QH 367

.P26

Copy 2

Proofs of Evolution

FT MEADE
GenColl

LIBRARY OF CONGRESS.

QH 367
Chap. .... Copyright No. ....

Shelf P26
copy 2

UNITED STATES OF AMERICA.

PROOFS OF EVOLUTION

never entered

PROOFS OF EVOLUTION

One of a Series of Popular Lectures before
the Brooklyn Ethical Association

BY

NELSON C. PARSHALL

"One of the most systematic, concise and comprehensive presentations in popular form of the foundation and theory of evolution."—*Public Opinion*.

FIFTH THOUSAND

CHICAGO
CHARLES H. KERR AND COMPANY

1892

QH367

P26

copy 2

COPYRIGHT BY
JAMES H. WEST,
1889.

~~QH367~~
~~P26~~

CONTENTS.

	PAGE
I. The Growth of Evolutionary Thought, . . .	9
II. Practical Benefits of the Evolution Theory, . .	12
III. The Four Great Factors of Evolution, . . .	16
IV. Proofs from Geology, ...	19
V. Proofs from Morphology, ...	21
VI. Proofs from Embryology, ...	31
VII. Proofs from Metamorphosis, ...	34
VIII. Proofs from Rudimentary Organs, ...	36
IX. Proofs from Geographical Distribution, . . .	40
X. Proofs from Discovered Links, ...	44
XI. Proofs from Artificial Breeding, ...	52
XII. Proofs from Reversion, ...	55
XIII. Proofs from Mimicry, ...	58
XIV. Spontaneous Generation, ...	60
XV. A Summary of Evidence, ...	63
XVI. Language and the Moral Sense, ...	68
XVII. Conclusion, ...	69

*The eye reads omens where it goes,
And speaks all languages the rose;
And, striving to be man, the worm
Mounts through all the spires of form.*

—*Nature*, i., 7.

THE fossil strata show us that Nature began with rudimental forms, and rose to the more complex as fast as the earth was fit for their dwelling-place; and that the lower perish as the higher appear. Very few of our race can be said to be yet finished men. We still carry sticking to us some remains of the preceding inferior quadruped organization. . . The age of the quadruped is to go out, —the age of the brain and of the heart is to come in. And if one shall read the future of the race hinted in the organic effort of Nature to mount and meliorate, and the corresponding impulse to the Better in the human being, we shall dare affirm that there is nothing he will not overcome and convert, until at last culture shall absorb the chaos and gehenna. He will convert the Furies into Muses and the hells into benefit.—*Culture*.

—RALPH WALDO EMERSON.

COLLATERAL READINGS SUGGESTED

IN CONNECTION WITH ESSAY

Darwin's *Origin of Species*; Haeckel's *History of Creation*, and *Evolution of Man*; Spencer's *Biology*; Fiske's *Cosmic Philosophy* and *Excursions of an Evolutionist*; Huxley's *Letters on Evolution* and *Critiques and Addresses*; Romanes' *Scientific Evidences of Organic Evolution*; Wallace and Dyer's *The Distribution of Life*; Schmidt's *Doctrine of Descent and Darwinism*; Cazelle's *Outline of the Evolution Philosophy*; Professor Morse's *Presidential Address* before the American Association for the Advancement of Science, 1887.

PROOFS OF EVOLUTION

I.

THE GROWTH OF EVOLUTIONARY THOUGHT.

EMERSON says: "Beware when the great God lets loose a thinker on this planet. Then all things are at risk." This laconic saying has been more than verified within the last thirty years. The thinkers have been holding high carnival;—and all about a little protoplasmic cell that none of them could see with the naked eye.

Two great questions have always been before the world: one, as to the beginning of all things; the other, as to the end of all things. Concerning these two problems, many sacred books have been written, from which a dozen great religious systems have sprung, all setting forth, more or less minutely, theories of the genesis of mind and matter. The explanations thus given, though crude and barbarous in many of their features,

have been generally accepted, and the races of men have shaped their earthly careers in accordance therewith. Now and then a splendid soul arose and denied the truth of these assumed revelations; but he rarely lived to repeat the denial.

For ages men were content merely to know how to utilize the simplest forces of Nature, to learn how to do the commonest things, and to join in communities for pleasure and protection. They thought all things were made out of hand by a Supreme Architect who directed momentarily and minutely all human affairs. Fear and wonder made all their gods, and love and hope supplied them with the beautiful belief in immortality.

Although the martyrs of truth fell one by one, each left a germinal thought behind. Only within the present generation has it become safe and reputable to think. Hardly is this even now the exact truth; for "The Descent of Man" was at first hailed with good-natured laughter and gentle derision; it was a good drawing-room joke at the expense of the monkey-tribe. Even at the present moment, the vast majority of the people smile broadly whenever the subject of man's evolutionary origin is seriously mentioned. Comparatively

few as yet accept all that is implied in the doctrine of Evolution. Nevertheless, it is bound up in one way or other with nearly every branch of human knowledge. The word is in every mouth. The fact connects itself with every known phenomenon. The greatest foe to the development theory has naturally been the church; because if Evolution is true, theology must be reconstructed in accordance with the principle of the supremacy of law and the impossibility of its violation by the intrusion of miracle. Not until there are more Scientific and Ethical Associations, and not until schools and colleges teach the doctrine of Evolution, will it become imbedded in the thought and life of the masses.

II.

THE PRACTICAL BENEFITS OF THE EVOLUTION THEORY.

It may be, and often has been, asked, "Of what use is all this knowledge? What is the practical benefit of believing that man began life as a Moneron, and by strict attention to business has worked himself up to his present high estate—'the paragon of animals'?" In the first place, all this is worth knowing for truth's own sake, since every truth contains the germ of good, and wherever it leads, all may safely follow. But the practical benefit which the knowledge of Evolution conveys, influences man in all relations of life, as an individual and as a member of society. First of all, it teaches him the great lesson of reliance upon law—that all things are the result of growth and development; that the present is the child of the past, the simple the germ of the complex. It teaches the impossibility of the fortuitous and the miraculous,—that if we expect effects, we must set in motion adequate causes; that to live wisely

and well, we must adjust ourselves to the natural and rational.

While it does not take away one rational hope, Evolution sweeps into oblivion all the childish fables of the past ; it points to a new heaven and a new earth ; it bids us awake from our pretty dream of the supernatural, and work in, with and through Nature, if we would make the wilderness of woe and wrong to blossom as the rose. It has unified all science and given learning a new force and meaning. It has added vastly to the sum of knowledge, and to the aggregate of human happiness.

In all its branches and bearings, it directly tends to enlarge and intensify human love and sympathy, and so stimulates the forces that lead to industry and thrift, and on to the highest plane of moral well-being.

