallacei* Scl. When on the Amazon, Wallace had the opportunity of verifying and extending the observations of Bates on the remarkable phenomenon of mimetic analogy presented by the *Lepidoptera* of that region. In Malaysia he discovered many equally striking examples of the same thing. He observed not only cases of mimetism between living species of insects, but also wonderful mimicry of inanimate objects and plants by living animals. His studies of the variations of species by this time led him to formulate a theory to account for their origin and persistence identical with that given to the world by Mr. Darwin under the name of Natural Selection.

Dr. Wallace's first statement of this theory was contained in a letter to Mr. Darwin, written at Ternate in 1858. This letter was afterwards published in the Proceedings of the Linnæan Society of London for 1859 (read August, 1858), under the title *On the Tendency of Varieties to depart indefinitely from the Original Type*, in conjunction with two papers on the same subject by Mr. Darwin. The letter was shown to Sir Charles Lyell and to Dr. Joseph D. Hooker, who were familiar with the views of Mr. Darwin on the same subject. Mr. Darwin had written a paper as early as 1844, in which essentially the same views were propounded, which had been read to Dr. Hooker, but which had never been published. A letter containing the same general views had been also written by Mr. Darwin to Dr. Asa Gray in 1857. These two papers were published in connection with Mr. Wallace's letter in the Proceedings of the Linnæan Society, as above mentioned, by Sir Charles Lyell and Dr. J. D. Hooker. Dr. Wallace's paper endeavors to demonstrate the evolution of species in ordinary descent by the action of two factors: First, that species tend naturally to produce varieties or variations of character; and, second, that if any of these variations or varieties present superior advantages in the struggle for existence over those possessed by its parent, it will separate or replace the latter, thus accomplishing the introduction of a new form or species in place of the old one. He cites among his various illustrations the

following: "Even the peculiar colors of many animals, especially insects so closely resembling the soil or the leaves or trunks on which they habitually reside, are explained on the same principle, for though in the course of ages varieties of many tints may have occurred, yet those races having colors best adapted for concealment from their enemies would inevitably survive the longest."

The way in which Mr. Darwin reached the same result in his letter of 1844, above mentioned, is slightly different only in being a little more comprehensive, as it includes one more factor—viz., the necessarily enormous increase of animals and plants by reproduction and the consequent severity of the struggle for existence. He applies the Malthusian idea to the lower creation, and shows how that any one of the numerous species which exist would soon fill the earth were not checks present on every hand which only permit the survival of those individuals which possess exceptional facilities for success in the pursuit of subsistence. In this way profitable variations of structure have survived and been perpetuated; in other words, new species have originated and continued. The two papers by Drs. Darwin and Wallace embrace all the factors involved in the process of natural selection. Later elucidation of the doctrines of these two able expositors, and by others subsequently, have convinced thoughtful persons that it is an expression of a great fact of the evolution of life. Its acceptance has been general, and the impetus given to research and to thought has been great.

In the acceptance of the doctrine of natural selection the public has often confused it with the general doctrine of the evolution of animals by descent, of which natural selection is an explanation. The general doctrine of descent is as old as human thought, but it awaited the expositions of Darwin and Wallace before receiving general acceptance. Even the authority of Lamarck, who formulated it a half-century previously, was not sufficient to gain credence for it. Lamarck's principal explanation of the process, the change of structure through use and disuse, lacked the necessary evidence, and, although he taught the law of natural selection as a corollary, it did not compel assent as did the masterly presentation of Darwin and Wallace.

Dr. Wallace's first book on evolution was published in 1870, and was entitled *Contributions to the Theory of Natural Selection*. This work contains the germs of all of his

subsequent works, so I give a list of the contents by titles of the chapters :

I. On Geographical and Geological Distribution.

II. On the Tendency of Varieties to depart indefinitely from the Original Type. This is the essay already referred to as having been published in the Proceedings of the Linnean Society for 1859.

