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A table of contents for *Journal of the Transactions of the Victoria Institute* can be found here:

https://biblicalstudies.org.uk/articles_jtvi-01.php

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1923.

652ND ORDINARY GENERAL MEETING.

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W., ON MONDAY, MARCH 26TH, 1923,
AT 4.30 P.M.

The Rev. CHARLES GARDNER, B.A., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed and signed, and the Honorary Secretary announced the election of the following: As a Member, Walter H. Frizell, Esq., M.A., J.P., and as Associates, the Rev. George Denyer and Miss Emma Moore Blackwood.

In the enforced absence of the Lecturer, the Rev. J. J. B. Coles, M.A., the CHAIRMAN read his paper on "Relativity and Christian Philosophy."

The author and several of those who took part in the discussion having expressed the difficulty they felt in discussing this very technical subject in a way that would be helpful to those who had not previously studied it, and in view of the heavy printing expenses, the Council decided that the following abridgment is the most useful form in which to publish the paper.

RELATIVITY AND CHRISTIAN PHILOSOPHY.

By the Rev. J. J. B. COLES, M.A.

UNLESS we study the *philosophy* of history as well as its written annals and chronicles, our knowledge of God, Man and the Universe will be incomplete and defective, and our attempt at a synthesis of Philosophy, Science, Art and Religion will not be crowned with success.

The recent Gifford Lectures by Lord Balfour, which so ably maintain Theistic Foundations of Belief, may serve the purpose of an introduction to this paper on "Relativity and Christian Philosophy."

THE GIFFORD LECTURES.

At the outset of his final lecture, Lord Balfour said that they had been discussing three great values, all vital to the highest life of mankind. These might be described as ethical values, which he preferred to describe as Love; æsthetic values, or Beauty; and cognitive values, or Truth. Their main theme had been the third, namely, Belief and Truth. He had always said that they could not maintain those values in the world permanently at their highest level if they banished from that

world the idea of design, of creation, of a God who was Himself the author and the sustainer of these high values. Summarizing the points of his second course, Lord Balfour said that, however imperfect had been his survey of the boundless sea, and however incompetent he had been to plumb its depths, he thought he had gone far enough to show that the most certain of all facts was that there was yet no agreement among competent observers which enabled them to say that in this unintelligible world there was at least one thing which they all understood, that was the nature, the character, and the limits of our own being. If they assumed the naturalistic view of the universe, that all rational results were produced by a non-rational cause, he did not think they would deny they had got themselves into a system in which the premises and the conclusions and the causes and the effects absolutely refused to coalesce and harmonize. How was it that the blind collision of molecules, atoms, and sub-atoms in the remote past had issued as a mere question of cause and effect in the production of knowledge of science and of things of which we justly boasted? How from such beginnings could they expect such conclusions? Those who took the naturalistic view of knowledge must explain how unreason had produced reason. They must try to tell us, he added, amid applause, how this purposeless clash of atoms had, as one of its accidental by-products, turned out beings so constituted that they could look back and discuss the utter insufficiency and inefficiency of their own pedigree. They must bring in at the beginning of the process, transfusing it from beginning to end, some form of reason, some element of purpose, design—to use an old-fashioned and perhaps unjustly discredited word—in some shape or other.

Theism must be an indubitable portion of any system which claimed to get out of the blind causation of rational results. Not to mince matters, if they wanted to see the world in which we all believed and to hold the creed which we all accepted in its most rational form, they must assume guidance and inspiration from the beginning.

If they held, as he held, that life was the result of the gradual divine influence upon the course of human thought they would look forward to truth being more and more clearly brought to light and they would feel convinced that there was nothing to fear from science, but that their great interest, so far as this world was concerned, was to press on science by every means in

their power. The beliefs which they all held, which were the bonds uniting them and made the foundation of society possible, could only be considered as a rational system if it were treated in a theistic setting.

Note.—The philosophy of the learned lecturer, though very valuable as showing the inadequacy of modern philosophy, science and religion to solve the great questions of to-day, is nevertheless unsatisfying and incomplete. The “Foundations of Belief” are without the true key for that reconstruction which Modern Thought requires.

QUOTATIONS FROM RECENT WRITERS ON SCIENCE.

