
Marx
Machiavelli
Chesterton
Emerson
Joyce
Abbott
Hardy
Montaigne
Cooper
Austen
Defoe
Melville
Haggard
Hugo
Carroll
Christie
Eliot
Grimmer
Stoker
Molière
Wilde
Maupassant
Byron
Einstein
Fitzgerald
Engels
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Garnett
Hawthorne
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Kafka
Goethe
Dostoyevsky
Cotton
Hall
Baum
Kipling
Doyle
Willis
Henry
Leslie
Dumas
Nietzsche
Flaubert
Turgenev
Balzac
Stockton
Vatsyayana
Crane
Burroughs
Verne
Curtis
Tocqueville
Whitman
Gogol
Vinci
Homer
Widger
Tolstoy
Busch
Darwin
Thoreau
Potter
Freud
Zola
Twain
Scott
Lawrence
Plato
Kant
Jowett
Stevenson
Dickens
Harte
Andersen
Burton
Hesse
London
Descartes
Cervantes
Poe
Aristotle
Wells
Voltaire
Hale
James
Hastings
Cooke
Bunner
Shakespeare
Irving
Richter
Chambers
Chekhov
da
Doré
Swift
Dante
Shaw
Benedict
Alcott
Wodehouse
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The Relations Between Religion and Science Eight Lectures Preached Before the University of Oxford in the Year 1884

Frederick Temple

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EXTRACT

THE LAST WILL AND TESTAMENT

OF THE LATE

REV. JOHN BAMPTON,

CANON OF SALISBURY.

—"I give and bequeath my Lands and Estates to the Chancellor, Masters, and Scholars of the University of Oxford for ever, to have and to hold all and singular the said Lands or Estates upon trust, and to the intents and purposes hereinafter mentioned; that is to say, I will and appoint that the Vice-Chancellor of the University of Oxford for the time being shall take and receive all the rents, issues, and profits thereof, and (after all taxes, reparations, and necessary deductions made) that he pay all the remainder to the endowment of eight Divinity Lecture Sermons, to be established for ever in the said University, and to be performed in the manner following:

"I direct and appoint, that, upon the first Tuesday in Easter Term, a Lecturer be yearly chosen by the Heads of Colleges only, and by no others, in the room adjoining to the Printing-House, between the hours of ten in the morning and two in the afternoon, to preach eight Divinity Lecture Sermons, the year following, at St. Mary's in Oxford, between the commencement of the last month in Lent Term, and the end of the third week in Act Term.

"Also I direct and appoint, that the eight Divinity Lecture Sermons shall be preached upon either of the following Subjects—to confirm and establish the Christian Faith, and to confute all heretics and schismatics—upon the divine authority of the holy Scriptures—upon the authority of the writings of the primitive Fathers, as to the faith and practice of the primitive Church—upon the Divinity of our Lord and Saviour Jesus Christ—upon the Divinity of the Holy Ghost—upon the Articles of the Christian Faith, as comprehended in the Apostles' and Nicene Creeds.

"Also I direct, that thirty copies of the eight Divinity Lecture Sermons shall be always printed, within two months after they are preached; and one copy shall be given to the Chancellor of the University, and one copy to the Head of every College, and one copy to the Mayor of the city of Oxford, and one copy to be put into the Bodleian Library; and the expenses of printing them shall be paid out of the revenue of the Land or Estates given for establishing the Divinity Lecture Sermons; and the preacher shall not be paid, nor be entitled to the revenue, before they are printed.

"Also I direct and appoint, that no person shall be qualified to preach the Divinity Lecture Sermons, unless he hath taken the degree of Master of Arts at least, in one of the two Universities of Oxford or Cambridge; and that the same person shall never preach the Divinity Lecture Sermons twice."

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LECTURE III.

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LECTURE VIII.

THE CONCLUSION OF THE ARGUMENT.

1 Corinthians xii. 3.

No man can say that Jesus is the Lord, but by the Holy Ghost.