It teaches the principles of adjustment and harmony ; it bids us always to take thought for the morrow, and proclaims that love and labor united constitute the "divinity that shapes our ends." It will make the world more generous, kind, and charitable ; more patient, brave and true ; more humble, gentle, and unselfish ; more

noble, virtuous and patriotic. It will do all this because it asserts the great law of mutual duty. Evolution affirms the survival of the fittest. It prophesies even better things to come, than those which we now know. It points toward an ideal of perfection. Its flower and fruitage in life is moral grandeur.

Admitting its scope and possibilities, as thus portrayed, we are now at the threshold of the vital question, "Is Evolution true?" For nothing false can be a permanent good. This question must be answered briefly and imperfectly; for an hour gives time barely to mention the various phases of the great theme. We are compelled to take a hasty view of the broad field, touching only the mountain-peaks in the line of proof which establishes the theory of Evolution.

What is Evolution? A late writer has tersely defined it as follows: "Evolution is continuous, progressive change, according to certain laws, and by means of resident forces." Evolution is simply growth and change, governed by fixed laws. Its corner-stone is *continuity*.

The essayists who have preceded me have ex-

---

plained to you Solar and Planetary Evolution, as also the Evolution of the Earth as a whole, of Vegetal and Animal Life, of Mind, of Man, of Society, Theology and Morals.* It is in the field of Biology, however, that the proofs of Evolution are most abundant and conclusive. To this line of proof I shall mainly confine my attention. But before proceeding to details, it may be well to point out the four great factors of Evolution, on which the entire theory rests.

---

* See "EVOLUTION: Popular Lectures and Discussions before the Brooklyn Ethical Association." One vol., 408 pages, illustrated, complete index, cloth, \$2.00. Boston: James H. West, Publisher.

III.

THE FOUR GREAT FACTORS OF EVOLUTION.

THESE are (1) The influence of Environment ; (2) The increased use or disuse of organs ; (3) Natural Selection, or Survival of the Fittest ; and (4) Sexual Selection. The two former are accredited to Lamarck and others, but the two latter are wholly Darwinian ; and running through all is the potent influence of heredity.

A change in environment effects a corresponding change in functional activities, which leads to structural modification. Common observation and experience show us the effect of the use or disuse of an organ or part. This is likewise observable in determining the greater or less acuteness and activity of all the senses. An organ lying dormant during many generations will gradually atrophy, and appear as a rudiment, finally vanishing altogether. Fishes and animals dwelling in underground caves into which no light enters, are sightless, as they have no use for eyes. They have

lost them by disuse. The wonderful development of the gymnast and athlete is achieved by intensified use of the muscular system. If use or disuse is continued from generation to generation, heredity will transmit the result.

Natural Selection, or Survival of the Fittest, grows out of the struggle for self-preservation. It is based on the law of hunger. It develops strength, cunning, or agility. It is an enemy to the weak and poorly conditioned. We see this principle exemplified every day in the struggle for supremacy among individuals, communities, nations, and races. The strongest and best-favored survive; the weakest perish.

Sexual Selection is not concerned with hunger, but with beauty and the desire for offspring. As well stated by Prof. LeConte, "In Natural Selection there is a struggle of all for food, or means of living. In Sexual Selection there is a struggle among the males for the possession of the females and the means of procreation. The one is related to the nutritive appetite, the other, to the sexual appetite."

In animal life, Natural Selection most obtains among mammals; sexual selection is more pre-

dominant among birds, those having the most beautiful plumage, or sweetest songs, winning the choicest mates. The former fight for existence; the latter, like the warriors bold of the Middle Ages, battle for love. This warfare is in the world to-day wherever there are life and movement. These principles of evolution are still everywhere operating. Heredity preserves these jewels of descent, without which we would go back to "chaos and old night."

IV.

PROOFS FROM GEOLOGY.

AMONG the strongest proofs of Universal development, are those drawn from geological study. The earth has entombed all organic forms that have ever lived, and awaits the inevitable hour to receive all that live and breathe to-day. The process which everywhere goes on is one of evolution and revolution. Every disappearance is followed by a new form, readjusted upon a higher plane. The Earth is the Great Stone Book, giving us, as we turn the strata-leaves, illuminated pictures in bas-relief of the life-forms of past ages. What a Revelation! written by the finger of Time on the rock of Ages, and by the ink of Death. Nothing can falsify the record. It is immutable, and antedates by millions of years the printed books of man, which assume, with much pomp and circumstance, to tell us all about the beginnings of things.

Geology finds in the lower strata of rocks, just what we might expect to see if evolution is true: First, only the lowest forms of animal life, and

sea-weeds. Then, through later and later deposits, successively appear remains of fishes, reptiles, mammals, and finally man, together with all the varying forms of plant-life appropriate to the successive periods. Nor is this all. In many cases, intermediate forms between species have been found,—the “Missing Links” so often inquired for by the opponents of Evolution. Why all the generalized types are not found, is manifestly owing to the imperfection of the geological record, induced by the devastations of time; such as the action of heat and cold, and the convulsions of nature. Change is manifested everywhere, stability nowhere, except in the laws of universal causation. Form and substance are but puppets in the hands of one great master, Time.

Astronomy and Geology! twin liberators of the human mind,—one taught Infinite Space, the other Infinite Time. Before their birth was mental chaos. The popular theory of the heavens and earth was essentially mythological, like those of Greece and Rome, but shorn of all their wondrous beauty and refinement. Astronomy caught from dancing globes their laws of sustentation. Geology wrung from stubborn earth the jewels of her treasure-house.

V.

PROOFS FROM MORPHOLOGY.

CONVINCING proofs of the truth of evolution are found in the homologies of animal structure. It may be well to distinguish this word, Homology, from Analogy, which refers to organs similar in form or function, but differing in origin, while Homology relates to those parts or organs which, however dissimilar in office, were derived from one and the same part, modified and readjusted by use. For example, the wing of a bird and the wing of a butterfly are analogous, since they are both used for flying; but they are not homologous, for they had not a common origin. But the wing of a bird, the fore-paw of a reptile or mammal, and the arm of a man, are homologous, since they have the same general structure, modified for different uses. Analogous parts look alike, but are not alike; while homologous parts may have little or no resemblance, but are in fact the same parts in disguise.