“*Magna est veritas et praevalabit.* Science is ever young and plastic, ever ready to receive new ideas, in spite of the fact that such acceptance means the utter demolition and destruction of the fair fabric of former hypotheses which seemed built to withstand centuries—a very palace of truth. The marvellously perfected instruments in use to-day, the knowledge that all matter, the whole universe, is electrical in origin and manifestation—all are giving a new viewpoint and a fresh answer to the Riddle of the Universe.”

THE LARGEST TELESCOPE.

“On Mount Wilson in Southern California has been erected the largest telescope yet made, which has the power of magnifying the brightness of a star 250,000 times, and brings the moon, which is 240,000 miles away, within a few hundred miles of the earth. Many new stars have come within its radius, and, it is hoped, by following the course of so-called ‘runaway’ stars, and noting their coming and going, to really find a limit to the bounds of the Universe. It takes eight minutes for light from the sun, travelling at 186,000 miles a second, to reach this earth, four years from the nearest star, and many hundreds of years from some of the very distant ones. The distances are so enormous that astronomers find it only possible to estimate distance by ‘light.’

“Another hypothesis of science is tottering to its fall. Scientists may have differed as to the nature of ether, some maintaining that it was tenuous, others that it was solid and the matter it pervaded was tenuous; but no one doubted its existence as the medium through which the light and other electrical waves

reached the earth. Now Dr. Charles F. Steinmetz, an eminent American physicist, has promulgated the theory that there is no ether, after all, but merely a field of electrical force. There is no necessity for a medium for carrying the electrical waves, as they can travel without it. Electrical energy is the force, the motive power, the very Universe itself. The electron is not merely the unit of electricity but the smallest particle of matter."

"The discovery of radium by Madame Curie has revolutionized all our ideas concerning the indestructibility of matter."

"Sensation and reality are two different things. What we see is not the reality but the phenomenon, or appearance. The invisible and immaterial are more real than the visible and material. Time is merely the way in which we express our consciousness of change." ["Daily Mail" Year Book.]

RELATIVITY.

Matter, Space and Time according to the relativist are types of relation between events.

The idea of the derivative character of matter, space and time belongs to the modern principle of relativity.

The principle of relativity is a deduction from facts of observation.

The relativist says that space, time and matter are different ideas for different observers.

The Newtonian law of gravitation demanded something other than matter, space and time—namely gravitation. It presumed a force which modified the movements of matter.

Relativity gives the death-blow to whatever might remain of the old form of materialism.

What has hitherto been called a law of nature becomes a law of our particular aspect of nature—which is only one of an infinite number of aspects.

Relativity demands a review of existing laws.

The new point of view is of especial interest because it suggests the possibility of a more complete unification of Nature than any previously imagined.

Newton thought in terms of absolute space, time and matter.

Mercury has been under observation for many years—it is found that the position of the perihelion does change, but not by quite the same amount as expected.

No explanation was forthcoming until the advent of the theory of Relativity.

Recently, Scientists have had reason to question whether space, time and matter are really the absolute and fundamental things we have supposed.

Relativity declares that the conceptions of space and time also are not absolute and independent, but are relative to the observer.

Prof. Carr, of the London University, speaking on the "Relativity" theory, affirmed that "the religious importance of the Einstein Theory is enormous. It is going to produce a revolution in religious thought. It draws us away from the idea of a separate and transcendent God, and interprets and throws light on the idea of an immanent God.

"In fact, I should go so far as to say that Relativity can only be interpreted in terms of an Immanent God, a Reality which in its very nature is Life and consciousness."

(Christian philosophy teaches that God is both transcendent and immanent.)

The new doctrine of Relativity entails a complete uprooting of the conceptions that have formerly been held to lie inviolable at the foundations of thought and experience.

The theory is not merely a metaphysical speculation. It has arisen in order to explain certain facts of observation which seem to point to it as the most probable statement of the nature of the Universe which we perceive.

Matter, space and time are the three independent immovable foundation stones of the World as we are accustomed to regard it, and Science has hitherto adopted them as the only possible data in terms of which to express its discoveries.

For instance, the law of gravitation expresses the way in which matter will move near other matter, *i.e.* it describes how the position of *matter* in *space* changes as *time* advances.

