# V

## NATURAL THEOLOGY

We have seen that the naturalistic account of the universe which is, I think, to-day practically identical with that view which asserts that science alone provides a true interpretation of the universe, has two fatal weaknesses. Critical analysis of the scientific method has shown that while admirably competent for certain special purposes, it is inherently incompetent to deal with the whole of human experience and, further, that when we attempt to use it for these broader purposes it leads us to a plainly distorted account of what in our saner moments we know to be true and valid. I have examined some of these plain distortions. It can give only a caricature of human history, and also of the moral life of man, and it also leads to the denaturing of truth itself into a mere utility. Consideration of the moral consciousness has led us to a more comprehensive view of the world which seems to be capable of containing all that is true in the scientific account, while yet at the same time it recognises to the full the distinction between good and evil, truth and falsehood.

In the last resort the great issue as to whether the universe in which we are living is fundamentally sub-moral, sub-human and sub-rational, because impersonal and unconscious, seems to me to turn,

above all, on the question of whether I ought to do the highest that I know. Here, as I have said, we have to make a definite judgment and a definite decision. I have put that, therefore, in the foreground, and have drawn the first consequences from it, that the ground of the universe is rational and moral, and that it is realising a moral purpose. But that there is much in the universe besides this moral judgment which confirms this view of the world source and ground, I do not doubt. These lectures make no claim to be a complete discussion of Theism, and must necessarily, therefore, leave much on one side. But there are certain broad characters in the physical universe that are so intimately related to the track of thought which we are following that I propose to speak briefly of them in this lecture. These are the mathematical structure of the physical universe and what I can only call its extravagant beauty. What explanation can we give of these, and how far do they confirm the general conclusion reached in the last lecture? Here we enter the domain of Natural Theology.

Long before the dawn of modern science the Greek geometers and the Arabian algebraists had wrought their systems of spatial configurations and symbols, as it were, out of their heads. They had no doubt started from a primitive observation of what was in Nature. But they had greatly abstracted from Nature in forming their concepts. Nature is by no means obviously mathematical. She is full of the flowing, the irregular and the broken. How rarely do we see anything that looks strictly geometrical in a landscape! Thus there is the circular curve of the horizon line, but it is

almost always irregular and broken. When do we see a perfect triangle, or square, or really straight line that is not of human construction? The nearest thing one sees in Nature, perhaps, to a geometrical diagram is the system of widening circles caused by the splash of a trout in still water. But even water is not usually still! Superficially Nature does not appear to be geometrical. But these early geometers got to work upon crude Nature and abstracted away all her individualities, and analysed her bewildering complexities, and got their symbols, the line, the circle, the square, the rhomboid, and so on. Then they analysed the properties and relations of these abstractions, and gradually wrought out the world of ancient geometry.

Typical of the whole process was the development of the geometry of conic sections. Following, no doubt, observations from Nature of approximately conic figures, perhaps the shape of bare volcanic mountains, or of some homelier objects, "fillers" of bottles, or headgear or children's toys, or perhaps by simply imagining a circular pyramid, the Alexandrian geometers formed the highly generalised and abstract idea of the cone. Then it was discovered that by transecting it at various angles by the similarly observed and generalised figure of a plane, the outlines of the surface revealed various new curves. If the cone was cut straight across they got the familiar figure of a circle. If it was cut at another angle they got an ellipse, if at others a parabola or a hyperbola. Then they got to work upon these curves and discovered that these had common properties. They

supposed imaginary lines and imaginary points, directrices and foci, which stood in certain relations to these curves, and which could be expressed in algebraical formulæ, and so for the sheer intellectual pleasure in the process, they developed the whole geometry of conic sections. Then in effect the whole intellectual creation was pigeon-holed for a millenium and a half. The world went on its way, Jesus Christ came, and died and rose again, the Church came into being, the wild races of the north broke through the Roman walls along the Rhine and across the moors of Northumberland, and poured through the Alpine passes; the Dark and Middle Ages followed; the Crusaders brought the algebra of the Arab mathematicians into the field of Western thought, and Copernicus developed his astronomical theories, and Galileo his telescopes; new planets swam into the ken of the watchers in observatories, new comets flared in the heavens and a startling discovery was made. "The planets moved in ellipses, the satellites of Jupiter in circles, and the comets in elliptical, parabolic and hyperbolic orbits."[1] It became necessary to take the ancient parchments out of their pigeon-holes once more. The play of the intellect of these long-vanished geometers of Alexandria had unawares penetrated the secret of the heavens. Can we imagine a more impressive proof that there is some deep likeness or kinship between human intelligence and that which underlies the world?