Morphology, or the science which describes the

ideal forms or parts of organs,—the so-called structural “types” in living organisms,—runs throughout the entire animal and vegetable kingdoms. The structural evolution of one mammal is a type of the structural development of all. We will therefore select the horse, as at once the most beautiful and useful, needing only the gift of language to make him human. The beautiful form, color, size and structure of this animal were not fashioned at once, but have come to their present perfection through small and gradual changes extending back through vast periods of time. It has taken Nature ages and ages to make a horse, and she isn’t done with him yet or he wouldn’t balk and shy. The stock-breeders have joined hands with Nature and are rapidly improving his beauty, speed, and strength, while heredity is silently keeping the score.

From Geological discoveries we know that the horse came from a five-toed ancestor. In Europe, India and America he has been traced as far back as the early Eocene period, where he appeared no larger than a common fox. He then had three toes behind and four in front, with the rudiment of a fifth. Later on, we find him increased to the

size of a sheep, but minus the rudimentary toe. The next advance was to a three-toed animal all around, about the size of a yearling colt, with the rudiment of a fourth toe on each foot. This stage of his development was followed by a shortening up of the side toes, while the middle toe grew broader and stronger. Finally, in the Quarternary period, we have the modern horse as we see him to-day,—the side-splints yet remaining, as rudiments, to tell of his long line of descent.

What is true of the toes of the horse applies as well to the development of other parts of his structure. The principle applies not only to him, but to all living things. Descent with modification is a universal law. By the necessity of continually varying his modes of life, the horse has advanced from a useless little plantigrade quadruped to the position of the greatest help-mate of man, bearing patiently his many burdens and contributing in no small degree to his pleasure. But Evolution, which fashioned the horse and made him man's burden-bearer, is also raising up friendly inventors to emancipate him from some of his heavy toil.

All the organs, as well as all the parts of the skeletons of all animals, have undergone slow and

gradual changes, from the simplest beginnings up to their present complex state. New and ever-changing environments have brought corresponding modification of the organs or parts. Those no longer needful, shrunk to rudiments, finally disappeared altogether. Those needful and used were strengthened along their several lines of growth, until we have to-day all the wonders of form and function.

Nature never begins her work *de novo*, for her adaptive genius is so great that she can transform the old into the new. When she wanted to make a landsman of a fish, she did not give him a new pair of legs at once, but left him to utilize his fins for that purpose as best he could. Of course, he made bad work of it at first; but as he was left in the hard grip of necessity it was Hobson's choice. As he was often left on shallow, muddy shores by receding tides, he began to work his fins more vigorously, until finally, after many generations, in spite of a round of fatal failures, some of his kind succeeded in adapting their fins to this new use. The mud-fish of India, the Brazilian doras, and certain catfish of tropical America, take journeys of considerable length

across the dry land in this way. Thus the swim-bladders of certain of the early fishes gradually developed into lungs, the gill-arches into ears; the head enlarged; the circulation increased; a warmer current filled the veins; the tail-fin, not having much to do, dwindled to an ornamental appendage,—and then and there a quadruped was born.

Again, when Nature wanted a bird, she didn't make one out of raw material, as we are told, full-winged to soar away, but "worked over" the old fabric, just as thrifty housewives do, and do so wondrously well. Therefore, if wings are needed, the fore-limbs must go—they must be transformed into wings. Ages pass on; the earth is filled with birds, beasts, and creeping things, but the quadruped is king. He has grown to enormous size and strength, and appears in almost endless varieties. The struggle for existence has preserved the strongest, the most cunning, and those most highly skilled in the art of food-getting. The fierce warfare through which all living creatures have passed, would naturally sharpen all the senses, and stimulate, little by little, the power to observe and discriminate as to friend and foe, and

as to foods, and favoring localities. This would induce some sort of reflection, and implant in the mind at least a nebulous train of reason and ordered thought. This would give the brain more and better work to do, and the doing would increase its size, quality, and convolutions.

Why should advance stop at this point? Why should not the same progressive change and upward tendency still go on? Is the change from the mute little fish to a roaring Saurian less marvelous than the advance from highest mammal then existing to the earliest savage man, without speech, or language, and feeding on whatever prey the forest offered, including his own kind? Doubtless man lived thousands of years before he acquired what we would now call language. Nevertheless, his earliest cries and noises were the beginnings of connected speech; though no more intelligible than the chattering of apes.

If we could go back to this lowest conceivable savage, what should we find? Probably this: The anthropoid ape and the man-animal not quite out of sight of each other, but evolving on divergent roads from a common ancestor. If we could have stood near the diverging point, it would

have been difficult to tell which had the potency of the dominant animal who rules the world to-day.

Most people who try to reason about the matter, make the mistake of attempting to bridge the chasm at once from Shakspeare to a shrimp; and they say the difference is so enormous that Evolution cannot be true. But the thoughtful student goes back step by step, age by age, until he stands side by side with a creature half upright and howling, with all the ferocious instincts of a brute, but yet man-like in form and function, his language a jumble of incoherent noises, his moral sense yet undeveloped, killing and eating all he could overpower. From this field of vision, we can see little difference between our potential man and his fellows of the forest.

Some will ask, and do ask: "At just what point and under what circumstances, did the direct line of man begin?" And, "If it occurred once, why may it not occur again in the myriads of life-forms continually appearing upon the earth?" To the first query the answer must be, there is no such point. Evolution is but a shading and a becoming. But there were certainly *circumstances*

which led to the line of man, and these are not hard to imagine with the factors of evolution in view, and highly favoring conditions superadded.

Let it be remembered that a rugged environment necessitating marked changes through the use or disuse of organs, together with the ever-continuing struggle for existence, perpetuating the strongest and best under the law of heredity, are the great forces in Morphological development.

Once more, let us go back to the common ancestors of Man and the Anthropoid, and watch these primitive children as they start out together, some in one direction, some in another, their dispersion extending over broad territories during thousands of years, until at last they find themselves in utterly dissimilar environments; the one condition unfavorable, the other highly favorable to progressive development. Let us suppose the favored ones found themselves in the midst of circumstances not requiring tree-climbing, either for food or for safety. Naturally, they would begin to use their fore-paws for food-gathering, and for throwing missiles at enemies. This habit would gradually throw the weight of the body

more and more on the back-feet, leaving the arms and upper part of the body free for the various actions required. In time, adaptive changes would occur in the direction of an upright and flexible spine, and greater utility in the use of the arms. These changes, slight from generation to generation, in the aggregate would give us the hand of man, "which supplies all instruments, and gives him universal dominion." As Darwin remarks, "It accords with the principle of the division of physiological labor, which prevails throughout the animal kingdom, that, as the hands become perfected for prehension, the feet should have become perfected for support and locomotion." As these early man-animals went in herds and could utter cries, it is probable they soon learned to warn one another of the approach of danger, and also to express to one another their feelings and desires, which was doubtless the beginning of human speech.

