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BY

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NOTE.

THESE are sermons which were delivered in the ordinary course of the year's work in the Unitarian Church. Their publication was the afterthought of some who heard them; and they are printed as preached. They are full of quotations now untraceable. But the books before me, I know, included Thomson's "Bible of Nature," "Heredity," "The Science of Life," Ray Lankester's "Extinct Animals" and "Kingdom of Man," Saleeby's "Evolution the Master Key," Duncan's "New Knowledge," Le Bon's "Evolution of Forces," Butler Burke's "Origin of Life."

W.J.

AUCKLAND,
April, 1909.

I.

THE BIBLE OF NATURE.

"The heavens declare the glory of God;
And the firmament sheweth His handywork.
Day unto day uttereth speech,
And night unto night sheweth knowledge."
—Ps. xix. 1, 2.

A little book has been published lately, called the Bible of Nature. Its author is a well-known and recognised man of science, J. Arthur Thomson, Professor of Natural History in the Scottish University of Aberdeen. It consists of five lectures, delivered on a theological foundation in a college of America; and this little book seems to me of such striking significance in the theological world that I consider it my duty to draw your attention to it.

Further, the book is so interesting in itself that I have decided to take up its contents and to make them the subjects of my next four Sunday sermons. In a singularly easy and lucid manner, Professor Thomson puts you abreast of the latest results of scientific discovery, especially with regard to the origin and evolution of the earth and earth life. In itself this is extremely valuable for everyone to know, and of especial interest in view of all that even the casual reader of the newspaper must read this year of Chas. Darwin, with whose name the modern conception of the universe is so intimately bound up. One of the great problems of the present day for thoughtful minds, is to reconcile the results of scientific discovery with the conceptions and practices of religion; and Professor Thomson's book ought to help materially in

solving that problem. The next four Sundays I shall try to popularize, and draw out the implications of what he says. Meanwhile I want to make you feel, as I feel, the great significance of the book itself, as a straw on the stream of modern thought, showing in what direction the theological world is moving.

Partly its significance lies in the contents of the book, partly in the title, and chiefly in the circumstances of its origin and publication.

The opening lecture is on the wonder of the world, the immensity and magnificent abundance of power in Nature, her marvellous complexity and beauty and order. The sense of wonder is not killed by science, but increased; and this wonder is one of the footstools of religion. He then proceeds to consider the history of the earth as a cooling star that is millions of years old. Then he treats of the origin of life on the earth; next of the evolution of animal species; and, lastly, of the coming and development of man. The book is, therefore, in all sobriety, a modern Book of Genesis, reflecting, not the fancies of a religious enthusiast, but the well weighed conclusions of modern science.

And the author does not hesitate to call it so—the first book of the Bible of Nature, "intending to suggest that Nature is a book we can read, and ought to read, a book from which we may learn much that concerns our mortal well-being." But to call Nature a Bible carries greater significance than the suggestion that it is a book. Bible carries a deeper meaning than mere book. It carries the meaning of Sacred Book, Book of Divine Revelation, Inspired Book, man's holiest and best guide to conduct and belief. Hitherto the word Bible

has been exclusively reserved for the books of the Old and New Testament. These formed the Holy Bible of Christendom; these were regarded as containing exclusively the divine commands and directions for human practice and belief. And now comes along Professor Thomson, a leader of science, and proposes to give all that sacred significance, that meaning of revelation, that force of authority, to the Book of Nature. A few years ago it would have been considered simply heathenish to do this. Orthodoxy taught that the distinguishing feature between Christianity and all other religions was that Christians had an infallible revelation, the Bible, and that heathens lived by the light of Nature, by mere human understanding; and nothing could exceed the scorn with which the Light of Nature was regarded:—it fostered pride; it led astray; it was a will-o'-the-wisp; what mattered most to men was the plan of divine salvation, and that could not be read in the book of Nature; God had written it in one book alone, the Hebrew and Christian Scriptures. The title, Bible of Nature, would have been considered almost blasphemous, as suggesting that a plan of salvation might be found by the exercise of the unaided human faculties. Where, in that case, would be the necessity for the inspiration of the Prophets, the place of the Chosen People, the vicarious necessity of Christ's death, the importance of the Christian Religion?

I want you to feel that Professor Thomson's book is essentially a religious book, even consciously intended to be a religious book. That goes with the title. Nature, to those who can read its deepest meaning, is not merely a book but a Sacred Book, a Book of God, a Divine Revelation.

The word Bible carries that significance. And I want you to feel how impossible that title and intention would have been a few years ago. The world was then filled with the noise of a conflict between Religion and Science; and Science, the study of Nature, was regarded by not a few as given over to Atheism. Professor Thomson's title carries the meaning that science, in the person of one of its foremost leaders, definitely repudiates the charge of atheism, yea also the newer charge of agnosticism, and definitely claims to have a religious implication. That, from the side of Science.

But there is more in it still, from the side of orthodox religion, and this comes out most clearly from the circumstances attaching to the origin of the book. Briefly, the fact is that these lectures, which claim a divine revelation in science, have been brought out under orthodox auspices. The book may be said, therefore, to represent no less than a surrender, on the part of Orthodoxy, of its old exclusive claims for the Bible. Some thirty years ago, a worthy gentleman of Chicago bequeathed £8,000 to the Lake Forest University, the income of which was to be spent for the purpose of stimulating the production of the best books on the connection between Science and the Christian Religion. The object of the donor was "to enlist the services of the ripest scholarship and highest talent to illustrate from science, and to demonstrate the divine origin and authority of the Christian Scriptures." That phrase alone would be enough to make obvious the strict orthodoxy of the foundation; an inference made surer by the fact that the publication previous to Professor

Thomson's was the most reactionary book on Old Testament criticism issued by a leading scholar in modern times. But to make it still clearer, and to leave no room for mistake, the founder, in his deed of gift, declares that he has in view "the religion of the Old and New Testament of our Lord and Saviour Jesus Christ, as commonly received in the Presbyterian and other evangelical churches." Here is a foundation, then, intended to illustrate and demonstrate the divine authority of the revelation contained in the Old and New Testaments. Thirty years ago there is no doubt as to how the doctrine concerning Scripture stood. It is clearly set forth in the Westminster Confession of Faith:—"The whole counsel of God, concerning all things necessary for man's salvation, faith, and life, is either expressly set down in Scripture, or by good and necessary consequence may be deduced from Scripture; unto which nothing at any time is to be added, whether by new revelations of the spirit, or traditions of men." Yet here we have this orthodox foundation publishing a book which (1) calls itself another Bible, (2) sets forth doctrines as indisputably true which absolutely contradict the so-called perfection and sufficiency of the old Bible, and (3) in point of fact quietly ignores the divine authority of Scripture and sets up instead the sufficiency of human reason.