"One of the most extraordinary hypotheses which Science has advanced is that of the presumed existence of ether and its permeation and pervasion of all matter and all space. No one has seen it. No one can define it. Sir Oliver Lodge says that it may be millions of times denser than iron, that matter itself is tenuous and mistlike in comparison with it. Others regard it as an inert gas, some as fibrous, others grainlike. Ether is the vehicle by which the light from the sun and stars reaches us. Light, sound, heat are conveyed by waves of varying length to our senses.

Light waves are so minute that millions of them would not cover a yard, yet X-rays are smaller still, being hardly one ten-thousandth their size. Heat waves are much larger. Wireless waves are huge, some of them measuring 5000 yards in length. In spite of these variations, however, they all have one attribute in common—they are all electrical disturbances travelling with the same velocity of 186,000 miles per second.

“There have been certain definite epochs in science—milestones on the path of progress. One was the discovery of the law of gravitation by Sir Isaac Newton in the seventeenth century—the law which keeps the sun, the moon, the earth in their courses, and controls the tiny atom, itself the centre of a solar system, with its whirling electrons. To-day, Professor Einstein, a Swiss Jew, occupying the Chair of Physics at the University of Berlin, has gone a step beyond Newton, and proved that light itself is composed of particles of matter and hence has to obey the same law of gravitation. This he has definitely proved by the result of the British Solar Eclipse Expedition of May 29th, 1919. The moon, travelling round the earth, at some time comes between it and the sun. Astronomers calculated the exact date at which such an eclipse would take place, and made arrangements to have photographs taken of the heavens during the period of its duration, and also photographs when the sun was absent. Einstein maintained that the light from a certain star was deflected by the attraction of the sun. He proved his point, for, when the photographs were compared, and elaborate calculations and measurements taken at Greenwich Observatory, it was found, without a shadow of doubt, that this deflection had taken place and to the almost exact degree which he had prophesied.

“‘Relativity,’ that word much in the public eye, is another discovery of Einstein. All time is relative. For instance, a day with us is not of the same duration as that of Mercury or Neptune. The former is only a fourth of ours, Neptune 164 times as long. Therefore, unless there is a fixed point in space to which we can refer everything, time can be only relative. Both Professor Larmor, in this country, and Professor Lorentz, of Holland, have come to the conclusion that matter is contracted in the direction of its motion through the ether current, bodies being actually shortened in the direction of their motion. As you change your position, everything changes and contracts to correspond, so there is no basis for comparison. Einstein’s thesis is that all we

can discuss is the relative motion of one body with another. Time is really the Fourth Dimension and must be measured as is length, height, and breadth. Objects moving in space build up different time intervals—thus time and space are interlinked.

“Science encroaches more and more upon the domain of philosophy. The study of the mind, once regarded as purely a function of philosophy, has now become a science and enters largely into schemes of education for the young and in the healing of the sick. Veritably, however, ‘a little knowledge is a dangerous thing’ in psychology, and incalculable damage may be done by the untrained practitioner. What is regarded as truth one day is superseded by fuller knowledge the next, but the victims of the experiments fall by the wayside. When we know that actual physical changes can be brought about by the state of the unconscious mind, it behoves us to move warily and to know what we are doing when we dredge its contents. On the other hand, real good has been done in cases of nervous breakdown and paralysis by letting the bottled-up emotions have free vent. Unconscious inhibitions often bring about a general weakening of mind and body.

“All science, all philosophy, all knowledge, is blending into one harmonious whole—a glorious unity pervades the cosmos. Natural law prevails everywhere from the lowest to the highest. There is only a difference in degree. ‘Life sleeps in the mineral, dreams in the vegetable and wakes in man.’” [“Daily Mail” Year Book.]

SOME OF THE DEEPER PROBLEMS OF RELATIVITY.

The Co-ordinate Geometry of Descartes brings one to problems of location in space not regarded from Euclid’s point of view as finite or *bounded* by straight or curved lines or surfaces.

It was Euclid’s great limitation that he confined his attention to “bits of space.”

Descartes first investigated the mathematics or the geometry of unlimited space—unbounded space—the space of Galileo and the physicists.

Hence sprang the science, not of Euclidian geometry, but of “co-ordinate geometry”—the science of *position* rather than of shape, as with Euclid.