There are those who, in the pride of intellect and reason, reject with contempt such a lowly origin. They prefer descent from disgraced perfection, rather than a steady ascent through all the lower forms. They accept the belief that

their bodies were made out of hand, from a lump of local dust, and that they are to this hour undergoing a penalty of pain and labor for a sin committed by a very distant relative, rather than believe in ascending excellence from the very first. In short, they would rather be fallen angels than risen men.

On this point Mr. Darwin speaks as follows: "Unless we wilfully close our eyes, we may with our present knowledge, approximately recognize our parentage; nor need we be ashamed of it. The most humble organism is something higher than the inorganic dust under our feet; and no one with an unbiased mind can study any living creature, however humble, without being struck with enthusiasm at its marvelous structure and properties." Finally it may be said that man is a product of all the ages, a summary of all evolutionary efforts, an epitome of all preceding life; he is literally "made up of a little of every creature's best,"—the crown and glory of cosmic energy.

VI.

PROOFS FROM EMBRYOLOGY.

PERHAPS the most striking evidence of the truth of Evolution, is found in the study of Embryology, which is the science of the embryonic cell. Three great stages of growth may here be noted, the cell, the individual, and the tribe. That all organic life has been evolved from primordial germ-cells during countless ages, is now the firm position of Science. Even the method and laws of growth have been clearly outlined. The microscopic germ-cell, when first stirred by the energy of life, subdivides, producing two primary germ-layers,—by fission again developing four secondary germ-layers, and so on. These new cells do not entirely separate, but remain in contact. From the continual aggregation of cell-forms, all the organs and parts of the body are developed. When an egg is formed by a multiplicity of cells, it separates into three distinct layers, called the ecto-blast, the endo-blast, and the meso-blast, from which are developed by differentiation the three great life-centres, namely, the

nervous system, the nutritive system, and the blood system ; and from these follow the multitudinous branchings to the highest stage of differentiation in the ontogenic series. Tracing any one of these groups, as the nervous system, we find it differentiates once more, forming the cerebro-spinal and ganglionic systems, each having different functions. The cerebro-spinal again differentiates into two systems, the voluntary and reflex,—these still again branching out into sensory and motor centres and fibres. The sensory-fibres branch out into the five senses with their separate functions. Take any one of the senses, as touch, and we observe that the nerve-fibres are not all alike. Some are sensitive to heat and cold ; others to pressure. The nutritive and blood systems have, likewise, their special lines of differentiation, culminating in all the different organs, parts and functions of the animal body. And this is the process of every life and every birth.

One of the most startling as well as one of the strongest proofs of evolution, is found in the fact that in Embryonic growth, each individual passes through all the successive stages which have preceded in the line of its tribal history. In other words, phylogeny is repeated in ontogeny ; the race

in the individual. At a certain point, the embryo ceases to personate its ancestors, and commences to take on the form peculiar to its own kind. Professor Haeckel, in his "Evolution of Man," has given a series of plates showing the development of the embryos of the fish, salamander, tortoise, chick, hog, calf, rabbit, and man. At certain stages in their pre-natal development, there is an exact resemblance of form among them all, each becoming specialized as it approaches the time of birth. At one period of its growth the human embryo has the long, free, swinging tail of the races below it.

Whither does all this array of facts lead? What explanation can the creationist give? If man was fashioned at once, why drag him to nativity through all the forms of the brute-creation? Why masquerade him in the guise of the dumb, ferocious, and soul-less brutes? There is no reasonable explanation of these facts outside of the theory of development. There is no escape from the conclusion that man, and all mammals, have a common origin and a similar philogenic history. How strange and stirring is the thought. The changes of ages are compressed into the brief span of embryonic life!

VII.

PROOFS FROM METAMORPHOSIS.

METAMORPHOSIS is closely allied to embryological development. In the latter the changes are all pre-natal; in the former, they continue after birth,—the transformations taking place before our very eyes. All are familiar with the common examples. The frog begins life as a fish; limbs grow, and lungs displace gills, as he passes on to the condition of a tail-less croaker. Butterflies, bees and beetles start out as grubs, and undergo what wondrous transformations! The star-fish is first a swimming worm; the crab is born a tail-like shrimp.

Metamorphosis is simply a term to describe the transformations which take place under our own eyes, but the pre-natal development is equally metamorphic. All living creatures pass through all the stages common to the race below them, finally branching off to their own special class. This is the most mysterious and deeply-seated principle of life-growth. The stepping-stones of

upward life are the vanishing forms of all the past. Each new stage is a birth from the preceding. All is metamorphosis from first to last. What can all this mean? In vain we ask the advocates of the Creation theory to explain. Like Sir John Falstaff, they will give no reasons on compulsion. We find in Metamorphosis the strongest support to the great law of Evolution, modification and adaptation operating everywhere on the children of life.

VIII.

PROOFS FROM RUDIMENTARY ORGANS.

THE proofs of the Evolution theory from the existence of Rudimentary Organs are as interesting as convincing. Nature has strewn the life-path with dwarfed and dying forms, which testify to her marvelous work in moulding mind and matter. She never quite hides her tracks, but leaves in bone and tissue, in rock and flower, memorials of her brooding care. Her earliest children were lowly born, and over their natal-bed arose the rhythmic murmur of the sea. Rocked on its billowed breast, these children grew and filled the early waters with their kind, from which developed all divergent forms. Throughout this upward struggle of elemental life, Heredity, like a miser hoarding his bags of gold, has kept brief remnants of family traits for ages, letting them go only as compelled by the iron grip of that "fierce Spirit of the glass and scythe, Remorseless Time."

We will note a few of the Rudiments which inheritance has still preserved, and let them serve

as examples of the multitudinous whole. It is well known that the baleen whale has no teeth, and no use for any; yet its embryo has a full set, which disappear before birth by absorption. The plain inference is that the whale has not always been a water-animal; that his ancestors had teeth and legs, and roamed through forest, swamp and marsh. In some whales, also, pelvic bones are found, and yet they have no hind legs. Such bones are mere rudiments of the former attachment of legs. Again, rudimentary hairs are found in the skin, being but fragments of the hairy coat their ancestors once wore, before they paddled their own canoes on the briny deep. The breathing-organs of the whale are modeled for air-breathing, not for water-breathing. It would thus appear that our great oil-producer came first from the water, then acquired the structure of a quadruped, and finally went back again to his native deep. Why did he go back? Will our theological friends say, "It was to swallow Jonah"?