Am I not right in pointing to this as a straw on the stream of religious thought? Ever since Darwin's day, and the perfecting of the sciences of geology, astronomy, biology, and evolution, orthodoxy has been struggling to retain the exclusive and supernatural authority of the Scriptures against the insidious approach of a wider and

natural conception of revelation, and generation after generation it has had to surrender one position after another in the conflict. Do you remember Huxley's description of the way in which he was led to make his well-known attacks on orthodox Christianity? The Bible, he says, was constantly thrust in his way. He had set out on a journey with no other purpose than that of exploring a certain province of natural knowledge. He strayed no hair's breadth from the course which it was his right and duty to pursue; and yet he found that, whatever route he took, before long he came to a tall and formidable fence, a thorny barrier, with a threatening notice board: "No thoroughfare. By order. Moses." There seemed no way over. He was not minded to creep through, like some. There was nothing for him to do, but either to give up the pursuit of science, or to break the fence down and go through it. The older people among us know how effectually Huxley did the breaking down. Science marched right through the book of Genesis. Then Orthodoxy abandoned the "no thoroughfare" position, and said—the Bible was really never intended to teach physical science, knowledge of the mind; its inspiration is to be found in its pure and perfect morality. But this also was an untenable position. The morality of the Old Testament is sometimes too plainly shocking to the conscience of the average unsophisticated man and woman. That, too, had to be given up. That line of fortification was silently evacuated. To-day the average orthodox position is different. The more enlightened section of the Evangelical Churches, for some time now, has given up the infallible inspiration of the Old Testament altogether, and claims that the

Bible is inspired, not because it teaches science, or even in all parts of it the highest morality, but because it contains the record of the life and teachings of Jesus Christ, the divine Son of God. That is to say, driven from Genesis, driven from the morality of the Old Testament, driven even from the morality of some of the New Testament, Orthodoxy has taken refuge in the divine authority of part of the Bible, that part, viz., the Gospels, which contains the life of Christ. This, too, as I have sometimes pointed out to you, is a mere temporary shelter. The retreat will have to be continued until the idea of a divine authority residing in any document is entirely abandoned. And, to my mind, part of the significance of the book which is our present subject lies in the fact that it indicates what will be the next move in the Orthodox army. The next position will be the Bible of Nature. First of all, no doubt, Nature will be represented as a sort of supplement to the divine revelation of Christ, as though there were two divine revelations; and then, the contradictions between Science and the Gospels will become too glaring, and the Bible of Nature will stand alone as the revelation of God. That seems to me the inevitable drift and tendency of present-day religious thought.

I would have you notice, therefore, that the stream of thought is flowing ever faster and stronger towards the very position which we Unitarians took up long ago. So soon as Science made it quite clear that the authority of Scripture was shattered, Unitarians transferred the seat of authority in religious matters to the human mind and soul. Henceforth, whatever happened to the Bible did not concern us religiously. A thing had only

to be proven true to the satisfaction of our souls, and we were prepared, nay pledged, to adopt it into our religion. That is to say, our Bible all along has been the Bible of Nature.

And now we are able to see that the Bible of Nature is in reality a far larger Book of Revelation than the old Bible ever was. We have only exchanged a small book for an infinitely large one; a book of the past for a book of the past, present, and future; a book of one race for a book of all humanity, nay, of all life and all creation. For what is Nature? Nature is only a comprehensive name like God, meaning all things that are, and ever have been, and ever will be. The Bible of Nature is the Universe which lies open in all directions for us to read, as we have eyes to see. It includes our own souls. It includes all that God has made and is making now. It includes all books, sacred and secular, ever written. It includes the wise words and inspiring examples of all grand men and women, of every race and time, for all are divine sons and daughters of God, Jesus Christ among them, and all are alike natural, part of Nature. It includes everything that can possibly commend itself to us as true and beautiful and good.

The Bible of Nature suggests those noble lines of Walt Whitman, in which he says:

"Why should I wish to see God better than this day?
I see something of God each hour of the twenty-four,
In the faces of men and women I see God, and in my own face in the glass,
I find letters from God dropt in the street, and every one is signed by God's name,
And I leave them where they are, for I know that wheresoe'er I go
Others will punctually come for ever and ever."

The Bible of Nature reminds us of what the astronomer Kepler said, as he contemplated the stars and grasped the laws according to which they move: "O God, I think again Thy thoughts after Thee."

The Bible of Nature means an ever-widening revelation, according as each man and woman learns the laws of Nature. It means that we can all hear the voice of God if we will listen to knowledge and experience. It means what Lowell, the Unitarian poet, said long ago:—

"Slowly the Bible of the race is writ,
And not on paper leaves nor leaves of stone;
Each age, each kindred adds a verse to it,
Texts of despair or hope, of joy or moan.
While swings the sea, while mists the mountain shroud,
While thunder's surges burst on cliffs of cloud,
Still at the prophets' feet the nations sit."

II.

THE HISTORY OF THE EARTH.

"In the beginning."—Gen. i. 1.

Everyone knows the majestic poem with which the Hebrew Book of Genesis begins. Biblical criticism informs us that it was, in all probability, the work of some priest of the Jerusalem Temple about the year 400 B.C. If it does not appeal to your sense of grandeur by what itself contains, here is a fact which ought to impress you—that from 400 B.C. down to half a century ago its account of creation, of the beginnings of our earth, absolutely dominated the minds even of the best educated men and women. For over 2,000 years this was the universally accepted account of the early history of the earth. Personally, I cannot help feeling respect towards it for that reason, although to me it is nothing but poetry, the imagination of man, and not, as it was and is to those who so accept it, the God-given revelation of truth. As I shall go on to outline the modern Scientific story of the earth's beginnings and development, it will be well to keep the first chapter of the Bible in mind for purposes of comparison.

It is a story in six acts, each act occupying a day. When the scene opens the earth is pictured as a waste of waters, shrouded in absolute darkness—water and darkness and God. The first act of creation took place when God, by majestic fiat, called forth Light, and saw that it was good. The second act was the heaving up of the firmament of

heaven, with waters above it and waters below it. The third was the division of the waters below into ocean and dry land, and the springing forth of the vegetable kingdom, all by the simple word of God. The fourth day was marked by the creation of the sun and moon and stars, and their fixture in the firmament for measurements of time. On the fifth day the animals of the sea and sky appeared in all their abundance of species; and on the sixth day the animals of the earth, crowned by their lord and master, man.

There is a really sublime simplicity and grandeur in this, marvellous, when you think of it as the work of a man, a Palestinian priest, 2,300 years ago. Orthodoxy actually obscures its grandeur by insisting upon its divine, and not human, character. But I cannot too much impress upon you the profound and radical changes that are at the present time passing over the thoughts of men concerning the history of the universe, changes so radical, so far-reaching, that it is every day becoming more of a simple impossibility for the old theology to continue to exist.

And there, I may as well say, we touch on the ultimate interest of such sermons as this. There exists an intimate relation between our conception of the universe and our theological beliefs. Our theology roots itself in, springs out of, takes the shape of, the theory of the world which we hold. The popular theology springs out of that theory of the world which finds a voice in the first chapter of Genesis. The new theology, the theology of the future, springs out of, and is vitally related to, the present-day teachings of Science. Therefore it is well that everyone should know the teachings of Science.

You may say, what does the history of the earth matter to me? Will it help me to earn my bread and butter? No, it will not. But I hope you are interested in much more than the feeding of your body. The thinking man and woman is beset by farther-reaching problems than those of the moment and the day. Neither you nor I can escape from the questions—whence and whither. In the long run it even touches our daily business, our home life, the training of our children, our politics, whether we believe in an infinite universe of everlasting order and progress, or in an insignificant world which began a few thousand years ago, at the bidding of a capricious deity, and is liable at any incalculable time to a complete overthrow at the whim of the same dread power.

