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THE SCIENCE OF LIFE
WORTH LIVING.

A Lecture

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ON

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By A. ELLEY FINCH.

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SYLLABUS.

The two theories of the Universe and of Human Life, derived respectively from Superstition and Science.

1. The theory derived from Superstition stated, with indications of its source.

Biassed belief in this (theological) theory arising from early training in creeds, catechisms, and sermons, and from the influence of proselyting societies. Illustrations from the Reports of the Sunday School Union Society; the British and Foreign Bible Society; the Religious Tract Society.

Our actual condition (or practice) of life shown to be based upon the theological theory. Illustrations of its overcrowding, poverty, intemperance, disease, crime, premature death, &c., from the Census Population Returns. The Registrar General's Returns. Fry's Royal Guide to the London Charities. Statistics of Prisons and Lunatic Asylums.

The present attitude of Science in relation to these features of human existence.

2. The theory of the Universe and of Human Life (physiological) derived from Science stated, with indications of its source. Illustrations from Newton's Principia. Darwin's Descent of Man.

Remarkable absence of Societies for spreading knowledge of and inducing belief in the theory derived from Science.

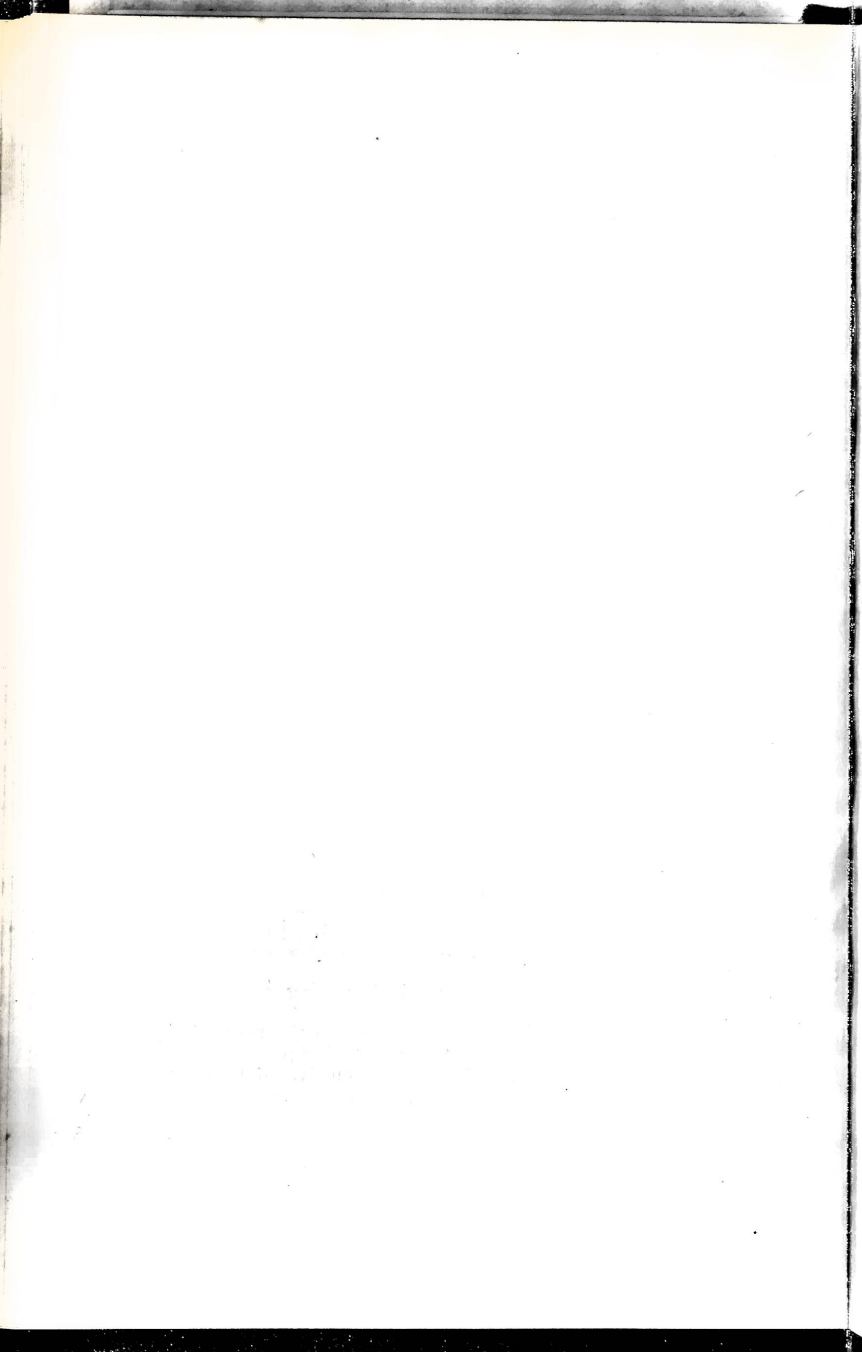
Summary of the Natural Law by virtue of which organised bodies are multiplied in excess of their means of subsistence. Illustrations of the inexorable operation of this law from Haeckel's History of the Creation. Darwin's Origin of Species. Walford's Famines of the World.