The Python, also, has rudiments of legs; and the embryo of the calf has teeth which are absorbed before birth. The splint-bones of a horse's foot, the turtle's flipper, the dew-claw of dogs, the tails of birds, and the gill-arches of

reptiles, are all useless rudiments. The crabs and fish in the Mammoth Cave have lost their eyes by disuse, but the sockets remain as rudimentary remnants. But more significant than all these, are the proofs furnished by the highest animal—Man. In all parts of his bodily structure are found the strongest evidences of his animal origin. He has dormant scalp and skin muscles, which were of great service to his ancestors, but of no use to him. Many persons are found who still possess the faculty of moving the scalp and ears in a remarkable degree, owing, no doubt, to the fact that their ancestors have continued the habit. Man has a remnant of a third eye-lid, now possessed only by some birds and beasts, in the crescent-shaped fold next to the nose. The nipples and mammary glands of males are wholly useless and suggest the differentiation of the two sexes from a common parent form. The sparse covering of hair on the human body is a lingering reminder of a time when clothes were at a discount. Even now we see some hairy specimens of humanity exhibited as curiosities, which doubtless represent a reversion to ancestral conditions. The thyroid gland in man is a rudimentary and wholly useless organ, which sometimes becomes the seat of

certain forms of disease. In man as in some of the lower animals, a sort of pouch about two inches long, which is not only useless, but is a constant source of danger, is attached to the cæcum of the large intestine.

Another proof of man's descent from an ape-like ancestor, is the fact that the human embryo, in common with such animals, has at one period of its growth, a free projecting tail, which shortens up before birth, leaving, however, several well-defined vertebræ at the end of the spine. These are wholly useless and are, moreover, subject to injury.

The vascular system in man is also far from perfect, as we still retain, in part, such valvular arrangements as are best suited to the quadruped; and to the lack of a better arrangement many of life's ills are due. Many of the visceral attachments in men, and especially in women, are also adapted to a creature which walks on "all fours," but are very imperfect in their adaption to an upright posture of the body. If man was created out and out, such workmanship implies a woeful want of wisdom or constructive skill on the part of his maker. These facts, however, are readily explained on the theory of Evolution.

IX.

PROOFS FROM GEOGRAPHICAL DISTRIBUTION.

THE doctrine of Derivation is much strengthened by the study of the distribution of animals over the globe. We find the dispersion just such as we should expect to see if the theory of evolution were true. If created suddenly, we ought to find them after their kind, indiscriminately inhabiting islands and continents. But, instead, we find that the greater the isolation of the island, the fewer animals; and those found are more specialized in type. On the other hand, where opportunities for migration have been favorable, we observe the greatest variety of life.

Again, if specific centers of creation were the method, each species would be best fitted for its own environment, and could not exist in any other. But the facts show that both animals and plants will flourish far away from their native homes, under totally different physical conditions; in many cases with decided advantage from the change.

There are many factors which give rise to diversity of organism as influenced by geographical location, such as temperature, the effect of mountain barriers, and glacial action which induced migration. This subject is so broad and deep that we have only time to mention the remarkable fact concerning the fauna and flora of Australia. Its entire range of animal and plant-life, with trifling exceptions, is found nowhere else on the globe. Among the great land-areas of the earth, it presents a striking case of retarded evolution, shown alike in species, genera, families and orders. It is a country of synthetic types. We still have there the egg-laying mammals, and the pouched marsupials, of which there are many species; but of true mammals, there are none. Australia and a few other oceanic islands—notably the Galapagos and Madagascar—seem to be but rudimentary parts of the great body of the globe. Here the tide of Evolution has been checked. Even the natives are among the lowest in the scale of human beings.

What is the significance of all these facts? Why should Australia be some ages behind its rivals of like climate and soil? It is still in the

Mesozoic age. The answer is inevitable. This great island, though doubtless once joined to Asia, lies in complete isolation, thus shutting out the migration of fierce animals; and those now there have changed but little from earlier types. The reason for this lagging development is the comparative absence of that fierce struggle for existence, which elsewhere prevails. No lion is there to frighten and destroy the kangaroo; no howling wolves to chase the monotrema. Australia is monkey-less and ape-less, although these animals abound elsewhere in like climates. Wherever the battle for life has been strongest, there we find the greatest progress and variety of development. The dwellers of mid-ocean islands have an easy, lazy time of it. "Far from the madding crowd's ignoble strife, they kept the noiseless tenor of their way."

As Mr. Wallace remarks: "We find the continental islands inhabited by animal life more or less similar to that of the mainland, according to time and distance of the separation." All these facts are in perfect harmony with the theory of Evolution, and utterly at variance with any other hypothesis whatsoever. From the first dawning

---

of life to the present moment, varieties of animal-forms and organs have developed most rapidly under the spurring whip of the fiercest warfare — a warfare not only of life against life, but of Nature against all. Heat and cold, dryness and moisture, wind and tide, lightning and storm, flood and fire, mountain and chasm, pestilence and famine, mist and darkness, one and all have stood like frowning giants in the path of living forms. But in spite of all these barriers, in spite of inter-racial strife of beak and claw, of tooth and venom, the residuary column has pushed onward and upward, readjusting itself to ever-changing conditions. Indeed, this very opposition and antagonism have been the potent factors in the ascent of animal life. Australia has not kept pace with the continents because the warfare there has been little more than a skirmish. The continents have advanced under the great law of *might*. The weak, the indolent, and the stupid, were swept from among the living; the strong, the resolute, and cunning, remained victors. Evolution, and Evolution only, explains the facts of Geographical Distribution.

X.

PROOFS FROM DISCOVERED LINKS.

WHERE are your "Missing Links"? cried the critics of Evolution after their recovery from the first shock of Mr. Darwin's "Origin of Species" in 1859, and again after the publication of his later work, "The Descent of Man." From theological quarters, after the laugh had subsided, came severe denunciation of the doctrine. It was said that the Evolution hypothesis was both childish and dangerous, and that Darwin himself was the Munchausen of his time. Even to-day, thirty years from the time of that remarkable publication, the masses—those innocent of any learning on the subject, and those who study fortified to disbelieve—alike cry out in chorus, "Show us the 'Missing links.'" This outcry has narrowed itself down to the demand for man's immediate ancestor. They want an ape who can build a fire, whistle, and sing the Doxology; though they might possibly throw off the fire and the whistle.

Before opening the cabinet of "Discovered

links," it may be well clearly to understand just what we should, and just what we should not, expect to find. First, as to those living links which we do not find, it may be affirmed that their very absence is proof of Evolution. Its vital principle forbids their presence. Natural Selection sends the weakest to the wall, and so the transitional forms do not live to be looked at. No one life, nor a thousand, is long enough to observe the changing forms. As Mr. Darwin remarks: "They perish by the very process of the formation of the new species." A hundred thousand years or more have doubtless passed since man was first a man. His ancestral link was prior to himself, and could not have survived after man was fully evolved. It could not remain a link, but must push on to a fully developed man. If it were not so, Evolution would be but a childish dream.