How grand and sublime and awful is the universe wherein we live to-day compared with the notions of our great-grandfathers. How much grander and securer and more hopeful the work and life of man. Six thousand years was the backward limit of the world, and to-day the men of science speak of a thousand millions of years as if that were almost too short for all the slow and patient work of creation. And what has occurred in all that unimaginable time? Let me try in a few minutes to outline the story of one thousand millions of years. A bare outline it must be; but the general order is what most concerns us; and to know that it is not the mere fancy of one man or of a few men, but the result of the patient investigation and continual testing of hundreds of talented men, extending through, say, the last 300 years.

Well, then, in the dark backward and abysm of time we begin with a nebula. If we had a good

telescope, and directed it on that constellation called Orion, four great stars forming an oblong and enclosing a vivid streak of three, we should discover that the middle star of these three is not one but six, surrounded and enmeshed by a cloud of flaming dust. That flaming dust is a nebula, one of the most magnificent of thousands that are in the heavens. A nebula is a vast swarm of meteorites revolving about a central gaseous mass; and from such a nebula our solar system has come to be what it is. The nebula may be of enormous extent. That which was our parent is supposed to have extended from the Sun as a centre to the orbit of the planet Neptune. The central gaseous mass of this nebula in process of time became the Sun, and other concentrations at other points became the nuclei of the planets. And this is no act which took place once long ago, and never again. Even to-day the work of creating solar systems continues. From time to time stars are being born in the same way, and any night a new star may make its appearance in our heavens.

Thus we picture to ourselves that at one time all this space now covered by our solar system was occupied by a thick-sown swarm of meteorites, and that this earth of ours came into existence through the concentration of a portion of this swarm. Thus we have it a molten star, with an atmosphere of gas and steam. Sometime in the course of this star's whirling it threw off a portion of its molten matter, which became the Moon; and the Atlantic and Pacific oceans probably mark the hollows left by the two masses which joined to form our nightly illuminant. Astronomers calculate that this event took place at least fifty millions of years ago.

All this time our star was continuing to cool, and soon after the birth of the moon it grew so cool as to become solid. Then the oceans came into being, when the steam, which was all this time in the atmosphere, cooled to water, and, acting on the ingredients of the crust, began to be salt. And thus we reach the stage of solid earth, of land and water.

But still the cooling process went on, only now with wrinkling and folding and crumpling of the earth's crust, as in a withering apple, wrinklings and ridgings which in this case are the vast and lofty tablelands of continents and the huge mountain chains. The same process is going on in our own day; for earthquakes and volcanic eruptions are but phases of the cooling and crumpling of the earth.

With the advent of water, in the shape of rain and rivers, came another potent cause of changes. The water wears the rocks and washes their debris down to lower levels: the mountains are transplanted into the sea. Yet all is not wearing away; there are conservative agencies at work as well as agencies of destruction. Earthquakes upheave the land that has been washed into the ocean beds. Coral insects build up islands on the tops of submerged mountains. Vast quantities of ooze collect under the water, which, when lifted to the surface, form our limestone rocks. And so we get the earth, with its infinitely varied surface, upon which we now live.

Briefly, then, the story which the astronomers and geologists tell us runs thus—that the earth took form from a whirling crowd of meteorites; that after a stage of intense heat it began to cool and consolidate; that in process of cooling it got its

solid surface, its ocean, and its atmosphere; that as it became older and colder it wrinkled into mountain chains and tablelands; that it was sculptured and chiselled by frost and rain, by river and sea; and so at last became fit to be the cradle and home of living creatures.

This story, let me remind you, is not offered as an infallible revelation, heard by some prophet in his inner consciousness straight from the lips of God. It is offered more modestly, but more reasonably, as a story that has been worked at and built up and tested, and corrected and added to, and taken from and continually improved, say, from Galileo's time, through three hundred years, by specially trained men, anxious only for the truth.

But what about that nebula? some will say. Where did it come from? What of the matter of which it was composed? How did this matter come to be, which is under our feet, of which our bodies and brains are built up? That is one of the wonderful chapters in scientific speculation opened up by the recent discoveries in connection with radium. All matter is resolvable (chemists tell us) into eighty elements, of which radium is one, helium is another, and uranium another. Formerly these elements were supposed to be independent of each other. But now it is discovered that uranium gives rise to radium, and radium to helium, while helium most likely gives rise to lead. Here is a hint that there has been an evolution of matter, and that all the forms of it which we are acquainted with go back ultimately to one simple element, perhaps ether. And that simple element itself—what of it? Well, you know that radium is constantly giving away part of itself, in the shape of

very penetrating rays; now that part of itself so given off behaves just as if it were electricity. It looks as if the beginnings of the whole universe were being resolved into electricity and ether. But man's speculations come to a stop sooner or later; and when we ask, what is electricity, and what is ether, the men of science shake their heads. A land of mystery lies at the back of everything. Not "thus far shalt thou go, and no farther," but "thus far has science gone to-day, with the certainty that it will go farther to-morrow."

Let us stop for a while, and gather up impressions. What now do we think of the universe? What do we think of creation?

(1) Creation is not an act that took place 6,000 or 6,000 millions of years ago and then ceased. Creation is a process still going on. It is a continuous natural development. It is like the growth of a flower or a tree, which, even should it die down, will give rise in death to a new flower or tree, and so ad infinitum.

(2) And what of God? Science itself says nothing of God. Science never brings in God as an operating cause; for the work of science is not to discover God but to describe the course of natural happenings in the simplest possible natural terms. Science does not banish God, as some falsely suppose. Science, as science, does not ask about God; it asks how all this has grown to be, but not why all this has become what it has become. Yet when we go on to ask for the why of all things, the power at the back of things, the life within all things, science helps us. It impresses on us the fundamental mysteriousness of the universe. It impresses on us the order, progress, harmony, beauty, and intelligence of things. It points to the exist-

ence of some Power Supreme, which from the start made things so that they might grow, as it were, of themselves. Science forbids us to think of God as a being outside of creation, working on things from without; but it does not forbid to think of Him as the Spirit, the Life, the Soul, as it were, of the universe, even as a man's life inheres in his body. What part of the body is the soul in? We do not know. It seems to be everywhere. My soul is myself; and so God is the Uinverse, the Spirit, the Life-power of the universe.

(3) How do we know the Spirit, the mind of God? Here, too, science helps us. For we learn the mind of God from the laws of the universe which science unfolds. Those laws are in the very nature of things, and science draws them out, discovers them. They are the essential constituting laws of the universe and of all development and progress. They are the vital laws by which things have grown to be what they are. They are the laws which we must obey if things are to further progress in the future.

(4) Under this conception of the universe there is no place for miracle. The man of science does not care to argue or question about miracle. Miracles seem absurd to him on the face of them. They are ruled out. The laws of the universe are God's own laws, and for God to interfere with them would be to undo with his left hand what he had done with his right.