Since Descartes’ time all mathematicians and physicists have been investigating the new geometry—the calculation of the

relations in "unbounded space" between points either at rest or *in motion*.

Out of these preliminary studies of "relativity" have grown Einstein's and other thinkers' theories as to the *nature* of space which has henceforward to be spoken of as a "space-time continuum."

Side by side with co-ordinate geometry have sprung up the "mathematics of the infinitesimal" and the "infinitesimal calculus."

According to Einstein, space may not be uniform everywhere.

In the Newtonian conception of space, bodies moved uniformly except when affected by the gravitational attraction of other bodies. A comet, for instance, moves at a uniform rate or velocity, but its velocity is accelerated on approaching the sun. Einstein's Theory is that it is not the pull of gravity that we must look to as accounting for the curved appearance of the line of the comet, but rather to the fact that space is different at different distances from the sun" (that is, what is *intrinsic* is the comet's pathway, not gravity). In other words, "space has properties contingent upon the nearness of the sun."

Space may have a variable density, just as if we had concentric globes or spheres of glass, the innermost sphere (nearest the sun) being the densest and the others gradually becoming less dense—till the outermost was as thin as air itself.

A ray of light passing through these layers of increasing density would be deflected—the pathway would be a curve—so the comet's pathway would be a curve.

This is the Einstein conception of space as opposed to the old notion of Galileo and Newton—in which lines were straight unless acted upon by gravity.

The conception of geodesic motion is the vital one—*i.e.* the shortest track—a conception arising out of measurements on the *surface of a sphere*.

CURVED SPACE AND CURVED TIME.

The theory of Relativity profoundly modifies our basic conception of the universe.

"Line in nature is not found ;
Unit and universe are round."

SOME LEADING TRUTHS IN CHRISTIAN PHILOSOPHY.

Christ is the centre of all God's ways.

By Him all things were created, whether visible or invisible.
In Him dwelleth all the fulness of the Godhead in bodily form.

By Him all things consist—and are upheld.

To Him every knee shall bow.

God's purpose is that the whole universe in its most comprehensive sense shall be under His government.

By His Cross—His Atonement—every question has been settled.

God is the Founder, Christ and His finished work of redemption is the *foundation* of Christian philosophy.

The expression the "Founder of Christianity" as applied to Christ is unscriptural and often misleading, especially when used by "Back-to-the-Gospels" advocates.

Christian philosophy teaches that Genesis i and ii are not to be merged into one account of creation—for God has created by the more gradual process of evolution as briefly summed up in Genesis i and also by special and direct action as related in Genesis ii. There is no contradiction whatever in the two chapters.

The "Creative Evolution" of Henri Bergson is only half a truth—and like many half-truths may be used to obscure deeper truth. *Élan vital*—or "urge" belongs to life as a living force—an inherent attribute, created by God.

Both deductive and inductive processes of reasoning must be used by a Christian philosopher.

Prof. J. G. Frazer's works are vitiated by the fallacy of "husteron proteron."

Myths and mythology and the legends of antiquity were perversions of patriarchal faith—by those—*e.g.* the Egyptians and Babylonians and others, who changed the truth of God into a lie—changed the glory of the incorruptible God to an image like to corruptible man and four-footed beasts and creeping things—as demonstrated by Egyptian and Assyrian remains. "Professing themselves to be wise they became foolish."

They lost the truth of God—the sense of His Divinity *θειότης* as well of His Deity *θεότης*, and the utter degradation of Paganism followed.

The inductive process of reasoning in vogue since the time of Bacon is often unfruitful, for the Revelation of God supplies a true knowledge as to the question of Origins.

Inductive reasoning, when the truth of Revelation is set aside—is foolishness, and leads to no true synthesis of Philosophy, Science, Art and Religion.

A man who sees nothing beyond the evolutionary theories of modern philosophies can, as it were, make use of one hemisphere only of his brain, the other hemisphere is atrophied.

A philosopher who rejects an inspired revelation in the matter of Origins can never solve the problems which all true thinkers have before them.

CONCLUDING REMARKS.