But the graded forms from brute to man, have all been on the earth. "Why," you ask, "do we not find their remains now?" For this reason: Only now and then one was drowned; for it must be remembered that ocean travel was limited in those days, and yachting parties were somewhat

exceptional. It is doubtful whether the "Missing Link" was either a sailor or a swimmer. Now, it is obvious that only those links meeting a watery fate would stand any chance of being preserved in the stratified rocks for subsequent discovery. Besides, a link before becoming immersed in hardening mud and sand, would do well if he escaped being eaten by link-eating monsters of the deep. And as for being preserved on land, what could one poor little heap of bones do as against the mutation of half a million years? Therefore, in the very nature of time and things, we could not certainly expect to find a man-like link, living or dead. The soft parts of animals and plants, from their very nature, must disappear. The rocks themselves crumble and waste away, to be borne to the sea again with all their wealth of fossil forms. The earth is broad and deep, the stones hard, and the searchers are few; and moreover, the work is hardly yet begun. A museum of "Missing Links" will be the attraction of the future. Nevertheless, with the door of Nature doubly barred, our sturdy scientists have broken through and disclosed some of the rich treasures beyond.

First, we will notice some of the living links to be found, not on account of Evolution, but in spite of it. These are cases mainly of retarded or arrested development, which will doubtless culminate at last in true types, the links finally disappearing. The most interesting group of synthetic types are the Amphibians—interesting because it explains how we got out of the water, and into the woods. The frog, whose transformations have already been referred to, is the most familiar example of this group. The shores of the early seas were doubtless the scenes of many equally remarkable transformations. The creatures, ocean born, were brave and hardy fellows, and bent on becoming land-lubbers at any cost. All the Amphibians must be regarded as links between the true water animals and land animals. Their swim-bladders were made into lungs, their fins into legs, their scales into hair and feathers.

The living link between the egg-layers and the milk-givers is the class of Marsupials, of which the Kangaroo is a familiar example, which bring forth their young in an imperfect state, the development being completed in a pouch in front. In fact, the entire fauna of Australia may be regarded

as generalized types. Prof. Owen has described two curious creatures discovered there,—the echidna and ornithorhyncus,—still more primitive than the kangaroo. They are pre-marsupials. They are both egg-layers, as no other hairy quadruped is. Their eggs are placed, that of the echidna in a pouch, as the marsupials carry their immature young, and that of the ornithorhyncus in a nest, and there hatched. Like no typical egg-layer, they suckle their young. The ornithorhyncus, which has a bill like a duck, has bones resembling those of birds, reptiles and seals. What can all this mean if not descent with modification? Professor Huxley declares: “On the evidence of Palæontology, the evolution of many existing forms of animal life from their predecessors is no longer an hypothesis but an historical fact.”

The links between the animal and vegetable kingdoms are abundant. The Rhizopod is a fine example. It has sensation, and seemingly purpose, though non-cellular and inorganic. The polyp, has no arterial or circulatory system. It consists of simple layers of cells, and is propagated by buds. Here is a being which eats and grows like an animal and yet is propagated like a vegeta-

ble. The sponge is an egg-layer. Its eggs bud or hatch and grow to adult life. These cases among the Protista, which are neither strictly animal or vegetable, suggest the beginning of differentiation from a common protoplasmic cell.

Turning to the fossil world, we find, as we should expect, innumerable examples of connecting forms. In the later deposits, we find remains of toothed birds, having many reptilian characteristics. Reptiles were then not a fixed type, but shaded gradually from fish to bird. The *Archæopteryx*, a fossil rarely found, was a true link between the birds and reptiles.

Certainly, no two kinds of living things are more unlike than birds and reptiles, or more antagonistic in their natures, mutually preying on each other; and yet their relationship is clearly established. Psychologically, they have nothing in common but hate; and yet the bird is only a feathered reptile. Within three years, there was found, in the slate deposits of Bavaria, a specimen of a reptilian-bird—now preserved in the British Museum—which has a long, lizard-like tail of twenty joints. Says Professor Vogt, “This is neither bird nor reptile, but a decided link between the two.” In the later chalk formations many

fossils have been found by Professor Marsh, more bird-like in character, but still possessing teeth. The flying dragons afford another link between birds and reptiles. The front half was decidedly bird-like, but the hind legs and pelvis were strongly reptilian.

The anaplotherium connects the swine with the cud-chewers; the zeuglodon connects whales with seals; and the palæotherium connects hogs with the rhinoceros. These are all true links.

A remarkable example of a perfect succession of links is found in the fossil shells of the Tertiary rocks of Wurtemberg, which are literally packed with fossil forms. These shells show a complete grading to correspond with the order of the rock-deposits. Here is evolutionary perfection without a break. The life once within these shells, in its tribal history presents no "missing links."

To sum up, we find the sponge family—the animal-vegetable—near the original protoplasm. The lancelet—the first of the back-bone tribe, with only a line of cartilage in place of spinal vertebræ—connects fishes and mollusks; the amphibians connect fishes and mammals; the Archæopteryx connects birds and reptiles; the kangaroo

connects egg-layers and milk-givers ; but between man and the ape there is no living link. Nor can there be if Evolution is true ; yet it is not less certain that he has been evolved from a lower animal form than that these other steps in biological development have taken place.

Professor Wilson, of Edinburgh, says : “There can be no Evolution for one group, and special creation for another. There can be no Evolution for the lower races, and creation for the higher forms of animal life, or for man himself. Uniformity and sequence exist wholly, or not at all.” Professor Huxley also declares, “If one series of species has come into existence by the operation of natural causes, it seems folly to deny that all may have arisen in the same way.”

It has been truly said, “Of special creation the rocks tell no tale.” Nor do the present living forms which roam beneath “this brave o’erhanging firmament,” while all the fossil dead, and all living creatures, give out some hint or indication of the things they were, and of the evolutionary process through which they have reached their present estate.

XI.

PROOFS FROM ARTIFICIAL BREEDING.

It is well known that nearly all domestic animals, food-plants, fruits, and flowers have been greatly improved by man's endeavor to produce higher and better forms. His success has been phenomenal in modifying size, form, color, speed, strength, and beauty. If such marvelous results may be achieved in one individual's lifetime by accelerating the Law of Selection, what wonders might we not expect Nature to perform in the ages gone by?

The wild species have been modified by Natural Selection during countless ages. In a degree man can repeat and augment this developmental process in his own brief life; nay, he can almost witness an entire change of species. Individual inheritance is from all the preceding race, but strongest from the immediate parent. Heredity is cumulative, and tends toward fixity and stability, until finally the opposite tendency to reversion is overcome.