III. Protective and Mimetic Coloration (reprinted from the Westminster Review for July, 1857).

IV. The Malayan Papilionidæ as illustrative of Natural Selection (originally published in 1844).

V. Instinct acquired by Education.

VI. On Birds' Nests (published in 1867).

VII. A Theory of Birds' Nests (published in 1868).

VIII. Creation by Law (published in 1867).

IX. Development of Human Races under the Law of Natural Selection (published in 1864).

X. The Limits of Natural Selection as applied to Man.

These chapters state the following positions: In the second it is asserted that Lamarck's hypothesis has been "repeatedly and easily refuted." He says: "The powerful retractile talons of the falcon and cat tribes have not been produced or increased by the volition of these animals, but, among the different varieties which occurred in the earlier and less highly organized forms of these groups, those always survived longest which had the greatest facilities for seizing their prey" (page 2). In the third chapter he shows that it is chiefly the females of the insects of the *Lepidoptera* and of the *Phasmidæ* which display mimetism. He cites the females of certain birds as an example of protective coloration. Their plain tints conceal them from the observation of enemies, while the males are exposed, owing to their lighter colors. He supposes that brightly colored females have been exterminated, and, their brood being lost, species which possess plainly colored females have survived. In the fourth chapter Dr. Wallace describes two kinds of variation which he has observed in the Malaysian *Lepidoptera*. The one is simple variability of both sexes; the other is polymorphism, where a species embraces one type of male with several types of females. The same phenomenon was observed by Trimen in South Africa. In the fifth chapter the origin of instincts by education is discussed in the same general way as has been done by Herbert Spencer, but without a statement of its bearing on the evolution of mind,

as has been elucidated by the latter philosopher. In his chapters sixth and seventh Wallace discusses the architecture of birds' nests with reference to the question of the protective coloration of the females. He divides nests into two types—those where the eggs and young are hidden, and those where they are exposed. He believes that the females of the first class are brightly colored, and those that use the second are protected by plain colors. He cites a few exceptions to this rule, and a good many others exist, among North American birds at least.

In the seventh chapter Wallace enters on the philosophical aspects of evolution. He criticises the Duke of Argyll's *Reign of Law*, and affirms that evolution is as much an expression of law as is creationism. In his ninth chapter he teaches that the evolution of man has not been under the conditions of natural selection. He says that "from the time that social and sympathetic feelings came into active exercise, man's physical form and structure ceased to be molded by natural selection. But his mind would become subject to those influences which his body had escaped; every slight variation in his mental and moral nature which should enable him better to guard against adverse circumstances and to combine for mutual comfort and protection would be preserved and accumulated. The better and higher specimens of one race would therefore increase and spread, and the lower and more brutal would give way and successively die out, and that rapid advancement of mental organization would occur which has raised the very lowest races of men so far above the brutes." In his tenth chapter Mr. Wallace goes on to say that he believes that there are limits to the law of natural selection as applied to the mental development of man. "We can trace the action of some unknown and higher law beyond and independent of all those laws of which we have any knowledge. We can trace this in the two most important points—viz., the origin of sensation, or consciousness, and the origin of morality. Even in the case of some physical characters, natural selection does not offer an explanation. Such are: (1) The large size of the brains of savages as compared with those of apes; (2) the absence of hair over the greater part of the human body; (3) the perfect adaptation of the feet and hands. Finally, he concludes by adopting the idea of Boscovich that matter consists of centers of force only, and, second, that all force is will force.

In 1878 Dr. Wallace published his two volumes *On the Geographical Distribution of Animals*. His original researches on the distribution of animals in the Malaysian Archipelago furnished the starting point of this work. It is an excellent general exposition of the subject, which has, however, from the nature of the case, become in some points superannuated. The systematic relations of many groups of animals are now better understood than they were then, and paleontology has made great advances beyond the state of knowledge recorded in this work. In 1878 the work of a popular character on *Tropical Nature* appeared. His book on *Island Life* was published in 1880. Here we have a discussion of the faunæ of islands, a very fertile subject in the evidence it contributes to questions of distribution in past and present time, and in the restricted, and therefore more comprehensible, fields which it offers for the solution of questions of subsistence, selection, etc. He here brings into final order the evidence as to the primitive separation of the Oriental and Australian faunæ which now approach each other so closely in the Malaysian Islands. He found during his residence in Malaysia that the islands of the respective groups were separated from each other by comparatively shallow seas, while a deep channel divides the two groups as a whole from each other. This channel, which passes between Celebes and Borneo at the northwest, and Lombok and Bally at the southwest, is known as Wallace's Channel. The fauna of Celebes is, however, somewhat intermediate in possessing some types of both faunæ.