Christian philosophy holds the keys for a true unification of knowledge—a synthesis of Philosophy, Science, Art and Religion—and it is the great privilege of the members of the Victoria Institute to point to the living oracles of God, the sacred Scriptures, as the only true source from which to answer the all-important question of olden time, “Where shall wisdom be found and where is the place of Understanding?”

DISCUSSION.

The CHAIRMAN (the Rev. CHARLES GARDNER) said that Mr. Coles' paper was full of good points but they were not co-ordinated into a luminous whole. He agreed with many of the points, but would criticize some. For example, he did not think it true to say that God was the Founder of Christian philosophy. Christianity needed a philosophy. It was gradually formulated in the course of the centuries, and it has varied with the centuries. It would have been wholly true to say that God was the Founder of the Church, and Christ the Foundation.

The paper gave the impression that the notion that space and time were relative was the modern outcome of Einstein's Theory. But in all ages there have been idealists who have persuaded themselves of the relativity of time and space, and that the outside universe had no real existence. Indeed the notion of *real* time is modern, and is derived from Bergson. The quotation from Professor Carr is illuminating. It is one more testimony that what lies behind modern science equally with the modern religious cults is the

doctrine of the immanence of God. One has only to compare the scientific attitude to-day with that of fifty years ago to see how very relative it is. The full Christian teaching declares that God is transcendent as well as immanent; and in so far as He is transcendent He cannot be known except by Revelation. The Christian Revelation is absolute and universal and our only refuge from modern subjectivism.

Mr. W. HOSTE said: Certainly the "whirligig of time has its revenges." If there were two laws regarded as unassailable—the pillars of Hercules of modern science—they were the law of gravitation and the intransmutability of elemental substances. Now the universal application of gravity is questioned, *e.g.* the curvature of the path of a comet is apparently explained otherwise, whereas of course it was included in Newton's formula of gravitation, and as for "intransmutability," "Radium is the philosopher's stone." If the Holy Scriptures had taught explicitly the Newtonian theory of gravitation and poured contempt on the transmutation of metals, it would have been up to date till now but would henceforth be a back number. As our regretted colleague, the late Chancellor Lias, so lately deceased, once said, "Science is knowledge, but knowledge must be exact up to its limit." This is why the true scientific man of the first rank is modest. Newton was markedly so, we are told. Is there room to hope that the third-rate scientists of the penny press will become less cocksure in face of the latest discoveries? It is to be feared not, for they do not burden their memories with the inconvenient discoveries we have been speaking of.

Mr. W. E. LESLIE strongly protested against the character of the paper, and added: The extracts from Lord Balfour and Prof. Wildon Carr are of interest. Space forbids detailed criticism, but attention may be called to such outstanding defects as the statement that light is deflected in a gravitational field because it is composed of "particles of matter," and the reference to the length of the day in Mercury and Neptune as an example of the relativity of time!

Turning to the subject, we must ask "What is philosophy?" I suggest that it is the attempt to arrange the totality of our knowledge in one co-ordinated whole. Christian philosophy, in its narrower sense, is a similar co-ordination of those facts in which

Christians are peculiarly interested: in its wider sense it is any system or systems of philosophy in harmony with the Christian revelation. I think personal idealism most nearly conforms to this condition, and it is profoundly interesting to observe that, starting from purely physical data, physicists and mathematicians are, since the era of modern theories of Relativity, moving steadily in that direction.

Col. Biddulph pointed out that the planetary day has nothing to do with the new theory of relativity.

The Rev. J. E. H. THOMSON, M.A., D.D., writes: "(1) One would desiderate a little clearing up of the meaning of terms. The title of Mr. Coles' paper would be applicable to Dean Mansell's Bampton lecture on 'The Limits of Religious Thought.' From the relativity of human thought Mansell maintained that all our affirmations or negations concerning Deity could at the best be only approximations to the truth—a view that occasioned keen controversy sixty years ago. The relativity contemplated by Mr. Coles is totally different; it is not subjective but objective relativity.

"(2) In the triad adopted by Mr. Coles—space, time and matter—the last is on a different plane from the former two. Might not force be a more suitable term? All our senses reveal to us force resisting us or resisted by us, and from this the existence of matter is deduced.