Modern physics and mathematics have furnished us with another striking example of the same principle in the way in which the theories of Riemann,

[1] Flint's *Theism*, pp. 134-35.

with the new geometry which he developed, so to speak out of his own head by simple reasoning, led on to the discoveries of Einstein, with their final verification by astronomical observation.

But, as we have seen, the later developments in physics have been passing more and more over into mathematics until astronomers like Sir James Jeans are found asking themselves and the public whether there is anything material left in the universe at all; whether when physics has pressed the last questions home there is anything left but mathematics. "The universe," they say, "is becoming much liker a thought than a thing"; and this would seem irresistibly to suggest an intimate relationship between the human intelligence and the entire structure of Nature.

It will certainly not do to explain this as Naturalism must necessarily seek to do, by saying that it is due to the fact that Nature has produced the mathematical faculty in man just as she has produced his muscular constitution by the struggle for existence, and survival of the fittest. We might as well say that the struggle for existence produced the genius of Shakespeare or Beethoven. We might as well say, to use Dr Rashdall's apt illustration, that "the cane of the schoolmaster produces the intelligence of the pupil." The struggle for existence may have some part to play in overcoming the indolence or self-indulgence which inhibits the intelligence from awakening, and putting forth its powers. But of what immediate use were the Alexandrian astronomers as a whole to their city and people in the struggle for existence, compared with soldiers and tradesmen and artisans?

A few of them might be engineers also, like Archimedes in Syracuse, and devise war engines as well as work out apparently futile theories like the geometry of conic sections. But it is difficult to see how a type of intelligence whose labours had to wait for fifteen hundred years before they could be utilised, could be the fittest to survive in an urgent daily struggle for existence. Some better theory must plainly be devised to explain the deep affinity between the human mind and the world of Nature.

I am desirous not to press the point in my own words unduly, and shall, in spite of repetition, let two others, neither of them prejudiced witnesses, re-state it for me.

No one is more competent to speak on the history of science than Professor Burtt, the author of *The Metaphysical Foundations of Modern Science*. Let us hear what he has to say on the relations of the Alexandrian theories, not only to the paths of the planets, and the comets, but to the whole later course of science. In a smaller volume[1] written about the same time as the impressive book to which I have referred he says: "We are all aware that mathematics is, so to speak, the logic of exact science. I mean by this, that it prescribes the exact quantitative structure in terms of which all laws of exact science must be worked, and whose relations their deductions constantly use. Now one of the most striking themes in the history of science is the way in which abstract thinking in the form of those mathematics has faithfully fulfilled its functions of outstripping the emergence of

[1] *Religion in an Age of Science*, pp. 116-17.

other scientific problems, as also the way in which problems depend upon the victory of mathematics if they are to be exactly stated and clearly solved. One of the most striking examples of this is the theory of conic sections which was developed by the Greek metaphysicians. These ancient geometers did not dream of any application of their results to problems in other sciences, with them it was a matter of pure mathematical theory, proved because of their spontaneous delight in the discovery of a geometrical order. For a millenium and a half this theory of conic sections remained sterile, simply maintaining its place as a branch of geometry, and furnishing the minds of mathematicians with a group of curves, with which to play in any geometrical speculation to which they seemed relevant. Then when Descartes created his analytic geometry as a new tool for the application of mathematical theory to the astronomical problems exercising thinkers of his day, a totally unexpected application of the theories of conic sections became possible. For not only could the essential nature of the various curves be expressed in a simple algebraical formula, namely the general equation of the second degree, but the whole theory of the motion of bodies under the forces of attraction and inertia proved to depend upon the mathematical principle exhibited in the conic section and symbolised by the equation. Bereft of the groundwork of pure mathematical theory spun forth without any idea of further application, the great scientists of the seventeenth century would have lacked a store of exact ideas, pointing to consequences of experimental verification to

which they could fruitfully resort in their endeavour to formulate the laws of motion."