The first canon of scientific culture of life involves limitation of numbers, and the controlling of physical conditions of reproduction through the application of human intelligence.

How the continuity or similarity of structure and function between human, animal, and vegetal organisms, enables Science (through comparative research) to acquire knowledge of the nature of the constitution of man, and to originate rules for its right treatment and progressive improvement. Illustrations from Huxley's Man's place in Nature—Galton's Hereditary Genius.

Responsibility (taught by Science) in becoming a factor of posterity.

To what extent, by applying (analogically) to the rearing of the Human Being the scientific methods that have produced the exquisite growth, maturity, and beauty of cultivated Flowers and Fruit, and the joyousness, hilarity, and perfection of form, temper, and disposition of the thorough-bred Animal, the evils of our present existence might be eliminated, its morality purified and elevated, its course converted into a career of virtuous enjoyment, and Life practically made worth Living.



THE
SCIENCE OF LIFE WORTH LIVING.

IN the arena of European thought there are at the present time conspicuous two conflicting conceptions or theories concerning the nature of the Universe, and the origin and nature of Human Life.

One of these theories is based upon supposed Supernatural Knowledge, and, inasmuch as, from the point of view of Science, all alleged knowledge of what transcends Nature relates to the region of the emotional imagination, I will, for the sake of distinction, designate the conception I am now alluding to as—the theory derived from Superstition.

The other conception is one which has slowly emerged from the long series of human discoveries that have gradually brought to light those facts and laws of Nature upon the truth and experience of which it will be found to be exclusively based. I will designate it therefore as—the theory derived from Science.

You all know, more or less, what are the salient points of these respective theories, having probably learnt them by rote. I am going to restate them now, because the argument of the Lecture is founded upon an endeavour to realise them by our reason, and to reflect upon them by way of comparison; notwithstanding that it has become the intellectual fashion with a certain school to encourage subtle and plausible attempts to reconcile these theories—or hopelessly to confuse the separate provinces of reason and faith.

Now the prior-mentioned theory may I think be shortly stated thus—First, with regard to the Universe; that it came into existence by the fiat of the Will of an Almighty Power, which, somewhere about six thousand years ago, created it out of nothing in six days. That the principle part of this Universe consists of the World our Earth, which is a fixed plain or vast floor, arched over by a concave vault. The Sun and Moon, and the Stars which stud this vault or firmament, and which move round the fixed earth, are simply greater and lesser lights created subordinate to, and called into existence for the purpose of the earth, and to give light thereon.

Secondly, with respect to the origin and nature of Man, the theory under consideration is more complex, as well as of more serious interest, and can only be comprehended (so far as human reason can comprehend anything so mysterious,) by entering into somewhat more detail.

It is related then that the Almighty Power created man by forming him out of the dust of the ground, and breathing into his nostrils the breath of life, whereby man became a living soul; and the other sex we are told was created by the causing of a deep sleep to fall upon the man, and the taking out of one of his ribs, and the closing up of the flesh instead thereof; and the rib which was so taken from the man was made into a woman; and this first-created pair were commanded to be fruitful and multiply.

The theory then goes on to relate that the man and woman, thus created pure and sinless, were immediately tempted into sin by Satan in the form of a serpent. That this sin of our first parents brought a curse upon the Earth, and incurred the penalty of death for themselves

and for all their posterity. That the human race thenceforth became more wicked, so that the Almighty repented that he had made man, and destroyed by a deluge all the inhabitants of the Earth, with the exception of eight persons who had feared him, chiefly Noah and his sons; who also were commanded to be fruitful and multiply. This sweeping purification however was as futile as the original design, and men became more wicked than ever, and the final remedy devised by the Almighty for the salvation of his human creatures was the incarnation of himself in the person of his only Son (the second person of a mysterious trinity). That the death of such only Son upon the Cross, the innocent for the guilty, was a vicarious expiation or atonement of the sins of the World; provided however that all this should be believed; faith or belief in it being made the condition upon which alone such salvation is possible.

The theory does not however stop there. It declares that everything which happens upon the Earth is the direct effect of the exercise of the Will of this Almighty Power, so that even a sparrow cannot fall to the ground without his sanction or knowledge, and moreover that the ills of life are to be remedied by means of prayer or entreaty directed to him. Man therefore is emphatically counselled to be constant in prayer; to pray without ceasing. He is assured that the prayer of a righteous man availeth much. That the prayer of faith shall save the sick. That when two or three are gathered in the name of the Almighty he will grant their requests, and that whatsoever any man shall ask Him in the name of Christ (his only son before mentioned) it shall be granted to him.

Then, as to our state of life; the theory inculcates that

poverty on Earth is a condition pleasing to the Almighty, and will be rewarded by riches in Heaven, and that the aim of our life here should be to qualify ourselves for obtaining this heavenly reward. That wealth and happiness on Earth are not therefore the ends in view at all, but are rather obstacles than otherwise to attaining Life everlasting in the Kingdom of Heaven.

That our brief existence in this World is a transitory state of probation, merely accessory or a passage to another, where life will be endless ; eternal bliss in Heaven to those who have believed in this theory, eternal torment in Hell to those who have disbelieved in it.

Such, in short compass, is an outline of the one theory of the Universe, and of the origin and nature of the life of Man.