(5) Lastly, as to the future. The world has grown by vast process of development, in order and beauty, from a swarm of meteorites. What is to become of it? Some people, we know, expect from time to time the second coming of the Lord, with catastrophic convulsion and the violent end of all

things. Science lends no authority to such ideas. Whatever end of the world science foresees, that end will be as far off in unimaginable years as is the beginning. Formerly there were men of science who talked of the earth becoming frozen like the moon, incapable of bearing life, or of the sun itself becoming cold. But all such speculations have been profoundly modified by the discoveries in connection with radium. It is now found that the earth is self-heating as well as self-cooling, and that there are regenerating influences at work everywhere, so that we must picture the universe as in process of eternal reconstruction as well as in process of eternal decay. Change, everlasting change, but no destruction, seems the lesson of science; change on the surface of things, but eternal continuance at their heart. We need not harbour a fear about the future of our world, even if our life is bound up with its existence, which is not, perhaps cannot, be proven. Science tends to put its ultimate destruction farther and farther away, and it may well be that, in point of fact, we do not know, and shall never know, the end of the world, even as we do not know, and probably shall never know, the absolute beginning of the world. "The Universe is God in one phase of Him, and possesses His attribute of eternal duration."

III.

THE ORIGIN OF LIVING CREATURES.

"The Tree of Life."—Gen. ii. 9.

We are touching on some of the most difficult problems that weary the brain and burden the heart of thoughtful men and women. I claim no special knowledge. I shall take what Professor Thomson says, and yet I shall not confine myself to what he says. Out of many books which I have read, I shall cull what facts and thoughts come to me as helping to make clear and plain the present-day teachings of science on the subject of the origin and nature of life. Do not imagine that we shall be able to settle offhand a question like this, which has been one of the standing puzzles of the ages. And yet, as the world grows older and wiser, it does approach nearer, I believe, to a solution. There is nothing unknowable—it is only at present unknown. We are finite beings in an infinite universe, and in that is at once our hope and our despair—our despair, so far as solving all our problems within our own lifetime; our hope, as showing spread out before us a boundless field for research, an endless line of inquiry and increasing knowledge for every human soul.

First, let us recall that ancient story in the second chapter of Genesis, partly to explain the sense in which I use the words of the text, partly for purposes of comparison with the scientific account of the origin of life. There are two Bible accounts of creation, different, made by different authors, writ-

ten at widely different times. The first account we had in the previous sermon; the second, which is the older, I take for our present purposes, because it is fuller in its particulars with regard to living things.

According to this ancient, naive account, popularly known as the story of the Garden of Eden, the earth in the beginning was a dry and barren desert. There was no rain. First of all, therefore, a mist came up and watered the earth. Then God took some dust of the ground, shaped it into the form of a man, breathed into the nostrils of this clay image, and it became a living soul. The next act of creation was for God to plant a garden. Out of the ground He made to spring up every tree; and then, for purposes of man's companionship, every form of animal life; and, lastly, finding them not sufficient, God took one of the man's ribs and from it created the first woman. How many thousands, and hundreds of thousands, still tenaciously adhere to that childish myth of the origin of the living creatures on the earth! In the midst of the garden was the tree of life, meaning a tree of immortality; for whoso ate of its fruit was supposed never to die.

I want for my present purposes to take that phrase out of its context and to attach another meaning to "the tree of life." Leaving the old legend altogether, and fastening our attention on the multitudinous variety of living creatures which we know, the legions and legions of kinds and species, swarming on land, in sea or air, partly of animals, partly of plants, from bacteria, that require a powerful microscope to see them, to the huge elephant and whale—I want to suggest that all these countless varieties of living creatures may be

pictured, symbolically, as a gigantic tree. There are very simple forms of life, not merely minute, but simple, with none of the specialised functions we possess: these we should picture as at the roots of the tree. And as we ascend the trunk, we should have branches spreading out at different levels, each corresponding to a species of living creature, each twig even representing a form of life: mosses and ferns and trees; sponges, snails, insects; fishes, snakes, birds, mammals; and, lastly, on the crown and topmost branch of all, the family of man. That is what I want to suggest by "the Tree of Life." Try to form for yourselves, in your own minds, such a picture of all the living things you know. It will help you to realise the vast variety of life; and it will suggest to you one of the most important discoveries of modern time, viz., the fact that all these countless varieties of life, apparently so different, are intimately connected one with another, one kind leading on to another higher in the scale. But I must not dwell on that, for the Origin of Species will be my next subject. It is only necessary to emphasize one thing, that the science of life draws no dividing line between animal life and vegetable life. We must not regard trees and grass and moss as merely half alive, or less endowed with vitality than the bird that flies or the cat that catches the bird. No hard and fast line can be drawn between the two kingdoms. One merges into the other. Insensibly you cross the border, and do not know when you have quitted the realm of animals, and when you have entered the realm of plants. The ultimate structure of both is the same. Plant and animal are alike built up of minute cells, and the simplest forms of life consist of one single cell.

Let us examine one of these simplest forms of life. Some water and mud from a pond are allowed to settle in a glass. A portion of the surface of the sediment is then placed under a microscope; and there, among many wonderful things, you will see an irregular mass of matter, ploughing its way along, sending out blunt protuberances like fingers, recoiling from some objects, clasping hold of others. It is the amoeba. Consider it. It can feel, it has sensation. It has the power of spontaneous movement. It has the power of assimilating food. It has the power of growth. Crystals also grow, but not by assimilation; they grow by laying on layer after layer of the same substance; the living amoeba grows by changing different kinds of substance into its own substance. Lastly, the amoeba has the power of reproduction, so that its line of life is continued day after day, year after year, aeon after aeon. Those are some of the essential qualities that separate living things from dead things. It used to be thought that the movements of the amoeba were mere movements, like that of the earth almost, mere dull attractions and repulsions. But it has been shown that the humblest creatures sometimes exhibit the first hints of mind. They try one thing after another, and select one that is fit, in the same way as Darwin found that the earth worm in drawing a leaf into its burrow tried one end and one way after another. We are led to say, therefore, that just as life runs down much farther in the scale of being than we used to think, so mind, intelligence, runs down much lower than we used to imagine.

Let us now raise the question, where did this life come from? Can we trace anything in regard to its origin? Recall what I said previously about the

history of the earth. No one doubts that at one time, during early periods of that history, before the earth solidified, the conditions were impossible for such life as we know to exist. No life such as we know could exist upon a molten star. At some uncertain, but far, far distant date, living creatures appeared upon the earth for the first time. How did they come to be? The plain answer may as well be told at once—we do not know. But I must hasten to add that the simple negative, thus stated, entirely fails to do justice to the present position of science. In our present state of knowledge there seems to be a decided break between living creatures and not-living matter. It is a simple fact of experience, to which no exception has been discovered, that living beings originate always from other living beings, never from not-living matter. So far as man is aware, no form of life has ever been observed to arise except from a living parent. If a cheese is left in a damp place, a living mould grows upon it, as it seems, by spontaneous generation, apparently out of the substance of the cheese. But it is only apparently so. No such thing has been observed as spontaneous generation of life. There is a gulf not yet bridged over, between living creatures and non-living matter.

Now some people point to this triumphantly as to a collapse of science. They believe that science will never be able to bridge this gulf. They say, "here is the very hand of God." They hold that the first appearance of life upon the earth was due to a special creation of God. But to science such a position seems a refuge of needless despair.