The principle that the mind can discover the foundations of the entire physical universe, and that these foundations are mathematical, is strikingly expressed in a recent lecture by Einstein on the method of Theoretical Physics: "What then was the place of reason in modern science? Reason enabled us to form concepts and laws for a theoretical system, and the consequences of these laws and concepts ought to correspond with the results of our experience. The basic concepts of a system were entirely fictitious and created in the mind of the theorist. In the eighteenth and nineteenth centuries that had not been understood. Newton was the first to offer a comprehensive theory of physics, but Newton believed that his concepts could be revised from an abstraction of the data given by experience. From the way in which Newton expressed his theories, however, it was clear that he was by no means comfortable about the concept of absolute space, because nothing in the experience seemed fully to correspond with it. Physicists in the eighteenth and nineteenth centuries did not recognise these basic concepts as a free invention of the human mind, and believed that they could be re-derived by a logical process from the facts of experience. Was it possible for the physicist to create a correct theory that would be a transcript of reality, or did such a theory not exist at all except in the imagination? He (Einstein) firmly believed that it was possible for the theorist to create such a perfect system. Our experience justified us in thinking that in Nature

could be seen the ideal of mathematical simplicity. It was within the power of the theorist to discover the laws and concepts which would give us the key to the understanding of the phenomena of Nature. Experience could not provide the key, although it could guide one in the theories of the mathematical processes to be used."[1]

The meaning of this is clear. Mathematics is a creation of the human mind or imagination. It is not a mere copy or imitation of what is observed in Nature, a theory held by some to-day. This is brought out by the word "fictitious," and by the clear statement that experience cannot provide the key, although it can start and "guide" the creative imagination. Mathematics, we find, enters so deeply into the constitution of Nature that the best-known living representative of physical science believes that the ultimate constitution of Nature is mathematical without residuum. He cannot yet prove it, but says that he "believes" it, and that it "ought" to be so, which is a plain judgment of value.

It seems quite clear to-day then, first, that mathematics enters deeply into the constitution of the physical universe, and secondly, that mathematical theory is certainly something a great deal more than a mere imitation or reflex of observed natural processes. It is, as Einstein says above, the product of "imagination," not of observation and memory, "creative" of thought, and shooting far ahead of what has been merely observed. Mathematics is clearly a kind of thought. But there cannot be thought without a thinker. Thought is a mere abstraction derived from the realities, which are

[1] Herbert Spencer Lecture, *Times* Report, 11th June 1933.

thinking minds. The inference is inevitable that if there is thought in the structure of the vast universe, there must be a Thinker behind it. For since it is a universe, one vast whole, the supposition that there are many intelligences behind it, while logically possible, is plainly redundant and unreasonable. The natural conclusion, therefore, as Jeans suggests, is that behind and over all there is an intelligent Mind. Now while this only carries us part of the way to belief in God, it is surely a conclusion of far-reaching moment. Of itself it disposes of that Naturalism which holds that the universe is in its final reality mere matter or energy, or "Space-Time with a nisus (or tension) in it." It gives us a Mind behind all things. Be it remembered that mind is also an abstraction. The only minds that we or anybody know are personal minds, minds in which in every act of thought there is will and emotion to drive it on. An impersonal intelligence is well-nigh as violent an abstraction as is thought.[1]

But leaving that aside, and contenting ourselves for the moment with the result which the nature of the universe seems to demand from us, that there is Intelligence behind it, let it be noted first of all how entirely it corresponds with the results reached in last lecture, that there is a moral Source of all things, creating moral values and claiming a personal moral authority to which we owe unconditional obedience.

There is a further result of the conclusion that mathematical principles underlie the structure of the physical universe. We are in these lectures dealing primarily with the riddle of the world.

[1] See article by Archbishop D'Arcy, *Philosophy*, July 1932.

The question as to whether we can legitimately use any element in human personality to throw light on that vast and formidable environment out of which we have arisen, and into which we shall one day apparently be merged again, is of capital importance. Is not the real question, whether Nature is a mere surd quantity which cannot be rationalised at all, which is simply *there*, and which it is our wisdom to make the best of, or whether it is an intelligible purposive system, moving on to as yet unrealised moral ends? On the former view all religions and all idealistic philosophies are simply pathetic anthropomorphisms, mere "wishful thinking," creations of man's futile desires, and all the gods and all the Ideas of Plato, and the "Entelechy" or immanent purpose of Aristotle, and the Categorical Imperative of Kant, and the Absolute Reason of Hegel, are only Brocken phantoms of man himself, thrown on the mist of the unknown and unknowable.

But surely if there is Mathematical Reason in the universe which is discoverable by our reason, if it is objectively "out there" beyond all possible denial, "out there" whether we recognise it or not, "out there" whether men and women had ever lived and died or not, in a word, in the fullest sense objectively existent, that is of decisive moment. To admit it is to break clear of mere scepticism in any of its forms, and to find in the universe outside of us something deeply akin to man. In that case it becomes lawful to use personality as a key to the universe.