Now it is by no means easy to point out the source of the theory I have been slightly sketching. It is commonly supposed to be contained in the Bible. Partly no doubt it is so, partly it is even more ancient, for India and Egypt share in its origin with Palestine and Syria. As a whole it is the theory of theology ; that is to say, it has been, in its ultimate shape, elaborated from the metaphysical and scholastic subtleties of that remarkable class of men the *Patres et Doctores*—the Fathers and Schoolmen who flourished throughout the early centuries of the christian era, and during that period of scientific darkness termed the middle ages ; and, so potent has been the indirect influence of their speculative interpretations of the oriental metaphors of scripture, that it is quite doubtful whether any of us now living are capable of reading the Bible free from the prejudices and preconceptions that, partly by inheritance, and partly by education, we have imbibed from such speculations, and which, in the

mystifying form of creeds, catechisms, confessions of faith, and other ecclesiastical devices, are now found to stand between man's unsophisticated reason and the unique language of Holy Writ.

We are educated then to believe in this theological theory, and our belief is not only thus biassed from birth to manhood, but throughout our whole lives the most extraordinary pains are taken to retain our understandings in its thralldom.

It may surprise some of you to hear that there are in this metropolis alone upwards of 150 Missionary, Bible, Religious Tract, Christian evidence, and other proselyting Societies applying large funds and exercising wide ranging influence in spreading the knowledge of, and persuading to the belief in this theological theory. Some idea may be gained of the extent of the operations of these societies if I give you a very few of the published statistics of some two or three of them.

First I will instance the Sunday School Union Society, who, in their Annual Report for last year of what they term their threefold work of pioneering, extension, and consolidation, and the overcoming of prejudices, sophisms, and personal antipathies, state that they have now in London upwards of 830 schools, 20,000 teachers, and 231,000 scholars.

I may here very appositely remark in reference generally to the academical system of this country, that there is not even yet a single one of our great Public Schools that is presided over by a head master who is not a theologian. When therefore we read of a Conference of Head Masters, such as was held on 22nd of December last, we must not be shocked to find that an adequate or more thorough teaching of Science formed no part of their pro-

gramme, and that they should be largely occupied in discussing such subjects as "*de flagellatione corporis*," and "*de cerevisia potendo*"—that is—concerning the flogging of the little boys, and stopping the beer of the big ones.

Next I will take a very few facts and figures from the last Report of the British and Foreign Bible Society. It is therein stated that in the year 1878 the Society had issued and circulated upwards of 3,340,000 copies of the scriptures in whole or in part. That from the commencement of the Society's operations in the year 1804, upwards of eighty-five millions of such copies had been circulated, and they calculate that they have thereby rendered the Bible available to seven hundred millions of the human family!

I will lastly turn to the Report of the Religious Tract Society for the year 1878. There I find it stated that the total circulation from London alone of the various miscellaneous issues of this energetic body had reached the astounding total of upwards of sixty millions, of which 28,500,000 were religious tracts; so that I think we may conclude that the community is tolerably saturated with this species of literature, even if we did not know, what is probably within the experience of nearly every one present, viz.: That you cannot walk the streets without having these publications thrust upon you, and that you can hardly enter a Railway Station or a room in a Hotel throughout the Kingdom which is not supplied with the scriptures gratis, and partly adorned by a display of theological tracts and texts.

We cannot wonder then if we find, as the fact is, that the actual condition or practice of our lives is based upon the theological theory, and that whatever may be the prevalent form of ailment with society or any of its

members, the sovereign cure suggested by our accredited teachers is resort to the theological agency of Prayer, Intercession, or Thanksgiving to the Supernatural Providence assumed by the theory to be specially regulating the affairs of life. Things serious and trivial are alike affected by it.

If bells are to be hung in a Church, they must first be blessed by the ministers of supernatural grace. If a vessel of war is to be named, a christening or theological ceremony must be performed over it. If new colours are presented to a regiment of soldiers, the approval of the supernatural must be invoked. If an epidemic prevails, prayer is to be resorted to to drive it away. If the weather is such that the crops will not ripen, the supernatural is appealed to to change it. If, notwithstanding such appeal, the weather continues disastrous, the crops are destroyed, and the farmer is ruined, so inveterate are our theological habits that a harvest Thanksgiving to the supernatural must nevertheless be held!

Even the sick room is overshadowed by this superstition, and sometimes becomes converted into the chamber of death, by reason of the physician's skill being baffled, not by the symptoms of the disease but by the patient's nervous depression and anxiety resulting from terrified belief in the theological theory.

And now, if we turn to the characteristics of our life carried on under the influence of this theory, what do we find them to be? I think I do not err if I describe them as being for the most part divers forms and shapes of misery, and variety of wretchedness—I am not of course alluding to the lives of the upper ten thousand, who are by their special circumstances exceptionally placed in relation to any theory, but I am referring more particu-

larly to the lives of the masses of those who compose the middle and lower ranks of society.