There are numbers of able scientists experimenting on this very problem now; and what they say

is this—that while there is no evidence as yet of not living matter giving rise to living organisms, this does not exclude the possibility either that it once took place, or even that it is actually taking place now, invisible to our sight. Some while ago one of these inquirers, an Englishman, Mr. Butler Burke, announced that by placing a quantity of radium salts in sterilized bouillon, he obtained transient little bodies which showed many signs of life. He called them radiobes, and claimed that while they are not fully living bodies, they are on the border-line between the non-living and the living, one stage in the development from matter to life. And the significant thing is that Mr. Burke's announcement, premature as it proved to be, caused no surprise in the scientific world, the fact being that those who know most about the subject are prepared for the discovery that there is no break between the living and the non-living. Science holds the opinion to-day, though it is merely an opinion, that as to the origin of life, either long ago at a certain stage in the cooling of the earth conditions were such as to make it possible for matter to develop into a low form of life, from which low form all our present forms are descended; or else that even now, in as yet unknown places and conditions, such lowest forms of life are being still produced from so-called dead matter. Personally, I am much inclined to believe that such a discovery will one day be made.

Let us then face the possibility. Suppose that to-morrow it should be announced and incontrovertibly proven in some chemist's laboratory, that life can be produced from matter that is not alive. What then? It would threaten to take away our breath for a time, and seem to do away with the

very need of God. Is man taking the place of the Creator? we should ask. But further consideration would diminish the force of the shock. At the back of all would still be God. And more than that: Suppose that what Tyndall said in his Belfast address proved true, that in matter is the promise and potency of all terrestrial life, what conclusion should we be driven to ultimately? Why this—it would be proved that the gulf ordinarily assumed to exist between dead matter and living creatures is purely imaginary. There would then be no such thing, in ultimate reality, as dead matter. There would be no single infinitesimal particle of matter throughout the infinite universe that is not pulsing with a part of the infinite life. The result would be not to degrade life, but to ennoble that which has hitherto been despised. There would be nothing dead. And what would this mean? Translated into the language of religion, it means—the one God and Father of all, in all, and through all, everywhere living, everywhere active, everywhere creating. Life is a tree, a perpetually growing thing; and wherever life appears it is the natural outflowering of the infinite and eternal life of the universe, our God and Father.

Then one other question for the last. This is Easter Sunday, commemorative of our belief in Immortality. This day we say, "Death does not end all." It is natural to ask, how does this scientific view of the origin of life, which makes it a development out of matter, affect our belief in the immortality of the soul? If it turned soul into matter, there might be fear. But when, as we have seen, its effect is to give to matter some of the potencies hitherto exclusively reserved for soul, there seems

no fear at all. The doctrine of science affects our belief in immortality in no way, except it be to make it more believable. To my mind, the scientific story of creation adds a thousand-fold to the dignity and worth of the living soul. This life of mine is the outflowering upon the topmost branch of a tree of life, whose stem and trunk and roots go back and back and back through millions and thousands of millions of years—an outblossoming of that eternal life we call God. The tremendous idea of immortality is all the more likely therefore to be true. Science is further than ever from proving that the inextinguishable hope of immortality is false; rather does it point to a more extensive immortality than we believed in before; and I need hardly say that if we be compelled to extend the idea to creatures lower than ourselves on the tree of life, that does not make one whit less probable the idea as applied to man.

This great faith, so natural to the human heart, so satisfying to the human mind, is still in possession of the field. No proper warrant has yet been shown why it should evacuate. No one need apologise for his belief in Immortality. Butler Burke himself, in the course of the book in which he expounds his experiments on radiobes, says, "Our descent from protoplasm, and its descent from simpler matter, need raise no fears as to our future life."

IV.

THE EVOLUTION OF LIVING CREATURES.

"God made the beast of the earth after its kind, and the cattle after their kind, and everything that creepeth upon the earth after its kind. And God saw that it was good."—Gen. i. 25.

I have unfolded the story of the Creation of the World, as told by modern science, and of the Origin of Life upon the planet. We now come to the subject which is particularly associated with the name of Chas. Darwin, viz., the Origin of Species, the evolution of the living creatures which swarm upon the earth.

We are all lovers of animals, not merely our own house-mates, but also many that are not tameable. And while we do not love all animals, there are few of us who are not interested, one way or another, in the countless varieties of living creatures. We love to watch the birds. There are few boys who have not made some study of frogs and tadpoles. We all know the industrious bee. The enthusiastic fisherman is not bent merely upon adding to his food supply; he loves to observe the forms and habits of the creatures he catches. We all love to get close to the life of Nature.

If we let our mind rest for a moment upon what we have seen and what we have read in this respect, one of our first and strongest impressions is the immense variety of life. What a contrast, e.g., in size between the invisible bacteria and the whale; in shape between the bird and the elephant; or be-

tween the trout and the man who angles for it. Their manifold forms and colours and habits arouse in us admiration and pleasure. But in time this marvellous variety begins to touch not merely the senses, but the intelligence; it arouses our curiosity; we seek its cause; the problem of origin faces us. And this is the point where we reach the world's particular interest in Darwinism. This fact of the infinite variety of the forms of life requires an explanation.

Here let me interpolate a word suggested by the widespread interest taken in Darwinism, and the enormous change wrought in the world's ways of thinking by it. Darwin's book, "The Origin of Species," is strictly and solely biological. It deals only with the problem of the origin of the kinds of life. You would think, therefore, that its influence would have been confined to students of Natural History. But whenever a great truth is discovered in any one department of science, it spreads to all departments of human activity; and we never know how far it will go. It is not safe to neglect any scientific truth. The explanation given by Darwin of his own special problem has been found applicable to many other problems, some of them very close to every man's business and well-being.

The fact to be explained, then, is the Infinite manifoldness of organic life. We seek some explanation of how this wonderful complex world of life has become what it is. It is marvellous to me how many people continue to disbelieve in Evolution. Let us look for a moment at the theory we are asked to adopt if Darwinism be not true. It is the creation theory, or, rather, the special creation theory. What it says is, that God made each

species of living thing by a special act of creation; that He brought together, somehow, particles of matter that became shaped into the forms of all the different species of animals we know; and after each was so shaped, He, by direct act of creation, conferred life upon it, and made it capable of propagating its own kind; at one moment a lump of matter, at the next moment a fully-grown whale, a fully-grown horse, fly, fish, man, on through the long list of living creatures; each species remaining distinct and separate from the beginning to the end of life. And when the fossils in the rocks are pointed to, the holders of this theory go on to say that there has been a succession of cataclysms, like the Deluge, in which the old species were killed off, and after each cataclysm God began afresh. When I tell you that over a million species of living animals exist, you will see that it must have been a busy time during those first few days of creation. Moreover, it is utterly inexplicable why God made some so almost identical with others, as well as some so widely different from others. And, lastly, it is plainly false that one species remains for ever the same. New species of flowers, new species of horses and cattle, are being, even now, produced out of old species, under our eyes, as we might say. The special creation theory has not a single shred of fact in support of it.