Moreover, since the development of the mathematical reason comes late in the history of human

evolution, and still later in the story of organic evolution, it is reasonable to conclude that the more man develops his true nature, the more deeply will he be able to understand Nature. The more he becomes himself, the more deeply will he understand her. Now the æsthetic sense is certainly part of the essential nature of man, as certainly as the scientific and mathematical reason, though its full awakening like theirs comes late in his development.[1] If we become more at home in the universe as we discern the order which underlies its apparent confusion, so when we discern loveliness in it too we become aware of something which, as it were, greets us with a welcome, and calls out an answering welcome and love.[2] Out perception of beauty in Nature cannot be harmonised with the naturalistic conception of the universe as consisting of mere irrational substance. It is impossible for mere Naturalism to give any intelligible account of the extravagant beauty of the universe.

"In an inquiry into the significance of 'Animate Nature,'"[3] said Sir J. Arthur Thomson, "there is no getting past the fact of beauty. It is a reasonable and verified belief that we get at something in this way, which can be reached by no other, certainly not by scientific analogies or by logic. There are curiously few general affirmations that we can make about Nature; one is that Nature is in great part intelligible or rationalistic, and another is that Nature is in greater part, beautiful." Thomson's attractive book deals mainly with "Animate

[1] Though there are exceptions to this even in prehistoric times, it is, I think, broadly true.

[2] Temple, *Nature, Man and God*, p. 253.

[3] Gifford Lectures: *The System of Animate Nature*, p. 258.

Nature" and in particular with the loveliness of living things. He admits varying degrees of beauty. He goes on to say that the advance of science, though it was none of the direct business of science to do it, has been greatly to extend our survey of beauty in animate Nature. If the popular impression be that beauty is the exception, the scientific impression is that beauty is the rule. For a long time, perhaps till the middle of the nineteenth century, beauty was very generally spoken of as a quality of the exotic—the orchid and the bird of Paradise—now we discern it most at our doors and Kipling's lesson has been learned, for "we find naught common on the earth." He goes on to make a further claim: "What seems to us to be a fact, and a very interesting fact, is that all natural living, fully-formed healthy living creatures, which we can contemplate without prejudice, are in their appropriate surroundings, artistic harmonies, having that quality which we call beauty. To many of us . . . of the eye-minded type, the blotting out of the annual pageant say of flowers and birds, would be the extinguishing of one of the lights of life."

Of the infinite wealth of beauty in the world of living things, the symmetries of form, the grace of movement, the brilliance of colour, in bird and beast, in the swift creatures of the waters and in flowers who can tell the tale? The very names of these lovely living things are like music to us as we name them. The fern, the violet and the rose, the hawthorn and the plain green grass, the swallow in its glancing flight, the red deer in its race through the heather, the kine motionless in the field, these are all beautiful things representative of countless

others. I have taken these illustrations from the temperate zones, but every zone could give its own creations of beauty and grace. They are, however it may be said, selected examples, and ugly and grotesque creatures could be cited also as examples of what misshapen abominations Nature is capable of bringing into being. Alligators and vultures are as truly products of her laboratory as are graceful forms of life. It is true that though, like the writer above quoted, we may find room for the category of "difficult beauty," and admit that even in their own setting and biological environment they have a beauty of their own, we may unreservedly grant that not everything in Nature appeals to the normal sense of beauty in man.

We who hold the Christian interpretation of the riddle of the world have to allow for the possibility that something of the freedom and contingency which exists as we believe in man, may reach down into Nature. The new quantum theories of matter seem, as we have seen, to indicate the possibility of individuality and contingency reaching down into the fundamental physical world. There is even more likelihood of its existence in the sphere of living things, and in that case there may be aberrations from the Divine Order even in the sub-human living things. But what can, I think, be unhesitatingly maintained is the overwhelming preponderance in living Nature of beauty and grace over what is hideous. Ugliness and tameness are all too frequent in human productions, but when we speak of an artist as having "returned to Nature," we always instinctively think of him as having taken a fresh start towards ideal beauty.

Now what are we to make of this element which is so preponderantly intertwined with life everywhere? Can we account for it solely in terms of the Darwinian ultimates, the struggle for existence and survival of the fittest? Taken in its simple naturalistic form I do not see that that is possible. If beauty and grace were simple utilities it would be another matter. But can we say that the beauty of living things is such a utility or that it helps them to survive? A stag's speed helps it to survive, but do its grace and beauty? Nor is it enough to say that its beauty is a secondary consequence of its health, and health is a utility. For as we have seen there are healthy creatures whose beauty, if it exists at all, is of the "difficult" kind!