In verification of this assertion I will again appeal to the irrefutable logic of statistics. If we turn to the Population Census returns we find that whilst, in the judgment of the Registrar-General (whose conclusion I may add is confirmed by the reasonings and research of our friend Dr. Richardson), the fair natural limit of the life of the human being is stated to be 100 years, yet the average length of life in this country, taking all of us together, is only between forty and fifty years, whilst, if we confine our calculation to those who constitute our toiling millions, their actual average length of life is only between twenty and thirty years. It may be literally said that the natural length of life is ground out of them by over-work, by overcrowding, by intemperance, by disease, and by destitution. So short a span of existence can indeed be to many of them little more than the prolonged agony of a slow death. "We don't live,"—said many of the street folk to Horace Mayhew, when he was enquiring into the habits of the London poor,—“We don't live—we starve.”

Again, in the Registrar-General's summary of births, deaths, and marriages for the year 1878 we find it recorded that out of the 83,000 deaths that occurred in London in that year, upwards of 42,000 took place at ages under twenty years, and it appears as a general inference from his figures that of the children that are brought into existence upwards of 40 per cent. of them perish under five years of age!

Now these are very fearful facts, in whatever light we may view them, and the amount of human misery they involve can hardly be realised by means of language.

though if it were necessary to paint with sadder colours the sorrows of our existence I would refer to Fry's Royal Guide to the London Charities, amongst which are enumerated no less than some seventy Hospitals, having an annual aggregate of nearly 1,000,000 in-and-out-door patients!

All honour indeed to those whose munificence supports these beneficent Institutions, but, what we are now concerned to notice is the appalling mass of disease and destitution that renders them necessary, and fills to overflowing their tens of thousands of beds and appliances.

I might even still further darken the picture of life if I summed up, however briefly, the statistics of our habits of intemperance and the numbers of committals to jails and of the inmates of lunatic asylums; but I think that what I have stated may at any rate be regarded as sufficiently justifying the Apostle of Superstition, who has lately been heard to enquire so despairingly—Is Life worth Living?

Now, remembering that in obedience to the theological theory millions of prayers, in every conceivable variety that the will of man can devise, have been, and are being continually uttered imploring supernatural relief from the evils of this world of woe, I think we might well reply to the above enquiry by asking—Is it not time seriously to try something else?

There is no doubt that in one sense enlightened minds have been for a long time engaged in endeavouring to lessen the ills of life by the application of the teachings of Science. Philanthropists have especially sought to show that in matters relating to health, diseases for instance, chiefly result from the disregard of certain natural laws; but, between Superstition and Science there

is really no ratio, and, whilst the one appeals to supernatural Providence for the cure of evil, and the other would rouse up the human reason to discover the law of nature which the presence of evil shows us has been disregarded, it is in fact impracticable effectually to graft the resources of science upon the theological theory, and, in attempting it, we are only engaged in the delusive practice of pouring new wine into old bottles. The old bottles of theology are indeed from time to time burst, while the new wine of science is mostly spilt and lost.

Not but what a summary of the achievements of science during even the present century would show us very remarkable changes bearing upon the progress of our every day life,—commerce freed from restrictions; trade monopolies broken down; the necessaries of life cheapened; important political, economic, and legal reforms effected; locomotion and the means of communication marvellously expedited; vast improvements in the medical art; pain mitigated, diseases diminished, life itself lengthened. Yet the conclusion I desire to put to you is, that the expected beneficial results of these scientific achievements have been more or less neutralized or impeded through the influence of the theological theory, by the stimulus they have thereby been encouraged to impart to the irrational and reckless over production of human beings, so that their most striking effect has been the excessive, that is, the too rapid increase of our population, especially of the indigent or wage receiving class, whose miserable lives and untimely deaths are but too surely vouched for by those remorseless returns of the Registrar General.

It appears by the published digest of the last census that the population of England and Wales, which, in the year 1801 was nine millions, had doubled its numbers by

the year 1851, and, by the year 1871, had increased to twenty-three millions !

Then in relation to our education on the theological basis, the attitude of science is thus humourously described by Professor Huxley. "The educational tree," he remarks, "seems to have its roots in the air, its leaves and flowers in the ground, and I confess I should like to turn it upside down, so that its roots might be solidly embedded among the facts of nature, and draw thence a sound nutriment for its foliage and fruit of literature and of art. I think I do not err in saying that if Science were made the foundation of education instead of being at most stuck on as a cornice to the edifice, the present state of things could not exist."

Let us now turn to the consideration of the theory of the Universe, and of the origin and nature of Human Life which we have derived from the discoveries of Science.

When you look up at the sky on a bright clear night of course you see the vast apparent dome over your heads profusely studded with constellations and multitudes of stars. You observe that the great majority of these appear to be fixed in their relative positions, always appearing in their accustomed places, no matter where the observer may be, but that with regard to some few of the stars, which appear to be larger than the rest, and to shine with a more brilliant and attractive light, these you observe to be perpetually shifting their positions, only some of them appearing together on any particular night.

Now the marvellous discoveries of astronomical science respecting the stars are shortly this. Those that are never seen to move out of their relative positions, and therefore called the fixed stars, are at an enormous,

practically an incalculable distance from the Earth, and are of vast size compared with it, many of them being indeed suns, the centres of systems similar to what is termed our solar system. They are altogether so removed from us as to exert no appreciable influence upon the earth, and they may be dismissed from present consideration with the single observation, that they powerfully impress us with the vastness of the universe according to the scientific conception of it, far beyond realisation by the human imagination, and convince us that our earth cannot be the world that the theological theory asserts, but that it is really only a very minute portion of the vast creation.