"(3) I venture to challenge the accuracy of the implication contained in a statement of Mr. Coles (p. 124). He there says, 'Prof. Einstein has gone a step beyond Newton, and proved that light itself is composed of particles of matter,' implying that Newton did not believe in the corpuscular constitution of light. In the "Encyc. Brit." (11th ed.), vol. xvi, p. 614a, I find it said: 'The authority of Newton retained for it (the corpuscular theory of light) an almost general acceptance till the beginning of the nineteenth century.' Einstein has thus not gone beyond Newton but has gone back to his view."

Dr. W. WOODS SMYTH writes: "I have sympathy with a leading scientist who has said that 'it seemed as if the Creator Himself could not understand Relativity'! However, Mr. Coles mentions something in relation to motion which we can accept with interest, when they are stated, and with wonder. That a rod moving swiftly on

end should shorten considerably; that a rotating disk, instead of enlarging, should contract its diameter—are very wonderful. The bearing of Relativity on Christian philosophy seems to point to the fact that increased progress in science only deepens the mystery of all things and their forces, and of men and their ways, and, beyond all, the Universe of God.”

Mr. A. T. SWAINE writes: “It is quite evident that the author does not understand relativity.

“Space, time and matter are not different ideas for different observers; they are the same for all observers so far as they are ideas or concepts. It is their *dimensions* which vary with every observer. Quite contrary to the frequent assertions in these pages, the relativist has little concern with ‘space, time and *matter*.’ He is deeply concerned with the measure of space and time and of *motion*. The idea of matter is rarely, if ever, discussed. The author drifts on to a discussion of the ‘ether’ which has no place in relativist thought. Following this he gives us the two discoveries of Einstein: (1) ‘He has proved that light is composed of matter.’ This is neither a discovery of Einstein nor is it consistent with recent physical science. It is true that, arising out of his theory, Einstein suggested that light rays would be deflected in passing the sun, and that this was corroborated by the astronomical tests. But that light rays are material does not follow. As the author himself *quotes*, ‘Electrical energy is the Universe itself.’ If, then, he were philosophically consistent, he could not contradict himself and say that light is material. The fact is that, according to the most modern view, matter is energy, and therefore light is a form of ‘matter.’ (2) The other discovery of Einstein is ‘Relativity.’ This again is not true. Relativity was known and discussed long before we heard his name. He proved its application to all the laws of space, time and motion and co-ordinated them in the space-time continuum.

“In the ‘deeper problems’ he again quotes, ‘Space has properties contingent upon the nearness to the sun.’ This is by no means true. Space may have properties contingent upon its nearness to every ‘material’ body contained within it, but this way of putting it jumbles the old materialism with the newer view. It is more correct *now* to say that the sun, the stars, the earth—in fact every

material particle or body—is a property of space ; space cannot be spoken of as real or apart from ‘ things.’ One cannot exist without the other in a space-time continuum.

“ Throughout the paper we discover no mention of the salient and fundamental facts of Relativity or of the philosophy which arises therefrom.”*

Dr. A. T. SCHOFIELD writes with reference to Relativity and Christian philosophy : “ What one really craves for is the ‘ relativity ’ of the two. We want a clear idea in what ways modern discoveries tend to endorse or question the truths of Christian philosophy. We have no difficulty in believing that Divine Revelation transcends human research. What we want to know is the real bearing of the one on the other ; and the very invasion by science of philosophic fields makes this inquiry all the more urgent. We therefore thank the author for what he has given us, but we want more, much more.”

AUTHOR'S REPLY.

Dr. Schofield will agree that modern discoveries support the exalted language of Holy Scripture as to the glories of the created Universe.

Mr. Swaine seems to forget how difficult it is to arouse general interest in these questions. My quotations from popular writings were not meant to be taken as my own judgment in every instance.

Mr. Woods Smyth's comment, “ that the bearing of Relativity on Christian philosophy seems to point to the fact that increased progress in science only deepens the mystery of all things and their forces, and of men and their ways, and beyond all, the Universe of God,” will commend itself to most of us.

Rev. J. E. H. Thomson : “ Einstein has not gone beyond Newton, but has gone back to his view as to the corpuscular theory of light ” is what I myself intended to convey.

The Chairman, of course, was right in pointing out that idealists in all ages have held the relativity of time and space. I did not intend to convey anything to the contrary.

* The above extract represents only half of Mr. Swaine's criticism of the paper.