Uniformity of nature not demonstrated, but established, except in two cases; the interference of human will and of Divine Will. The exception no bar to the progress of Science. Unity to be found not in the physical world, but in the physical and moral combined. The Moral Law rests on itself. Our recognition of it on our own character and choice. But we expect it to show its marks in the physical world: and these are the purpose visible in Creation, the effects produced by Revelation. Nevertheless a demand for more physical evidence; but the physical cannot be allowed to overshadow the spiritual. Dangers to believers from leaning this way: superstition; blindness; stagnation. The guarantee for spiritual perceptiveness: to take Jesus as the Lord of the conscience, the heart, the will.

LECTURE I.

THE ORIGIN AND NATURE OF SCIENTIFIC BELIEF.

The subject introduced: Scientific belief. Mathematics and Metaphysics excluded. The Postulate of Science: the Uniformity of Nature. Hume's account of it. Kant's account of it. Insufficiency of both accounts. Science traced back to observation of the Human Will. The development of Science from this origin. The increasing generality of the Postulate: which nevertheless can never attain to universality.

LECTURE I.

THE ORIGIN AND NATURE OF SCIENTIFIC BELIEF.

'O Lord, how manifold are Thy works: in wisdom hast Thou made them all; the earth is full of Thy riches.' —*Psalm* civ. 24.

Those who believe that the creation and government of the world are the work of a Being Whom it is their duty to love with all their hearts, Who loves them with a love beyond all other love, to Whom they look for guidance now and unending happiness hereafter, have a double motive for studying the forms and operations of Nature; because over and above whatever they may gain of the purest and highest pleasure in the study, and whatever men may gain of material comfort in a thousand forms from the results of the study, they cannot but have always present to their minds the thought, that all these things are revelations of His character, and to know them is in a very real measure to know Him. The believer in God, if he have the faculty and the opportunity, cannot find a more proper employment of time and labour and thought than the study of the ways in which God works and the things which God has made. Among religious men we ought to expect to find the most patient, the most truth-seeking, the most courageous of men of science.

We know that it is not always so; and that on the contrary Science and Religion seem very often to be the most determined foes to each other that can be found. The scientific man often asserts that he cannot find God in Science; and the religious man often asserts that he cannot find Science in God. Each often believes himself to be in possession, if not of the whole truth, at any rate of all the truth that it is most important to possess. Science seems to despise religion; and religion to fear and condemn Science. Religion, which certainly ought to put truth at the highest, is charged with refusing to acknowledge truth that has been proved. And Science, which certainly ought to insist on demonstrating every assertion which it makes, is charged with giving the rein to the imagination and treating the merest speculations as well-established facts.

To propose to reconcile these opposites would be a task which hardly any sane man would undertake. It would imply a claim to be

able to rise at once above both, and see the truth which included all that both could teach. But it is a very useful undertaking, and not beyond the reach of thoughtful inquiry by an ordinary man, to examine the relations between the two, and thus to help not a few to find a way for themselves out of the perplexity. And this inquiry may well begin by asking what is the origin and nature of scientific belief on the one hand and of religious belief on the other. In this Lecture I propose to deal with the former.

It is not necessary to include in the Science of which I am to speak either Mathematics or Metaphysics. In as far as I need touch on what belongs to either, it will be only for the purpose of answering objections or of excluding what is irrelevant. And the consequent restriction of our consideration to the Science which concerns itself with Nature greatly simplifies the task that I have undertaken. For it will be at once admitted in the present day by all but a very few that the source of all scientific knowledge of this kind is to be found in the observations of the senses, including under that word both the bodily senses which tell us all we know of things external, and that internal sense by which we know all or nearly all that takes place within the mind itself. And so also will it be admitted that the Supreme Postulate, without which scientific knowledge is impossible, is the Uniformity of Nature.