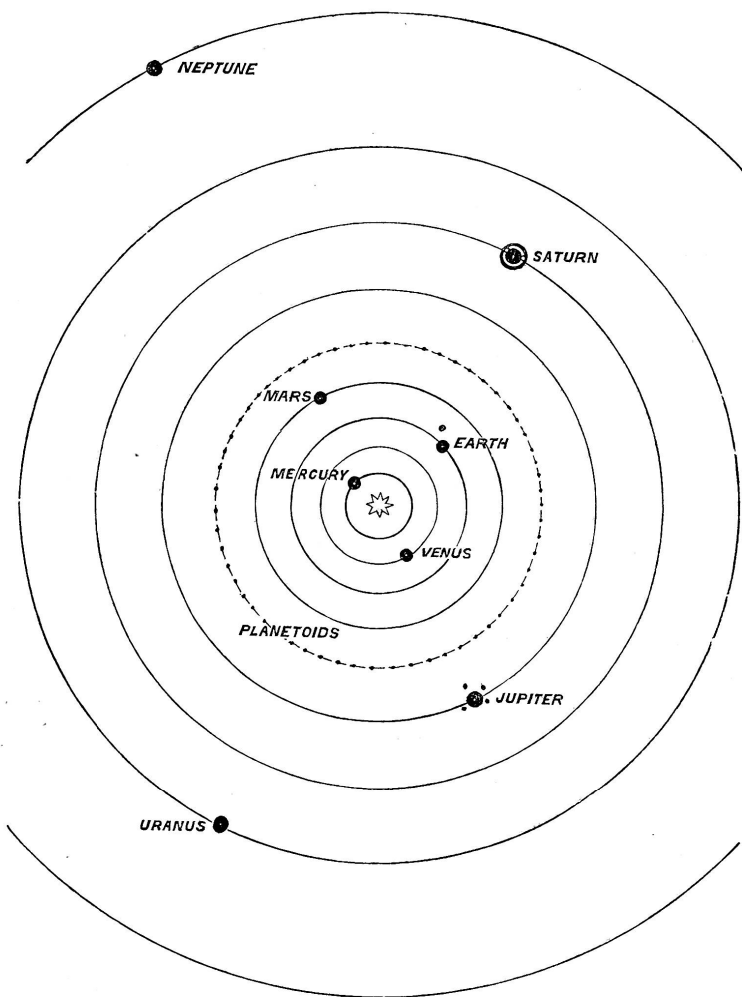
To attain anything like a realisable idea of our World according to Science we must limit our reflections to those few moving stars whose larger size and softer brilliancy seem so to fascinate our sight and thoughts, and which are, relatively to the fixed stars, very near to us. These moving stars then are the planets that circle round our Sun. The Earth is known by science to be one of such planets, and to an observer placed upon the surface of any of the others the earth would appear very much like what they appear to us, though indeed, as to some of them, the planet Jupiter for instance with its four satellites or moons and whose bulk is some 1300 times larger than that of the Earth, our planet with its one moon would appear to an inhabitant of Jupiter, if visible at all, as a very insignificant star indeed.

To comprehend this more clearly we must mentally separate this planetary system from the rest of the starry universe, and contemplate it distinctly by itself.

Here you have an ordinary representation of a few of the chief bodies of the system,* showing the Sun in the

* See diagram on opposite page.

OUR WORLD—ACCORDING TO SCIENCE.



centre and the several principle planets in their respective orbits round the Sun. It tolerably represents what the eye would see, supposing we were not upon the Earth, but looking down on the system from a great elevation on its north side.

Now, of this majestic system Science explains the probable formation. That is to say—It is known, from telescopic observations and mathematical calculations, that the moving bodies in this system are all similar in form, being globes not quite spherical or round but oblate, that is, flattened at their poles. That they all severally rotate upon their axes in the same direction. That they all move through space in the same common direction from West to East. That the curve of their respective orbits is not mathematically circular but elliptical. That the eccentricity of their orbits is very slight, and the inclination of their planes very small in comparison with that of the Solar Equator, and that all these planetary bodies revolve round the central Sun in particular periodic times.

Now these discovered facts, considered in connection with the known natural laws of gravitation, of motion, and of heat, and the known laws that rule the human intellect in its search after truth, impel our reason towards certain conclusions, viz.: That the former state of the solar atmosphere, myriads of ages ago, was that of a vast zone of nebulous or gaseous matter in a state of extreme heat, extending to the utmost limits of the system, undergoing a gradual process of progressive cooling, contraction, and condensation, and that the present state of the system is simply the necessary physical result of such natural process of cooling, contracting, and condensing; by virtue of which the nebulous mass broke up, or sepa-

rated into its several component moving bodies, at first liquid, then becoming solid and such as we now see them.

The entire system, which, as you have seen, is but a fragment of the starry cosmos, is yet of a size almost beyond the grasp of our understanding. Thus, the central Sun is a body 883,000 miles in diameter and is at a distance from our Earth of 93 millions of miles. The Sun's distance from the planet Jupiter is 496 millions of miles, and its distance from the planet Neptune is more than 2,800 millions of miles. These figures help to give us some idea of the immense magnitude of this relatively small system.