The only theory with any evidence in its support is the Evolution theory, the theory of Descent. What it says is this: The plants and animals now around us, all known forms of living things, have sprung one from another, by natural processes working continually throughout the ages. The forms we see to-day are the lineal descendants of ancestors that were simpler in form; those simpler

forms were descended again from ancestors simpler still; and so on, backwards and backwards, each generation of species united by heredity with the preceding simpler generation, until we lose our clue in that unknown origin of life, on which I discoursed to you before. That is the theory of Descent. I do not say that it is utterly and entirely verified, like the law of gravitation. But it is the only theory that holds the field with scientific inquirers. It agrees with all the facts we know; whereas the other theory has no fact in its favour. And every year the facts accumulate to confirm the evolutionary hypothesis.

Darwin collected a great deal of evidence, an abstract of which he submitted to the world in his Origin of Species; so much evidence, that after a few years he converted the scientific world. Much more has been collected since. Just let me illustrate it along two or three lines. When I was in London I used to visit the great Natural History Museum; and I remember one case of stuffed birds, pigeons perched on a tree, all the varieties of domesticated pigeons, fantail, pouter, tumbler, carrier, etc., etc., so different in size, shape, colour; and in the middle of the case was a specimen of the wild slaty-blue rock pigeon, not unlike our own wild New Zealand pigeon, only smaller. Seeing them together like that, you could hardly resist the conclusion which Darwin drew, that this wild rock pigeon was the common ancestor of all the rest.

Again, one of the most striking facts is this:—Geology has helped us to a history and pedigree of some animals, e.g., the horse and the elephant. Take the history of the horse as told by Professor Ray Lankester in his charming volume on Extinct Animals. In early geological strata are found the

remains of a small quadruped about the size of a sheep, with all the characteristics of our horse, except that it walked upon five toes. In the succeeding epoch the same quadruped is found, a little larger, but with four toes. In the next it has three toes. Through the next ages the two side toes continue to dwindle, and the middle toe to enlarge; and now, if you examine a horse's hock, you will find two little splint bones at each side of the leg, the remains of those former side toes; and you will see that the hoof, which the horse runs upon, is, as you might say, the nail of the middle toe. In a similar way, from fossils now found in the dry sandy soil of Egypt, the pedigree of the elephant has been traced, through ancestors that lead back to an animal which has no trunk and no tusks, is smaller in size, but in all other characteristics is our well-known elephant. Can you imagine any more convincing demonstration of the reasonableness of the theory of Descent?

I remember reading a book that had pictures in it, of course made-up pictures, of the kind of things that existed in different geologic periods. Let us imagine the different ages into which geology divides the earth's history, passing thus before us, as it were, in a kinematograph. In Cambrian times we should find many forms of life in the ocean, chiefly a small extinct shell creature, the trilobite; but on the land no form of animal. In the following age we should see fishes swimming about, but still no land creatures. When we reached the Old Red Sandstone we should for the first time see insects flitting among the branches of the fern and other trees. At the end of the Primary era we should have lizards and reptiles, animals which flourish on both land and sea, a promise of the coming of

the warm-blooded vertebrates. With the Secondary age we should meet those immense, interesting, extinct animals, the very names of which carry terror, apart from their size: Ichthiosaurus and Plesiosaurus, half fish and half lizard; Pterosaurus and Megalosaurus and Archeopteryx, half reptile and half bird; and among these terrible monsters might be seen, for the first time, mammals resembling the Australian kangaroo. Leaving the great Reptilian ages behind, we should next come to those more recent times when the ancestors of our own present species appear on the scene: the ancestor of the horse, already described, the ancestor of the elephant, the first monkeys, and a thousand other of our best-known higher animals, while the former dread inhabitants have disappeared. Last of all, in the most recent period, geologically speaking, which is, say, two or three hundred thousand years ago, we should, as our kinematograph picture flashes past, see ourself, the first man.

Such is a hasty skeleton sketch of the history of animal life, as disclosed by the science called palaeontology. Looking back over it all, who can escape the impression of a gradual ascent of life? Who can avoid the conclusion that the history of the organic world is a history of progress, in which one kind and species disappears, after giving birth to another kind higher up in the scale of being, and better fitted to fulfil the changing conditions of life? True, it is a history with many, many gaps; but we have to remember how young the science is, and how fast the gaps are being filled. Let me quote some words of Professor Ray Lankester in this connection: "In looking back over the advance of science in the last twenty-five years, it seems to me that we must say that the conclusions of

Darwin as to the origin of species by the survival of selected races in the struggle for existence are more firmly established than ever."

The struggle for existence! The mention of that phrase leads me to a most important subject, the ethical and religious bearing of the tale of life just told. I wish I had time to read to you all the illuminative remarks which Professor Thomson makes in "The Bible of Nature" on this much-misunderstood topic. There is no point on which Darwinism has been more misunderstood, even by those who believe in it. Perhaps Darwin himself lent something to the misunderstanding. It makes a world of difference to the religious aspect of the scientific doctrine of evolution when it is cleared away. What I mean is this:—I have no doubt many of you have read Winwood Read's "Martyrdom of Man." That book was written partly under the influence of personal suffering, partly under the influence of Darwinism. The view of Nature which it presents is a frightful one; nothing but a bloodthirsty scramble for the necessaries of life. It is a commentary on Tennyson's famous line, "Nature red in tooth and claw with ravin." That book has frightened many a man and woman from a religion that is based on science. It has driven many a man from religion altogether. "If that is God," they say, "if He has brought about Progress and Evolution by so much suffering, by the struggle for existence, this fight round a platter, this relentless, bloodthirsty war, this competitive scramble, then, if there be a God at all, He is a monster of cruelty, and no Beneficent Father in Heaven. If that be the God of modern knowledge, then Christianity is simply not true."

Professor Thomson devotes a good many noteworthy pages to showing that this view is based on a complete misunderstanding. The bloodthirsty and competitive phrase "struggle for life" only describes part of the fact; but, unfortunately, we have no better with which to replace it. Much of the story of life seems a relentless and cruel war. There are certain species of flies which reproduce so rapidly that in the course of a few months, if none were destroyed, a single pair would stock the world. Yet the number of survivors remains much about the same from year to year. That shows how many must perish. So with the fishes; so with the mammals; so with man; each in its own degree. Sometimes it does seem cruel, as when rival stags fight to the death for a mate. But sometimes it cannot possibly involve cruelty, as when the struggle is between snails and plants, which shall survive in a garden. Sometimes it is not even competitive, as shown by the facts of mutual aid, gregarious life, and parental care.

It is very plain that it is not relentless and cruel self-assertiveness that comes to the top in the struggle of Nature. Looking at the whole history of life on this planet, I think three great stages of evolution stand out pretty clear:—(1) There are ages during which the most influential power on earth was the power of brute force; muscle was king, and might was right. The strongest cock ruled the roost. This lasted for ages; and it survives still among many animals, and also, alas! among large sections of mankind. (2) Then the force of evolution exalted brain, intelligence, first in the low form of cunning, or ability to outwit an enemy, but at last reaching up and up till pure intelligence, foresight and insight, intelligence

working for the welfare of others as well as self, became king. Animals found the value of combination; gregarious birds became able to hold their own against even an eagle. The monkeys, though small and weak individually, grew strong in their bands. (3) This pointed and led to something better still. The process of selecting the best continued, and the premium was placed, not on teeth and claws, not on beak and talons, not on strength and cunning, but on "the milk of human kindness," the warmth of maternal and parental affection, unselfishness, love. The supreme attainment, in other words, of the selection process is intelligence and love, and this is seen even in the animal world, though it stands out most conspicuously in the human world. The supreme lesson of the story of life on the earth is that love pays; not "each for himself and the devil take the hindmost." Unselfishness pays. Let me emphasise this most important matter by a quotation from Professor Thomson: "If we wish to draw any ethical deduction from the course of organic evolution, we must have all the facts before us. We must not make an idol of a phrase. We must go to Nature herself. When we do so we find indeed that there is often competition to the death, much pain and suffering; we may echo Darwin's sad words, that the world is too full of misery. But this is not all. We see the success of self-sacrifice, the rewards of love, the power of societies, and no end of joy in life. Progress depends on much more than a competitive squabble round the platter. The struggle for existence is much more than a war to the death between rivals. It includes multitudinous efforts for self and for others. Self-sacrifice and love are

most important factors in evolution, and egoism is not satisfied until it becomes altruism."