Science lays claim to no revelations. No voice of authority declares what substances there are in the world, what are the properties of those substances, what are the effects and operations of those properties. No traditions handed down from past ages can do anything more than transmit to us observations made in those times, which, so far as we can trust them, we may add to the observations made in our own times. The materials in short which Science has to handle are obtained by experience.

But on the other hand Science can deal with these materials only on the condition that they are reducible to invariable laws. If any observation made by the senses is not capable of being brought under the laws which are found to govern all other observations, it is not yet brought under the dominion of Science. It is not yet explained, nor understood. As far as Science is concerned, it may be called as yet non-existent. It is for this very reason possible that the

examination of it may be of the very greatest importance. To explain what has hitherto received no explanation constitutes the very essence of scientific progress. The observation may be imperfect, and may at once become explicable as soon as it is made complete; or, what is of far more value, it may be an instance of the operation of a new law not previously known, modifying and perhaps absorbing the law up to that time accepted. When it was first noticed in Galileo's time that water would not ascend in the suction pipe of a pump to a greater height than 32 feet, the old law that nature abhors a vacuum was modified, and the reasons why and the conditions under which Nature abhors a vacuum were discovered. The suction of fluids was brought under the general law of mechanical pressure. The doctrine that Nature abhorred a vacuum had been a fair generalization and expression of the facts of this kind that up to that time had been observed. A new fact was observed which would not fall under the rule. The examination of this fact led to the old rule being superseded; and Science advanced a great step at once. So in our own day was the planet Neptune discovered by the observation of certain facts which could not be squared with the facts previously observed unless the Law of Gravitation was to be corrected. The result in this case was not the discovery of a new Law but of a new Planet; and consequently a great confirmation of the old Law. But in each case and in every similar case the investigation of the newly observed fact proceeds on the assumption that Nature will be found uniform, and on no other assumption can Science proceed at all.

Now it is this assumption which must be first examined. What is its source? What is its justification? What, if any, are its limits?

It is not an assumption that belongs to Science only. It is in some form or other at the bottom of all our daily life. We eat our food on the assumption that it will nourish us to-day as it nourished us yesterday. We deal with our neighbours in the belief that we may safely trust those now whom we have trusted and safely trusted heretofore. We never take a journey without assuming that wood and iron will hold a carriage together, that wheels will roll upon axles, that steam will expand and drive the piston of an engine, that porters and stokers and engine-drivers will do their accustomed duties. Our crops are sown in the belief that the earth will work its usual chemistry, that heat and light and rain will come in their turn and have

their usual effects, and the harvest will be ready for our gathering in the autumn. Look on while a man is tried for his life before a jury. Every tittle of the evidence is valued both by the judge and jury according to its agreement or disagreement with what we believe to be the laws of Nature, and if a witness asserts that something happened which, as far as we know, never happened at any other time since the world began, we set his evidence aside as incredible. And the prisoner is condemned if the facts before us, interpreted on the assumption that the ordinary laws of Nature have held their course, appear to prove his guilt.

What right have we to make such an assumption as this?

The question was first clearly put by Hume, and was handled by him with singular lucidity; but his answer, though very near the truth, was not so expressed as to set the question at rest.

The main relation in which the uniformity of Nature is observed is that of cause and effect. Hume examines this and maintains that there is absolutely nothing contained in it but the notion of invariable sequence. Two phenomena are invariably found connected together; the prior is spoken of as the cause, the posterior as the effect. But there is absolutely nothing in the former to define its relation to the latter, except that when the former is observed the latter, as far as we know, invariably follows. A ball hits another ball of equal size, both being free to move. There is nothing by which prior to experience we can determine what will happen next. It is just as conceivable that the moving ball should come back or should come to rest, as that the ball hitherto at rest should begin to move. A magnet fastened to a piece of wood is floating on water. Another magnet held in the hand is brought very near one of its poles or ends. If two north poles are thus brought together the floating magnet is repelled; if a north and a south pole are brought together the floating magnet is attracted. The motion of the floating magnet is in each case called the effect; the approach of the magnet held in the hand is called the cause. And this cause is, as far as we know, invariably followed by this effect. But to say that one is cause and the other effect is merely to say that one is always followed by the other; and no other meaning, according to Hume, can be attached to the words cause and effect.