Now the points to which I wish to draw your attention are that science has further discovered that this system and every portion of it is governed by, as well as being the result of the operation of, fixed natural laws, especially the laws of gravitation, of motion, of light, and of heat. That these laws operate uniformly and continuously upon each one of the bodies of this system as a part of the whole, and that, with regard to some of these laws—the law of gravitation for example, it could not possibly be suspended or altered (physically speaking) in reference to any one of these bodies, without affecting the relation subsisting between it and all the other bodies of the system, so as to perturb, probably annihilate its cosmic harmony, as we have it mathematically demonstrated in the immortal "*Principia*" of Sir Isaac Newton.

You need not then be startled to hear that some of the greatest astronomers the world has seen, men who have made the laws of this stupendous system their profoundest study, notably the illustrious Laplace and Lalande, have declared that they had been unable to detect in the recondite mechanism of its invariable order any indication whatever of the God of theology.

The system, so far as human knowledge of it extends, may be described as a realm of Natural invariable law, Such as we see it now, it has existed through countless ages, and such it must continue to exist for countless ages to come !

Therefore, whilst theologians for the last 1800 years have been perpetually preaching the approaching end of the World, astronomers have only recently calculated the coming variations in the eccentricity of the Earth's orbit for a million years following the year 1800 !

Hence Science teaches us that the general laws of the astronomical phenomena of our solar system constitute the basis of all our real knowledge.

So a venerated philosopher has said—

“Two things I contemplate with ceaseles awe ;
The Stars of Heaven, and man's sense of Law.”

Turning now from the system, we must concentrate our attention upon a very small, but integral portion of it, a body scarcely 8000 miles in diameter, that globe which we call the Earth ; for obviously we can form no scientific theory of human existence without knowing the scientific elements that characterise the planet which is the home of that existence. The sciences then of Astronomy and Geology, which together give us the space scale and the time scale of our world, armed with the knowledge of the natural laws already referred to, have been able to trace the formation, the shape, and the history of the Earth for ages before man appeared upon it, and to tell us that plants and animals came into existence by slow degrees, and that the condition to which they had severally attained at the time of man's appearance was the result of variation or natural selection progressing by means of the physiological interaction of adapta-

tion, and inheritance and survival of the fittest operating throughout, not *six days*, but enormously long periods of time. In fact, as to the progress or change in everything taking place on our planet, including the seemingly capricious phenomena of human actions, and even, (as Dr. Maudesley put it to us so clearly last Sunday), the apparent freedom of the will, Science has discovered that all is regulated by the operation of invariable natural law, linked together, that is, in a chain of secondary causation, whose only modification is brought about by the intervention of human intelligence.

Thus Science is assured that the law of gravitation would annihilate in an instant the most pious person in the kingdom, if he lost his footing on a mountain without having first placed himself in circumstances to counteract the inexorable operation of such law, or, that if he innocently swallowed what the laws of physiology have shown to be a fatal dose of prussic acid, not all the prayers of Christendom could avail to save his life.

We are thus according to Science living under the reign of invariable natural law, and not according to Theology under the reign of arbitrary supernatural will, and therefore the aim of the human mind should be to find out and to study Natural Law, rather than to keep on seeking by perpetual entreaty to influence Supernatural Will.

These few facts, which for our present purpose may be accepted as sufficiently representing an outline of the theory of the Universe derived from Science, are no longer questioned by competent minds, and I should hardly think that anyone capable of giving them unprejudiced consideration could fail to perceive, that they are contradictory to, and incompatible with the theory derived from Superstition, which I commenced by describing.

Now, with reference to the first appearance or creation of man, Science can at present furnish us only with probabilities. These are however the logical outcome of an apparatus of evidence almost irresistible.

The scientific view of the origin of the human species is that which has been made more or less familiar to us by the works of our illustrious countryman Charles Darwin. The logic of his argument is really very clear, as well as cogent, and the result of it may, I think, be thus intelligibly stated. Due regard being had to what is now known geologically, zoologically, and embryologically of the ascending gradations of animal life, especially in the vertebrate series, and regard being also had to the known continuity of Nature, it is highly probable that man is the evolution or development of some lower animal form of the simian or ape species, from the individuals of which he is found to differ organically less than the higher and lower apes differ from each other.

Observe—Darwin does not say that Man came from a monkey. No one capable of comprehending his great argument would give utterance to such an absurdity; but, if Darwin's biological theory embodies the truth, then there must have been some ancestral link in the pedigree of man which has not yet been discovered.

Man, observes Darwin, must be included with other organic beings in any general conclusion respecting the manner of his appearance on this earth. And Professor Huxley, in his treatise on Man's place in Nature, has clearly shown from exhaustive observation of biological phenomena, that the mode of origin and the early stages of the development of man are identical with those of the animals below him in the scale.

But, be man's origin what it may, that with which we

are more immediately concerned is a scientifically established fact, viz., his unity of organization with the higher animals, which again are scientifically found to be organically co-ordinated with the entire series of life below them. So that it may be said all the organisms on our planet are related through their structural and functional resemblances—the human being similar to the animal organism, only higher in degree.