Professor LeConte says : “During the brief history of man, races of the different domestic animals and plants have been found, differing so greatly from each other that if discovered in a wild state they would certainly be called different species, and in some cases genera. If art accomplishes this result by Artificial Selection, why not Nature by Natural Selection ?”

The objectors say, “We cannot admit this evidence, for if your improved breeds are turned out again, they would revert to original types.” The Evolutionist replies: Heredity is a plant of slow growth. It increases slowly and holds firmly; time is the measure of its strength. If pushed rapidly, it will hold lightly. This is a universal principle; what is longest in coming to maturity is strongest. He answers likewise: Domestic animals, if sent back to the wild state, enter a new environment and must begin anew a struggle for existence in competition with their fellows of the woods. They are out of harmony with their former artificial conditions, and a readjustment must take place. Tame and wild animals are put on common ground. They are forced into competition, and must needs fight or die. The

very principle of Evolution demands reversion in such cases.

There are, however, two interesting questions, not yet fully answered; although they do not affect at all the truth or probability of the theory of Descent. First, what is the cause of variation? And, secondly, What is the cause of the first step in *usefulness*? Why should there be a *tendency* to vary? * Use can improve an organ, but how can it start one? And how does it start itself? The answer to these questions may perhaps be found in subsequent investigations of the psychological phases of the life-problem.

---

* Since the delivery of this Essay, a writer in the "Popular Science Monthly" for April, 1889, maintains with much force that the Tendency to Vary is due largely to Psycho-Physiological influences.

XII.

PROOFS FROM REVERSION.

ONE of the most curious facts of Evolution is the tendency to revert to ancestral forms. This at first seems to weaken the theory of Descent, but in reality it gives it great support. It is all a question of environment. If that remains the same, there will be little change in life-forms. For this reason the King-Crab and the Nautilus of to-day are quite similar to their fossil parents. If former life-conditions are restored, what is more natural than retrogression?

But even here, paradoxical as it may seem, there is really progress, for Evolution always insists on the readjustment of organs to environment. The changes are best for the animal under the circumstances, and therefore truly an advance for him. This tendency to reversion is shown by the stripes on some horses and mules—a survival of the stripes on the wild horse, such as we see on the zebra; also, by the

animal teeth, peculiar muscles and hairy covering possessed by some men and women. The barnacle, once a free-swimmer, is now a lazy ride-stealer, a free-booter and pirate of the sea, threatening to scuttle the ship. Some island insects and many varieties of birds have lost the power to fly by long disuse of their wings, safety and food not requiring flight. The whale has lost his ability to walk on dry land. In general, when any organ has become useless, it tends to retrogression, and finally becomes rudimentary. Nature abhors the useless. But this reversion is always slow, as Heredity is ever jealous of her store.

Reversions are but eddies in the great stream of Evolution, and like eddies show the direction of the current. It is as though Nature had sent a courier back a little way to guide us more clearly on in our investigations. This feature of Evolution, theology should accept since it recognizes the principle of "back-sliding." The mites and ticks have doubtlessly fallen from spiders and scorpions. The insect, *Stylops*, with aborted wings, has sunk from a free-flyer to the ignoble life of a parasite.

In closing this branch of the subject I will quote Professor Wilson: "While progressive Evo-

lution develops the great tree of life, extends each branch, clothes it with verdure, and expands each blossom, it is degeneration which lops off the worn and aged stems, prunes the weakly foliage, trims the budding growths, and so directs and moulds the outlines of the organic whole."

XIII.

PROOFS FROM MIMICRY.

MIMICRY, or the imitative faculty of some plants and animals, gives us most interesting testimony for Evolution. Some insects and birds, through the law of Natural Selection, in configuration and color are like the natural objects over which they roam, thus securing a degree of protection from their natural enemies. The brooding bobolink harmonizes with its nest, while its unfettered mate in gay attire soars happily around. But the valiant crow needs no protection, and so is "black as crows can be." Those female birds and insects which serve as prey for their enemies are inconspicuous in color, while their mates are dressed in fine raiment. That curious little insect, the walking-stick, looks precisely like a brown twig broken from a tree; others resemble the leaves of plants which grow in their neighborhood. Some animals feign or mimic death to escape such foes as devour only what they kill. Others, again,

---

resemble a more ferocious animal, and thus secure immunity from attack.

Not all creatures, however, are thus protected, especially of the domestic class. But why should safety by imitation be accorded to some and not to all animals, if all things were created out of hand? Some are left defenseless; others are aided in concealment. Every animal has his foe, and must battle for his life. This, from the point of view of special creation, does not look like eternal and even-handed justice. It looks, rather, like a logical result of the operation of Mr. Darwin's great principles of Natural and Sexual Selection.

XIV.

SPONTANEOUS GENERATION.

THERE are two classes of scientific travelers, who go back on the Evolution road happily together, until they reach the point of Spontaneous Generation, and there they part company with none too friendly voice. The one with theological views insists that the germ-cells were created, just as he once used to think Adam was created. The other maintains that this speck of protoplasm was formed by chemical and electrical action, and other natural means, operating under once favorable conditions on the primitive slime; and that from these primordial cells all succeeding life has sprung. In other words, he believes that the life-principle is resident in matter itself, needing only vivifying conditions to make it active. Why our theological friend need diverge at all is not clear. If simply the power and wisdom of a Creator are in question, there should be no disagreement; for it is certainly a greater display of Creative skill to make an all-pervading law than to make out of

hand a few germ-cells. It is greater to evolve a principle than make a simple thing. A thing wears out; a principle is eternal.

It would seem that Evolution cannot fairly stop at this little atom of carbon compound. Is it afraid or powerless to take the mystic step between the living and the non-living? Did Evolution operate all the way from "star-dust" down to this little speck and then cease to operate? Could it make worlds, suns, and systems, and yet prove inefficient at this vital point? Is it not grander to think we were made out of something than out of nothing? If creation really was the method, why give us the Garden of Eden, with the Fall of Man thrown in, rather than the millions of years of struggling, warring life, in order to reach our manhood? If we were created, then why was it necessary to start us so low?