In 1889 Dr. Wallace's last work, *Darwinism*, appeared. In this book he summarizes the facts and inferences which bear on evolution. As before, natural selection is regarded as the leading factor in structural evolution. The subjects treated of are arranged in the following order: Chapter I. What are Species, and what is meant by their Origin. II. The Struggle for Existence. III. The Variability of Species in a State of Nature. IV. Variations of Domestic Animals and Cultivated Plants. V. Natural Selection by Variation and Survival of the Fittest. VI. Difficulties and Objections. VII. Infertility of Crosses between Distinct Species, and the Usual Sterility of Hybrids. VIII. The Origin and Uses of Color in Animals. IX. Warning Coloration and Mimicry. X. Colors and Ornaments Characteristic of Sex. XI. Special Colors of Plants, their Origin and Purpose. XII. The Geographical Distribution

of Organisms. XIII. The Geological Evidence of Evolution. XIV. Fundamental Problems in Relation to Variation and Heredity. XV. Darwinism as applied to Man. XVI. Criticisms. XVII. Forces other than Natural Selection.

The scope of Darwinism is wider than that of any of Wallace's previous books, and he gives attention to the voluminous literature which had grown up during the interval which had elapsed since his first general synopsis published in 1870. The most important part of the book is the large portion which is devoted to the nature and uses of colors in animals and plants. In this field Wallace's original contributions both to fact and theory are very interesting and valuable. His chapter on the geological (*i. e.*, paleontological) evidence of evolution was hardly up to the times, as the American work had not sufficiently attracted his attention at the time of his writing. In his criticisms of Spencer, Cope, Semper, and Geddes he denies the efficacy of the Lamarckian factors use and disuse, and the direct effect of the environment on organic structure, but accounts for all variations in the latter by natural selection. Thus Cope had endeavored to explain the origin of the divergence of the diparthrous ungulate mammalia by supposing that the even-toed line (*Artiodactyla*) were produced by walking in muddy ground, which spreads the toes equally in all directions, while the odd-toed (*Perissodactyla*) have descended from forms that walked on dry ground, so that the stimulus of impact and strain was felt by the longest toe, which was accordingly developed at the expense of the others, thus producing the horse. Dr. Wallace says that such an explanation is not proved, and is unnecessary, since it is evident that it was only necessary for variation in these two directions to have appeared to have been at once taken advantage of by natural selection. The odd-toed type, being best adapted for progress on hard ground, would survive, and the even-toed be eliminated; while the reverse process would take place among the types that inhabited soft places. To the general proposition involved in this explanation I will return; but will only say now, in passing, that Dr. Wallace does not thus explain the origin of the two variations in question; nor is it certain that, having once originated, the even-toed is not quite as effective as the odd-toed for rapid progress on hard ground.

In his Chapter XV, Wallace again expresses his dissatisfaction with natural selection as an explanation of the

origin of the human mind; and from this standpoint he takes a retrospect of the forces of creation in general. He says: "These three distinct stages (life, consciousness, and intellect) 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 marvelously complex forces which we know as gravitation, cohesion, chemical force, radiant force, and electricity, without which the material universe would 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 and the animal, and man, which we may classify as unconscious consciousness and intellectual life, and which probably depend upon different degrees of spiritual influx. I have 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 organic from the inorganic, the lower vegetable from the lower animal organisms, or the higher animals from the lowest types of man, has no bearing on 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 several 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 which takes place in the curve in which a body is moving where the application of some new force causes the curve to be slightly altered."

Dr. Wallace, like other lovers of his kind, has interested himself in some questions of political economy, and has written on Land Nationalization (1882) and on Bad Times, an Essay on the Depression of Trade (1885). He also wrote a book in opposition to vaccination in 1885. He is known to be a believer in the verity of some of the phenomena of Spiritualism or Spiritism, and was a coadjutor of Prof. Crookes in the conduct of some of his experiments in this field. Without being a Swedenborgian, he is an adherent of one of the leading tenets of the founder of that body—viz., of the influx, upon man at least, of an influence from without him, from a personal spiritual source.