Such then is the conception of the origin and nature of Human Life derived from the discoveries of Science.

Now it is remarkable that with regard to the scientific theory of the Universe, and of the origin and nature of Man, there is an almost total absence of proselyting societies for diffusing knowledge of the theory and bringing about belief in it. There is no Sunday Science School Society. There is no gratuitous distribution of scientific tracts or texts.

Indeed, with the exception of the British Association for the Advancement of Science, and the Society under whose auspices I am now addressing you, I can scarcely call to mind a single Society whose main object it is to circulate the knowledge of scientific truth amongst the people at large, and not only so, but we may call to mind that on this day of the week at this very hour there are being delivered from thousands of pulpits exciting exhortations to persuade or to frighten men and women (chiefly I suspect the latter) still to go on, supinely acquiescing in the theological theory; whilst, with reference to our Society's Lectures delivered here, they have, on the part of the public press, been simply welcomed with the conspiracy of silence.

Yet I do not think the people, if encouraging opportunities were afforded them, would be found generally

indifferent to the acquisition of scientific truth, insensible to its sublimity, or regardless of its utility.

The Archbishop of York, in his sermon preached on the occasion of the meeting of the British Association in August last, declared that "he did not know how it would fare with them if none but scientific theories were to guide them, for" (said his Grace) "the great majority of men did not take an interest in scientific generalisations, they could not appreciate them." Well, I think it might fairly be replied to these observations that the majority of men are simply kept in ignorance of science, and have really at present no available means provided for their gaining scientific knowledge; but, if they had, I will venture to say most advisedly that they would soon be found to prefer Science to Superstition, quickly become able to distinguish the light of nature from the darkness of dogma, and eager to guide themselves by scientific authority.

The scientific theory, having then explained to us the probable origin, and the physiological nature of man, proceeds to enlighten us concerning the conditions under which he is found to increase and multiply.

Now the fundamental natural law discovered by science in relation to the multiplication of living organisms is simply this,—that they are everywhere, and under purely physical conditions, produced in excess of their means of subsistence. In other words, many more are born than can possibly survive. Hence the great struggle for existence, so graphically described, especially in relation to plants and animals, in Haeckel's "History of the Creation," and in Darwin's great works.

But this primordial natural law is proved to apply equally to the production of human beings, and our

interest at the present moment is the consideration of the effect of its operation and consequent struggle for existence on the human race.

If we carry our minds to the populations of the East we can have no difficulty in realising this problem. In Cornelius Walford's instructive book on "the Famines of the World," we read accounts of "Nature's terrible correctives of redundancy" in all their unmitigated horror. The recent famine in India has destroyed in one Presidency alone more than 500,000 people by starvation! and has thrown a million and a half more upon charity. It has indeed been recently stated on authority that 1,250,000 persons have perished of this famine. Such is the appalling result of the people recklessly multiplying beyond their means of subsistence.

We are blind however to the operation of the law of population amongst ourselves. We fail to see its working in the premature deaths of the forty per cent. of all that are born under five years of age, in the 42,000 deaths under twenty years of age out of the 83,000 annual deaths in this metropolis, so blinded are we to the warnings of Nature through our biassed belief in the theological theory. Yet the great majority of our untimely deaths are truly traceable to the very causes that in uncivilised countries terminate in actual starvation!

The first canon of scientific culture of life therefore requires that reckless or irrational multiplication should be restrained, and that man should apply his intelligence towards controlling the purely physical and mechanical conditions of reproduction.

We see this canon systematically carried out by the florist in his culture of flowers. Seeds are sown, but when they come up they are carefully thinned out, in

order that, there being no overcrowding, healthy and beautiful flowers may be produced by those that are left. We see the same principle in operation where fine fruit is desired. The buds are thinned out upon the trees, in order that the diminished number that are left may attain perfection of size and maturity. The agriculturist follows precisely the same course. He is careful, as regards his stock, that only a limited number of offspring shall be produced or allowed to survive, and, moreover, that their parentage shall be the result of careful selection.

Some idea may be gained of the value and importance of such selective breeding from a case recently decided in our Law Courts, in which a well known grazier recovered a sum of £750 damages for the injury inflicted on his herd by the fraudulent introduction of an animal with a false pedigree, but guaranteed, when he purchased it, to be thorough bred.

Can we doubt what might be the improvement of the human race, if even the slightest similar care were taken with our own marriages?

“Man’s natural qualities,” observes Francis Galton, in his masterly work on *Hereditary Genius*, “are derived by inheritance under exactly the same conditions as are the form and the physical features of the whole organic world.” “Man,” says Darwin, “scans with scrupulous care the character and pedigree of his horses, cattle, and dogs before he matches them, but when he comes to his own marriage, he rarely or never takes any such care. Yet he might by selection do something, not only for the bodily constitution and frame of his offspring, but for their intellectual and moral qualities.”

Now the continuity of structure and function, that has been traced by biological science to exist between

human, animal, and vegetal organisms, has enabled Science by comparative research, that is, by observation and experiment upon the lower animals, and even upon individuals of the vegetable kingdom, to acquire remarkably useful knowledge of the organic nature and constitution of the human being, and, through these means, to suggest most important rules for its treatment and progressive improvement.