Remember, therefore, that Winwood Read's and Huxley's and Tennyson's pictures of the cruelty of the process of evolution—Nature red in tooth and claw—has been corrected by later science. Nature is our great teacher and example; and Nature's teaching, as interpreted by science, is not "Everyone for himself and the devil take the hindmost," it is not might is right, it is not the worship of brute force, selfish unscrupulousness and cunning. The lesson of Nature is that self-sacrifice, mother's love, father's care, the sinking of the individual's interests in the interests of the herd or the hive, the family or the state; these non-competitive qualities and forces have their place at the top of the tree, are the ones which enable the higher creatures to survive, even in the struggle for existence with muscle, and beak and talon, and tusk and brute force and massive strength. "Blessed are the meek, for they shall inherit the earth." Those lower forms of life are tending to disappear, and their place is being taken by weaker and smaller creatures, physically, but stronger in pure intelligence and love.

And the God who has made it so can be neither a monster of cruelty nor indifferent to the truest welfare of His creatures.

V.

MAN'S PLACE IN NATURE.

"How much is a man of more value than a sheep?"—Matt. xii. 12.

It is my purpose to consider, in the light of science, what sort of beings we men and women are, and what is our place in the scheme of Nature.

I say in the light of science, because, to my mind, science gives us the facts from which we must reason to our general scheme of knowledge. If we want to have our views, our theology, broad based on facts, we must build it up with the materials quarried out by the strict methods of investigation pursued by science. Nature is our only Book of Divine Revelation. Let us go to Nature for our facts, and thence each man build up for himself, by his own reasoning, his general body of beliefs. Do not imagine that I am laying down any new infallible system of belief, to replace the old infallible systems of orthodoxy. I do not want you to take my word for gospel, or the word of any man. What I aim at is to give you a few hints (hints are all one can give on a vast subject in a sermon's span) as to how scientific investigation is trending, and what are the generally accepted conclusions, drawn from the facts discovered, by the trained thinkers of our own day.

First, let me remind you of what we have already done. We have traced the manner in which this solar system of ours has grown, from star dust to a system with the sun in the centre, surrounded by its planets, of which our earth is one. We have

seen how this has grown by orderly process, following an intelligible line of progress, that is plainly observable by man in its broad aspects. We then saw how, through as yet uncounted ages, our earth underwent changes, which made it capable of being inhabited by forms of life, such as we are familiar with. We could not place our finger exactly on the beginning of life; but from the moment that the first simple form of life appeared, we traced the same orderly movement and lift, following lines of intelligible order and growth, climbing up and up, through the various and multiform structures of living things, until man was reached. That is where we take up the parable to-night. What is man, his origin and nature, and his place in the general scheme of the universe? What has the latest science to say on this subject?

Here, I need scarcely remind you, is where we meet with the most stubborn prejudices, the most unyielding struggles between the old views and the new. I read in a Manual of Instruction, issued for members of the Anglican Church, that "upon the sixth day of creation the work was crowned by the appearance of the human race. God said, let us make man in our image, after our likeness. In the use of the term 'us' in this passage, we learn that the Blessed Trinity conferred together concerning the creation of man. This conference marks man's special dignity, for there is no record of such an action on the part of God in calling the lower creatures into being. Man was made in the image and likeness of God. The likeness was well-nigh, if not altogether, lost at the Fall." Such is the view of man's origin and nature still being taught in orthodox churches. In the case of the lower animals, it is admitted that a gradual pro-

gress from lower to higher forms of life is discernable. But when we come to man, his creation was on an entirely different plane, belonged to an entirely different order of events. Man was made by a special act of creation, after special conference of the heavenly powers, and in the image of God, though he only retained that image of perfection a short while. I could demonstrate to you how the whole scheme of Orthodox theology and ecclesiastical practice depends upon, and springs out of, that view of man's origin and nature. But that would lead me aside. My object is to give you the leading facts and inferences of science, and you can draw your own conclusions as to Orthodoxy.

Well, then, science says right out that man, in the first place, whatever else he may be in addition, is an animal, and if we could put away prejudice and misconception, science would be seen in this case to be nothing but glorified commonsense. Zoologically regarded, says Professor Thomson, man belongs to a special family in that order of mammals which we call Primates, which includes marmosets, monkeys, and anthropoid apes. The most superficial observation is enough to establish an extraordinary likeness, especially with the last-named. It has been pointed out that man shares with the chimpanzee and the gorilla some three hundred structural features which are not possessed even by the lower order of monkeys. We might well ask any one who still prefers the old view of special creation for an explanation of this very extraordinary resemblance. If God made an entirely fresh departure from the animals in the creation of man, after special conference with the Son and the Holy Ghost, what was the object in creating man so tantalisingly similar to the ape? I can

imagine no reason except to baffle and mislead scientists.

But does this resemblance imply relationship? Is the resemblance merely superficial? I shall mention two recent discoveries which make clear how close is the tie. One is, the discovery of a whole series of diseases, common to man and the apes. This fact points to a similarity not merely of shape and skeleton, but of flesh and blood constitution. The other points in the same direction. It is now known that the blood of each species of animal differs radically from that of every other; and a method of distinguishing them has been found. When the blood of a dog is injected into the blood vessels of a cat, the red corpuscles of the cat's blood are destroyed. But if the dog's blood be injected into another dog, no such destruction takes place. It is desirable, let us say, to find whether a certain blood stain has been caused by the blood of a man or of a dog. It is only necessary to make a solution of the stain and to inject it into a dog. If the destruction of the red corpuscles takes place in the dog, the blood must have been that of some other animal; if the corpuscles are not destroyed, the blood is canine. Now the astonishing and significant fact, for our purpose, is that the blood of the ape acts in the same way as human blood. The blood of the ape and the blood of the man are identical.

In face of many such facts as these, scientists say, not that men are descended from monkeys, but that the ape, the higher monkey, and the man are derived from a common ancestor now extinct. Broadly speaking, in the great family of living creatures, man and the ape are cousins, we cannot and need not say how many times removed.

A similar conclusion is forced upon us when we trace back the ascertained history of mankind, noticing, e.g., as we get nearer and nearer to the primitive savage, the increasing likeness of the human skull to the type of skull found in the ape. It is true that the missing link has never been found: but where two long lines so plainly tend to meet as in the case of the upward line of animals and the downward line of man, when traced backwards, the actual link of connection is of very little practical value.