In reviewing the work of Dr. Wallace one can assert that it furnishes an admirable illustration of the intelligent spirit which is rife in the Indo-European of the nineteenth century. The desire and the determination to know is its actuating motive, and the good of mankind is its ostensible end. It is sustained by the faith that knowledge can not harm us, but that it is, on the other hand, necessary for our safe conduct through time, both as individuals and as a race. The labors undertaken with this end in view have been many and arduous, and Dr. Wallace's illustrate this aspect of the times as much as those of any other man. His work is a life labor conducted with persevering consistency to attain a definite result. His life is an excellent illustration of his own doctrine, that all force is will-force. The utility of his life is self-evident, and the effects of it on human thought, and therefore on human action, will remain as long as mankind thinks and acts.

As regards the position occupied by Dr. Wallace among the architects of our knowledge of the doctrine of evolution, I do not hesitate to say that, like that of his great coadjutor Darwin, he has occupied himself with a part only of the work. Like the builder engaged on one side of a building, he has been so attracted and impressed by the rich materials ready to his hand that he has not given heed to the other side of the edifice; and the higher he has builded, the less has he been able to see the hidden portions. This is natural, and perhaps beneficial, for had he seen the whole elevation in a mental *coup d'œil*, he might not have worked so well at his own nearest portion, and he might have been distracted by the multiplicity of his thoughts and ambitions. But it is certain that admirable powers of observation do not always coexist with the highest logical capacity. Whether this is because of the complementary relation of parts of the mental organism, or because constant occupation with the arrangement of sense impressions excludes the present activity of logical reflection, and *vice versa*, we do not know; but the two faculties are often dissociated in human minds.

It seems to have very rarely occurred to Mr. Darwin, and still more rarely to Dr. Wallace, to reflect on, or at least to discuss, the question of the origin of the variations concerning which they have said so much and so convincingly. In the writings of both we frequently meet with the expression that such and such a character has been "caused by natural selection." So habitual did this idea become

that it is now the creed of a scientific school of the countrymen of Darwin and Wallace, and it has influenced the thought of English-speaking people everywhere. That natural selection is not the primary but a secondary factor in evolution it has been my aim to show in various publications since 1868, and an active school of evolutionists in America, England, and Germany occupies this position. In Germany, Nägeli and Eimer; in England, Spencer, Henslow, Turner, and Geddes; and in America, Hyatt, Jackson, Packard, Osborn, Ryder, Sharp, and Dall, have made important contributions to this doctrine; and as, in the case of most of these writers, their doctrine includes the essential of the position of Lamarck, the term Neolamarckian is appropriate to this school and to its opinions. To the opposite school the term Neodarwinian or Postdarwinian has been applied.

The failure of the Neodarwinian school to enter into a consideration of the origin of variation has precluded them from researches into the mechanical causes of modifications of structure, whether proceeding from the movements of the organism in relation to its environment, or whether due to the action of the environment on the organism. Yet they have occasionally slipped into Lamarckian explanations of the structures and colors of animals. Lankester has admitted that the spiral coil of the gastropod mollusca was due to an unsymmetrical position of the shell of the animal during growth. Wallace has suggested that the rotation of the eye of the flat-fish from one side of the head to the other was due to the effort of the animal to direct that eye upward, as the body gradually acquired the habit of lying and swimming on one side. Poulton ascribes the imitative colors of the pupæ of certain butterflies to the effect of the colors of the environment on the nervous organism of the caterpillar when about to change. But these explanations have been abandoned by Lankester and Wallace as implying the insufficiency of the action of natural selection to produce the observed results.

The opinions of Weissmann lend support to the Neodarwinians. This author declares that acquired characters can not be inherited, so that if use and disuse should produce modifications in the structure of adult animals, they could not be transmitted to their descendants. If this be true, the Lamarckian position is founded on error. This doctrine is accepted by Wallace in his last work (*Darwinism*).

Weissmann and the other Postdarwinians, however, admit the acquisition and inheritance of what they call "congenital" characters, which appear only in the reproductive elements, and which they distinguish broadly from the characters which may be acquired by the body in general through use and disuse, and which they call "somatic characters." They endeavor to prove their hypothesis that the latter are not inherited by endeavoring to reproduce mutilations, such as by the breeding of mice from which the tails have been amputated, etc. It is, however, evident that the distinction between "congenital" and "somatic" acquired characters does not exist, since evolution shows that all characters have been acquired at some period of time, and that the only difference in such characters is their greater or less antiquity. The non-inheritance of mutilations illustrates the principle that the general relations of the organism contribute to the production of a change of character, and that no isolated and sporadic, and therefore superficial, change affects the reproductive elements sufficiently to be transmitted. Paleontology shows that the causes which have been sufficient to produce inheritable changes of structure have been in daily or hourly operation for long ages; and that the results have been the gradual evolution of mechanisms especially adapted to the needs of their possessors in their relations to the environment.