This is no new idea even in this country. Sir Richard Steele, writing in the "Tatler" 150 years ago, told his readers that "one might wear any passion out of a family by culture, as skilful gardeners blot a colour out of a tulip that hurts its beauty."

Science in short shows us that the life of man, like that of all other living organisms on our planet, is governed by fixed natural laws, and that by the use of his understanding man can improve his life through the discovery of these laws, and by regulating his conduct in obedience to their dictates. That all his faculties are adapted to his existence in this world of Nature; that they do not inform him of any Super-natural world, thereby suggesting that prosperity and enjoyment on earth are the real moral ends to be desired, and that his noblest aspirations should be transmuted into good and useful actions for mankind, and not consumed in senseless supplications addressed to Supernatural Power.

Thus Science shows us that the discovery by man of the physiological laws will enable him to enjoy health and good spirits—of the intellectual laws to acquire knowledge and mental power—of the economic laws to gain wealth or competency—of the social and moral laws to practice virtue, to delight in duty, and to attain to happiness.

Therefore Science, which yearns to see mankind rejoicing in life and action, counsels us that one great object of education should be the study of these laws—to inculcate obedience to them, and to train our understandings so that we may conform our lives to their unalterable nature.

In illustration of these propositions I observe, for example, that Science has established beyond controversy that the qualities, whether good or bad, of the parent are transmitted to, or are inherited by the offspring, and that this result is as certainly true of the human being as it is of the lower animal. Hence we are taught what grave responsibility does in reality rest upon us in becoming the factors of posterity—in other words, in bringing children into the world, for we are thus shown that the future of human life will be what we make it. So true is what our late friend Professor Clifford told us, “that man has made himself,” to which therefore let us add, “man can make himself better.”

The theological theory indeed assumes a supernatural mystery in the matter. Its favourite text, “Be fruitful and multiply,” addressed, you remember, to Noah, when nearly all the inhabitants of the earth had been destroyed, is supposed to be applicable to the teeming millions of the crowded cities of this nineteenth century! and it is correspondingly asserted by the theological theory that “when God sends mouths he sends meat to fill them.” But Science reads us a very different lesson, and I will quote, as pointedly expressing its salutary teaching, what Professor Matthew Arnold, in his remarkable book “Culture and Anarchy,” has said upon that subject.

“A man’s children” (he declares) “are not sent any more than the pictures upon his walls or the horses in

his stable are sent, and to bring people into the world when one cannot afford to keep them and oneself decently or to bring more of them into the world than one can afford so to keep is by no means an accomplishment of the divine will, or a fulfilment of Nature's simplest laws, but is just as wrong, just as contrary to the will of God, as for a man to have horses, or carriages, or pictures when he cannot afford them, or to have more of them than he can afford."

This extract from Matthew Arnold's writings, you may think is very plain speaking, but, as J. Stuart Mill has remarked, no one would guess from ordinary talk, that man had any voice or choice in the matter, so complete is the confusion of ideas on the whole subject, owing to the mystery in which it is shrouded by a spurious delicacy, and that the diseases of society can no more than corporal maladies be prevented or cured without being spoken about in plain language.

Now I think we may observe amongst our men of science, especially those whose minds are most free from the taint of that inherited mental malady Superstition, a growing tendency towards advocating the application to the culture of the Human Being of those scientific methods that have proved so successful in producing the exquisite growth, maturity, and beauty of cultivated Flowers and Fruit, and the joyousness, hilarity, and perfection of form, temper, and disposition of the thorough-bred Animal.

Such methods can of course only be applied to man by way of analogy—that is to say, in reference for instance to overpopulation, human beings cannot, like flowers, be destroyed after they are once born, nor can they be treated by mechanical methods as the lower animals are,

but man's intelligence can be appealed to in his own behalf, his reason can be aroused, and his moral sentiments interested, and the mode by which the reckless increase of his numbers should be diminished will undoubtedly be by inducing fewer births, so as to put a stop to premature deaths, and the diseases by which premature deaths are ushered in, diseases, which should plainly instruct us that, somehow the laws of Nature are being outraged.

Now, if this were to any appreciable extent accomplished it can hardly be doubted that a vast amount of human misery, that, viz., which is scientifically attributable to overpopulation, might be gradually eliminated. Even war could eventually be deprived of its victims, and the hideous vice that haunts the public places of our cities, so reproachful to our boasted civilization and the moral spirit of our age, might to a great extent be got rid of; so too the large amount of crime that results from temptation, so sorely pressing upon the indigent, made indigent by the competition of the overwhelming numbers that throng the labour market and depress the rate of wages, would almost disappear; the savagery of personal assaults especially upon wives, so often traceable to the irritability arising from overcrowding, and the demoralising effect of its vitiated atmosphere, would be found to vanish; and thus in fine our low-toned morality, which is the despair of the theologian, would in many respects be purified and elevated, the course of our existence tend to become converted into a career of virtuous enjoyment, and earthly Life, whose inborn delight is at present so embittered to all of us by its blendings, or surroundings of suffering, sorrow, and sin, might, not merely in theory, but really, and practically be made worth Living.