Many problems remain to be solved. We do not know how the first man arose, or where he arose, or when (though the probability is that his beginninig was hundreds of thousands of years ago). We do not know whether we should not say, first men rather than first man. But the general conclusions as to man's origin is plain—man in his origin is an animal. "Man is a part of Nature, a product of the definite and orderly evolution which is universal." In the course of his development he has departed enormously from his ancestry; he has left all the other creatures hopelessly behind in the race; yet still he remains an animal. Consider how much we share with our fellow-animals! Not merely our physical structure and blood constitution, but also consciousness, the power of feeling, memory, thought, the power of looking forward and expecting something to come. All these things the lower animals have as well as we, in however different degree. They have also the power, in their own degree, of loving, sometimes to a height of self-sacrifice that overleaps the dividing line between animals and humanity and puts the lower stages of the human race to abject shame. Animals have the rudiments of morality;

and, personally, I like to think of the dog, that looks up to its master with such reverential expression in its eyes, as displaying the rudiment of that faculty in man which compels him to look up in spirit to God, his Ideal of Perfection, the faculty we name worship.

Yet the differences between man and the lower animals are so great and so important that we are right in classing man by himself, and justified in saying that the coming of man formed a new departure in the gradual unfolding of Nature's scheme. Morality, self-consciousness, knowledge, power over Nature, love, religion—in these things the differences are incalculable, especially between the animal and the highest type of man. Morality in the highest sense, what is to any right-thinking man the only true sense, the animal does not share with us. The fear of a whipping is what the lower types of man share with the higher animals. But we do not mean morality by that. We mean a clear conception of what is just and right in our relations with our fellow-men, and a desire to mete out to others what is theirs by right as children of God and equal sharers with us of this bountiful earth and its opportunities of happiness. That morality the animals have not. Again, the animals have consciousness, but not the ability to say I, and to ask what am I—self-consciousness belongs to man alone. So also does religion, in the highest sense, the power to realise in thought and imagination the supremely abstract conception of God, and then to bow the head in adoring reverence. That power lifts the man infinitely above his fellow-animals on the earth. I mention these differences to show that I do not belittle our higher nature. But even our highest powers have their rudiments

and beginnings in the animal world; the seed, as it were, out of which the flower was to grow; the egg, out of which the living bird was to develop.

And here I mention the objection which some people bring against this whole scientific conception, viz., that it degrades man. How much nobler, they say, to teach that man was made specially by the hand of God, and in the image of God! Now, in the first place, I have no sympathy with those who judge of what is true, judge of what they must believe, on aesthetic grounds. With me it is not a question of what pleases my sense of dignity, but simply and solely of what is in accordance with facts. The dignity must follow the facts, not the facts the dignity. And, in the second place, man's dignity is totally independent of his origin. It is pure snobbery to judge of a man by his ancestry. Personally, I think more of a worthy man if he be the son of a poor, or even if he be the son of an unworthy parent. The greater is the credit due to him. And, similarly, there is no loss of dignity, really, if we have to regard man as the self-made son of poorer and less worthy parents. There is a general principle here. "The worth of any product is independent of its origin." Its value depends on what it is in itself now, and on what it promises to be in the future.

There are many interesting and important questions with which we might deal in connection with our general subject here; but I must pass them over, in order to end with some practical considerations. How does the scientific conception of man's origin and nature affect our conduct and our highest beliefs?

(1) It gives us an intelligible history of the development of life on the planet. It brings order

into what otherwise is disjointed chaos. It helps us to understand and to unify the facts of the universe. And every thinking man knows for himself the spiritual comfort and power that lie in having even a provisionally intelligible hypothesis of things.

(2) It touches our conduct directly. E.g., we are animals. We ought therefore to be as perfect animals as possible. We ought to look after our health, and develop our physical characteristics to their highest. We cannot share the ascetic idea that our bodies are prison houses of our souls, to be treated with contempt, and starved of their natural possibilities. There are higher things, it is true, than the physical; but the physical is the basis upon which they stand, the foundation upon which these higher things are built. The foundation must be strong, or else the superstructure will fall to pieces; and the higher it rises the more terrible will be the fall.

(3) With regard to our fellow-animals: the scientific view of our intimate family relationship makes for mercy and justice. Yet we have to avoid some errors of extremists here. Some people believe in the pre-existence and transmigration of souls, and look upon animals as sacred because they are the temporary abode of a human soul. Science lends no countenance to such a view. Animals are not human beings in disguise. Whatever rights they have to care and kindness and justice, they have, as animals, fellow-creatures of God, lower than we in the scale of being, yet with their definite place in the scheme of things. Further, we must not be over-sensitive towards animals. They are not endowed with our possibilities of suffering. We must not read our feelings into them. We have no right

to let them stand in the way of civilization, or in the way of surgical and medical discovery. If experiments on animals have helped to save human lives by the thousands, then we must have experiments.

(4) No one can study the marvellous story of creation, as unfolded by science, without recognising the presence of purpose and plan and order in the whole. First nebula, then solar system, cooling earth, life, physical development; then moral development, then spiritual, a wave-like advance, at the crest of which is Jesus and such beautiful human souls as His. We trace the presence and working of a mighty purpose, that includes the microbe and the man, the atom and the star, the infinitely little and the infinitely great. All are necessary to the plan. Now, what follows with direct reference to you and me? Why, this: that my life and yours are definite parts of God's scheme; and that it behoves us to be faithful and true in the accomplishment of that which has been assigned to us. The success of the drama depends on the way in which the least player plays his part. The universe is one everywhere-connected and inter-related whole. No human individuality is without its own special importance. Religion is not wrong in saying, in its own particular language, that God's eye is on every individual soul; and that God hears the prayer of every one of His children.

(5) Lastly, and most important of all, consider what a hopeful, stimulating, zeal-provoking outlook this evolutionary view presents with regard to the future. Think of man's great age, when calculated in terms of our human measurements of time. Professor Ray Lankester says, it is not improbable that man's earliest commencements

date as far back as hundreds of thousands of years. That was our birth: and what are we now? How far on are we in civilization? How far on in science? How far on in practical knowledge of government, in the cure and prevention of disease, in happy co-operation between man and man? In spite of all the progress that has been made, in spite of the fact that the world was never so well off as it is to-day in any department, where is there any sign of contentment, where any sign of our nearing the end? Humanity is in its merest infancy, in spite of its hundreds of thousands of years.

If this, which we see, is its infancy, what will its manhood be? And is not that manhood infinitely worth working for?

Darwin, when describing his theory, first styled it the Descent of Man. He was right from his biological point of view: man's ancestor, the brute, is higher up on the genealogical tree. But the phrase suggested an unfortunate ethical significance, as though history pointed to a decline. Ethically, Darwin's meaning was the opposite; and Drummond expressed this more clearly when he called his well-known book, "The Ascent of Man." Man's infancy has been the story of an ascent, not a descent. It is an ascent to which we can foresee no limits. There is no dream of better things to be, social or individual, too beautiful to be impossible. Man is the heir to a vast and magnificent kingdom, destined by God to be his for the subduing; and, as yet, our army has barely crossed the frontier. Eden is before us, not behind. We are worshippers of the future, and not of the past.

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