We rise to another stage of the subject if, when we grant that the movements of the organism have produced the changes observed and which constitute progressive evolution (and *vice versa*), we seek for the causes that underlie animal motion. The inference on the part of those who observe living animals is that their conscious states influence their movements. To this two answers are made. One of these is by a school of physiologists who declare that a conscious (i. e., a mental) state can not influence (i. e., control or direct) the motion of a material body. The other objection is that animal movements are not nearly always consciously performed. To the latter objection it is replied that unconscious (automatic or reflex) acts are simply the product of education during conscious states, and that a designed act could not have originated in any other way. The first objection—that consciousness can not affect motion of material bodies—is a theoretical inference based on the supposed impossibility of violating the law of the conservation of energy. It is a special statement of a general principle—viz.,

that mind can not control matter. An equally necessary conclusion is that matter can not control mind. This is not the place to enter into a discussion of this broad question, so I will only refer to Dr. Wallace's position on this important subject.

Dr. Wallace has perceived the necessity of some agency other than mechanical energy to account for the intelligence displayed by animals and men. As he does not admit the Lamarckian idea of use and disuse, he finds no direct use for animal consciousness in the premises. He criticises the position of the writer of the present paper (Darwinism, Chapter XIV), that consciousness, and consequently intelligence, have been the determining causes of animal movements. He well remarks that since evolution has produced the vegetable kingdom and the lowest animals, intelligence can not well have been a factor, and that, this being the case, it is not necessary to suppose it to have been so in the case of the higher animals, as one rule must have governed all cases at the basis. Dr. Wallace does not appear to have taken into consideration the fact, however, that the simplest sensations belong to the department of mind, and that it is highly probable that the lowest animals and their almost indistinguishable vegetable allies give evidence of such rudimentary sense-perception; and sensation and memory are sufficient for the evolution of mind. The vegetable kingdom displays for the most part characters of degeneracy, its entire "efficient" cause being the reproductive function, which has speedily become automatic and unconscious.

The rational mind which has not surrendered to the idea of fortuity seeks some explanation of the ever-increasing intelligence found intimately associated with the evolution of animals. Prof. Haeckel conceived his theory of the "plastidule soul" to meet the difficulty; but the idea is indefinite, and would not probably have been entertained by its distinguished author if he had followed up the subject of animal psychology. It still remains in the limbo of unrealized fancies. But Dr. Wallace cuts the Gordian knot by the introduction of the idea of "influx" of a mind-energy from without. I can say of this proposition that it appears to be an unnecessary interjection into an otherwise continuous operation of known and visible causes. The presence of sensation and memory in very low animals is too well assured to render any external influence necessary except that of the environment; and the process of education is well

known to produce types of energy which may run on in their unvarying automatic courses to eternity for aught that we know without betraying any indication of consciousness except that their nature can only be explained on the supposition that consciousness was present at their inception. It is also a self-evident proposition that the automatization of energy must be the cause of the *non-adaptability* of an organism to changes in the environment, and therefore the cause of the destruction or degeneracy of organisms. The opposite proposition is equally self-evident—viz., that consciousness or sensation is a guarantee of persistent life and *adaptability* to changed environment, and therefore of progressive evolution.

In conclusion, I present a table of the alternative positions held by opposite schools of evolutionists, which correspond in the main with the Neolamarckian and Neodarwinian. Although particular men may not hold all the affirmations of either side, they form two distinct and consistent bodies of doctrine.

NEOLAMARCKIAN.

1. Variations are not promiscuous, but definite.
2. Variations are caused by the interaction of the organic being and its environment.
3. Acquired variations may be inherited.
4. Variations survive directly as they are adapted to changing environments.
5. Cause of inherited variation is physical and mechanical interaction of being and environment.
6. Movements of the organism are caused or directed by sensation and other conscious states.
7. Conscious experience has developed habitual movements of the body.
8. The rational mind is developed by experience—i. e., memory and classification.