But, say the critics, "If life was evolved once out of inorganic conditions, why not again?" Why not, indeed? Who knows what life is evolving in torrid climes under the deep-sea ooze? But it may be that the conditions of life-birth have forever passed. No one has yet proved or disproved beyond the shadow of a doubt the

method of the genesis of life on our globe. But there is no reason to suppose there has been a break in Evolution, and every reason for believing that it has formed one continuous line of succession from Nebula to Man. There is no element in plant or animal not found also outside of them. It is mimicry or imitation on a grand scale from first to last. The Moneron has bequeathed its albuminous carbon compound to all subsequent life ; and we are what we eat and walk on. The formation of the crystal corresponds to inheritance and adaptation in organic evolution. It is all a question of degree. Professor Haeckel and many other eminent scientists hold this view. Professor Tyndall says, "Matter has in it the promise and potency of all forms of life."

XV.

A SUMMARY OF EVIDENCE.

IN closing we will briefly present a summary of evidence.

Astronomy declares the unity and universality of the laws of gravitation and evolution. The Nebular Hypothesis explains how by the operation of these laws "the infinite meadows of heaven" are filled with orbs "unutterably bright."

Geology describes the Evolution of the Earth from a formless void to wrinkled age. Entombed within the leaves of rock are found in nice gradation all forms of upward-tending life, no sharp lines between the types, but insensible shading from first to last. As a writer happily puts it: "It is as if Nature wrote her own autobiography, using for an alphabet the hieroglyphics of life."

Embryology testifies as to the method of animal evolution. It is a brief summary of the story of the race in the life of the individual, a rehearsing

of the sublime drama of all time. Is this all a meaningless phenomenon, a senseless panorama? Is this "epitome and brief chronicle" of the ages only a whimsical incantation of some occult power? Is it not rather, on the contrary, a demonstration of Nature's method of Evolution?

Metamorphosis makes this assurance doubly sure; for we can see the evolving forms before our very eyes. Nature is an unsolvable riddle only to the sightless and thoughtless.

Rudimentary organs are among the strongest proofs of descent, and are present throughout the vegetable and animal kingdoms. To the biologist, man is a curiosity shop, the whale a traveling museum. Was Man created in the image of his Maker? Why, he isn't half made yet. The chips of the shop are still on him. He needs yet the emery-stone of time. But he is in the hands of a tireless Master, deft fashioner of form and function—Evolution.

Artificial Breeding is proof of the method of Nature's workings. Man can accelerate the process of Nature. He has given us better stock and better food-stuffs. Darwin in twenty years

accomplished what it would have taken Natural Selection thousands of years to do. By following the method of Nature man has become the originator of higher forms—a conscious factor of Evolution.

Reversion says that the two kingdoms of life are full of antagonisms—that ebb and flow are in the heart of all things—that strong and stubborn Heredity has a master—environment. Heredity never originates. It merely holds and perpetuates. If the surroundings are more favorable for return to the parent form than to the maintenance of the derived form, the organism will go back to the former. Life-forms may go onward or backward according to the demands of adaptation. But the final result is progress—it is Evolution.

Geographical Distribution furnishes evidence of the strongest kind for the case of Evolution. It explains the wide diversity of animals and plants on the earth, that they have sprung from common sources, and have become scattered by migration and other causes. The wider the separation of islands the greater the variation of organic types from their kindred on the mainland. These facts

point away from the creation theory, and directly to Evolution.

Homology, or the Science of Likenesses, throws a flood of light on the question of development. It proves, by the exhibition of the successive steps, how the whole was accomplished. Mr. Spencer says: "What now can be the meaning of this community of structure among these thousands of species? To say it is the work of design, to say that the Creator followed the pattern throughout, merely for the purpose of maintaining it, is to assign a motive which if avowed by a human being we would call whimsical." The only rational explanation of natural homologies is Evolution.

Mimicry, or *Imitation*, adds a strong link to the chain of evidence in support of Evolution. When strength or courage is wanting, cunning supplies its place. This imitative tendency extends over a wide range of life-forms, and even enters the circle of human society. Few men or women dare be original and independent, fearing to meet the shafts of malice and detraction. To imitate others is the safest way. Therefore all reforms, high thoughts, and new ideas, find slow

acceptance; but to these alone we look for progress.

The new theology, based upon Evolution, has to combat the selfish propensity of man to seek for his own ease and resist progress and change. It is easier to dream and be common than to think and be exceptional. It is all a question of the *gray matter* of the brain,—of Evolution.

XVI.

LANGUAGE AND THE MORAL SENSE.

THE great difference between man and the lower animal is the possession by the former of Language and the Moral Sense. This difference as at present manifested is indeed almost infinite. But let us go back on the tide of time—back even thousands of years before the cave-men, when speech was but a chatter and conscience was as yet undeveloped; then the difference would be a vanishing quantity.

The higher animals, in common with man, manifest joy, sorrow, love, hate, fear, courage, fidelity, gratitude, jealousy, memory and reason, and these qualities are clearly shown in their actions. One dog will watch another at his bone without interfering with the right of prior possession; but once let it be abandoned, and the watcher's paw upon it, let him take it who dares! This is a recognition of the principle of ownership and property-right, and therefore contains a glimmer of conscience. With the development of the larynx and the brain in man came speech and conscience, and all the heights of mind.

XVII.

CONCLUSION.

THE final question which demands our attention is, How does man stand to-day, affected by Evolution? By it we are chained to all the past; we are pledged to all the future. We are a part of Universal Life, of life supreme, of life eternal. We have always been coming; we will always be going. Our influence for good or ill will be everlasting. The difference between the atom and the All is one of degree, not of kind. We are kindred at once to the highest and to the lowest.

The crown and jewel, the bloom and fruit of Evolution is moral grandeur—is conscience. Like mind, motive, reason, will and language, it was lowly born, and has risen from the manger of consciousness. It is the collected inheritance of the best tendencies of life.

Evolution insists on the importance of this world, and yet from Love that stands waiting to clasp its idols in a future life, it takes no hope.

Evolution is sweeping from the world a crude and cruel theology, giving forth a promise of

“sweetness and light,”—of better social conditions and individual progress. The old theology worships the Unknown, and prays to change the changeless. It believes at least in “Theological selection,” insuring the survival of the “elect,” while the tropic storm of pain sweeps over all the rest. Evolution has entered every pulpit, and softened every harsh voice, and is hopeful of the time when to creedless moral beauty, man will concede a crown.

Man entered the world, as Evolution assures us, not in disobedience, but in unison with the two grandest forces in breathing Nature. He began life with innocence, and under the inspiration of Hunger and Love. The one led to the divinity of Labor; the other to the heights of Happiness. Theology declares that he began the world turned out from Paradise; Hunger without a crust and Love without a home. The one idea was upward; the other downward. Which is better?

In this presentation of the case of Evolution, I am aware that only the borders of the broad field have been touched. The fulness of ripe-eared Truth lies yet in store. If I have made you hungry, it is well.

LIBRARY OF CONGRESS

0 007 894 507 2