Having established this interpretation of these words, Hume goes on to ask: What can be the ground in reason for the principle universally adopted, that the law of cause and effect rules phenomena, and that a cause which has been followed by an effect once will be followed by the same effect always? And he concludes that no rational ground can be found at all, that it is the mere result of custom without anything rational behind it. We are accustomed to see it so, and what we have been so perpetually accustomed to see we believe that we shall continue to see. But why what has always been hitherto should always be hereafter, no reason whatever can be given. The logical conclusion obviously is to discredit all human faculties and to land us in universal scepticism.

It was at this point that Kant took up the question, avowedly in consequence of Hume's reasoning. He considered that Hume had been misled by turning his attention to Physics, and that his own good sense would have saved him from his conclusion had he thought rather of Mathematics. Kant's solution of the problem, based mainly on the reality of Mathematics, and especially of Geometry, is the direct opposite of Hume's.

It will be most easy to give a clear account of Kant's solution by using a very familiar illustration. There is a well-known common toy called a Kaleidoscope, in which bits of coloured glass placed at one end are seen through a small round hole at the other. The bits of glass are not arranged in any order whatever, and by shaking the instrument may be rearranged again and again indefinitely and still without any order whatever. But however they may be arranged in themselves they always form, as seen from the other end, a symmetrical pattern. The pattern indeed varies with every shake of the instrument and consequent re-arrangement of the bits of glass, but it is invariably symmetrical. Now the symmetry in this case is not in the bits of glass; the colours are there no doubt, but the symmetrical arrangement of them is not. The symmetry is entirely due to the instrument. And if a competent enquirer looks into the instrument and examines its construction, he will be able to lay down with absolute certainty the laws of that symmetry which every pattern as seen through the instrument must obey.

Just such an instrument, according to Kant, is the human mind. Space and Time and the Perceptive Faculties are the parts of the instrument. Everything that reaches the senses must submit to the laws of Space and Time, that is, to the Laws of Mathematics, because Space and Time are forms of the mind itself, and, like the kaleidoscope, arrange all things on their way to the senses according to a pattern of their own. This pattern is as it were super-added to the manifestations that come from the things themselves; and if there be any manifestations of such a nature that they could not submit to this addition, or, in other words, could not submit to Mathematical Laws, these manifestations could not affect our senses at all. So too our Understanding has a pattern of its own which it imposes on all things that reach its power of perception. What cannot be accommodated to this pattern cannot be understood at all. Whatever things may be in themselves, their manifestations are not within the range of our intelligence, except by passing through the arranging process which our own mind executes upon them.

It is clear that this wonderfully ingenious speculation rests its claims for acceptance purely on the assertion that it and it alone explains the facts. It cannot be proved from any principle of reason. It assumes that there is a demonstrative science of Mathematics quite independent of experience, and that there are necessary principles of Physics equally independent of experience. And it accounts for the existence of these.

With Mathematics we are not now concerned, and I will pass them by with only one remark. The ground on which Kant's theory stands is not sufficient, for this simple reason. It accounts for one fact; it does not account for another fact. It accounts for the fact that we attach and cannot help attaching a conviction of necessity to all mathematical reasoning. We not only know that two straight lines cannot enclose a space, but we know that this is so and must be so in all places and at all times, and we know it without any proof whatever. This fact Kant accounts for. Space is according to him a part of our kaleidoscope; you can always look into it and see for yourself what are the laws of it. But there is another fact. This space of which we are speaking is unquestionably to our minds not a thing inside of us but outside of us. We are in it. We cannot get rid of a sense that it is independent of ourselves. We can imagine our-