NEODARWINIAN.

1. Variations are promiscuous or multifarious.
2. Variations are "congenital" and are not caused by the interaction with the environment.
3. Acquired variations can not be inherited.
4. Variations survive directly as they are adapted to the environment.
5. Cause of inherited variation is unknown or is the mingling of ♂ and ♀ characters in reproduction.
6. Movements of organism are not caused by sensation or conscious states, but are a survival by natural selection from multifarious movements.
7. Conscious experience has developed mental habits only.
8. The rational mind is developed by natural selection from multifarious mental activities.

ABSTRACT OF THE DISCUSSION.**DR. MARTIN L. HOLBROOK :**

In listening to the able and interesting lecture of Prof. Cope, I could not help wishing that he had given us more detailed information about the personal life of Mr. Wallace. Knowledge of the personal characteristics of a writer often greatly helps us to an understanding of his thought and to a due appreciation of the value of his opinions. From a friend who knows Mr. Wallace well, I have obtained some facts concerning him which may be of interest. This friend describes him as a tall man, of distinguished appearance, and excellent balance of temperament. He is a good listener, but not gifted in conversation. When he speaks, however, his words carry conviction, on account of his evident sincerity and intelligence. Mr. Wallace became a spiritualist, as Dr. Cope has intimated, through the influence of a very intimate friend, who is possessed of mediumistic powers, so called, and he is now as firm as a rock in his belief in the general truth of the spiritualistic doctrine. As a scientific observer, he was as accurate and painstaking as Mr. Darwin, and, with him, is entitled to the honor of the discovery of the law of natural selection.

EX-SURROGATE ABRAM H. DAILEY :

I think I was invited here this evening under a misapprehension. I have no personal acquaintance with Mr. Wallace. I only know him through his writings. I have fallen on a similar line of investigation in the phenomena of spirit-communication with Dr. Wallace, and have come to similar conclusions. It is greatly to be regretted that a condition of society exists which deprecates such investigations, and that it requires moral heroism in a man like Mr. Wallace to proclaim his belief in the spiritualistic phenomena. I have no reason to doubt that he has exercised the same care in these investigations that he has in his biological studies.

MR. THADDEUS B. WAKEMAN :

The lecture of the evening is an able and valuable contribution to the literature of evolution. In his personal character Mr. Wallace stands as high as Darwin. Evolutionists have nothing to apologize for in the characters of the leading advocates of this doctrine. All men, however, have their limitations. Darwin was a great observer

and discoverer, but not a theorist or philosopher. The development of a consistent philosophy based upon the facts of evolution was impossible to him. Mr. Wallace is more inclined to philosophical speculations, but he has never been trained in the scientific study of mind, and has therefore fallen a prey to the false theories and conclusions of spiritism. This is his limitation. For myself, I believe that Prof. Haeckel, about whom I am hereafter to speak to you, stands high and clear above all the other advocates of this doctrine as a philosophical evolutionist.

DR. LEWIS G. JANES :

It is interesting to note that the subject of this lecture has considered the doctrine of evolution in its higher aspects—as related to sociology and religion—as well as in its merely physical relations. In biology Dr. Wallace is more of a Darwinian than was Mr. Darwin himself. He attributes to natural selection alone many of those alterations in the structure and coloration of birds and animals which Darwin attributed to sexual selection. In reading his latest work, soon after its publication, under the influence of his cogent arguments—backed, as they were, by a strong array of facts, and charmed by his delightfully perspicuous style—it seemed to me that his conclusions in most of the cases cited by him were fully justified. At all events, his arguments must be squarely met by a fair appeal to the facts, in order to invalidate their conclusions. In regard to the question of heredity, however, and the effects of use and disuse in determining variations, I can not help thinking his judgment is at fault. He adopts the doctrine of Dr. Weissmann, that acquired characters are not inherited; but this doctrine has been recently and, as it appears to me, successfully combated by Prof. Theodor Eimer, and the facts with which I am familiar seem to be decidedly against it. Nevertheless, the judgment of so good an observer as Mr. Wallace is entitled to most respectful consideration.

PROF. COPE thanked the audience for their attention and briefly closed the discussion.