Darwin has endeavoured to account for the beauty of animate creatures as a sexual character of species, developed in order to attract them to each other. In this way it becomes a utility, a secondary consequence of that differentiation of the sexes which is essential for the survival and development of the species. That it has this practical function need not be questioned, but that by no means explains the presence of beauty everywhere in the animate world. Is not the deeper question: Why should living creatures have been so made that sexual attraction should have produced such profusion and elaboration of lovely things? It is well known what searchings of heart were given to Darwin's mind by the peacock's tail! But more important by far is the fact that the theory does not even begin to account for the loveliness of inanimate Nature, and surely any satisfactory account must include them both. How are we to explain the

marvellous beauty of the astronomical, the physical and the moral worlds, "the starry heavens above and the moral law within." There can be no question of sexual love in the wonder and awe which we feel in looking out upon the great constellations on a winter night, or the beauty of mountain and river and lake, or in the emotion which rises within us when thinking of

> The moving waters at their priest-like task
> Of pure ablution round earth's human shores,
> Or gazing at the new soft-fallen mask
> Of snow upon the mountains and the moors,

or any of the myriad things of beauty in the inanimate world of Nature. Nor can we possibly find any sexual origin of the intellectual beauty which we find in mathematical forms or demonstrations, or above all, of the moral beauty manifested in pure and great characters. There is surely something in common in all forms of beauty, and to reduce them all to a useful biological character would be a truly desperate distortion of Reality. Yet it is difficult to see how, on a consistent naturalistic theory of the universe, one can do otherwise. For on this view the ultimate realities, however we may arrange and describe them, are space, time and energy, and all the values and qualities are man's subjective emotions projected upon these and ascribed by an illusion to these measurable physical entities. They are, as Mr Huxley says, one and all "created" by man. This can only mean that man creates them within his own mind. They can only be subjective states of his own consciousness, developed in the struggle for existence for biological

reasons, that is to say, survival purposes. The objects on which they are projected in the last resort can only be space-time patterns, which, owing to difference in their conformation, produce these subjective states. Let him believe it who can!

It is clear that in this matter of the beauty of the physical universe we are face to face with the same kind of issue as was dealt with in a former lecture as to the real nature of the Good and the Right. It is, I believe, impossible to explain what I have called the extravagant beauty of Nature in terms of naturalistic evolution, just as it is impossible under the same philosophy to explain goodness and duty. The beauty of Nature is "extravagant" because there is no apparent need for it and because it is so abundant. Much of it is entirely gratuitous, if utility is all. Yet who will say of it, as many say of the apparent lavishness of the evolutionary process, that it is a wasteful incident of the struggle? What pessimist will impeach Nature for her glorious raiment and the majesty of her movement? "Beauty is its own excuse for being."

Nor can we, in presence of this strange irrelevance in our apparently utilitarian universe, find relief in the modern conception of "emergent evolution." It is impossible within the limits of this lecture fully to discuss this singular hybrid view of the universe, as it has been called, which is at present so popular in certain schools of thought. It is an endeavour to combine a mechanical view of the universe of Nature with elements borrowed from a purposive view. Natural process is supposed to be rigorously continuous, yet, strange to say, on the theory of emergent evolution, in an unbroken system of

causes and effects new elements appear in the course of evolution which could never have been predicted as the result of their antecedents, and which have full power to change the course of events which follow their appearing. How this can be reconciled with "continuity" it passes my understanding to say. In spite of the many notable philosophers and men of science of our day who are working with this conception, it seems to me in its naturalistic form too plainly self-contradictory to endure. It is, as has been truly said by Dean Matthews[1] and others, a mere descriptive account of what Nature appears to be like to purely scientific thought, combined with a description also of the undeniable fact of the emergence of novelty in the evolutionary process. But there is no *explanation* of how anything actually new can possibly come into existence without a cause for it. Dr Lloyd Morgan, the main initiator of the theory of emergent evolution, himself believed in a God behind the process. But many who hold the theory discard this faith, and are left with what seems to me the fatal result of believing in the possibility of something new emerging "out of the everywhere into here" without a Creator. It is much that they recognise that in life we have the emergence of new realities that cannot be explained in terms of the inorganic, and above all that mind cannot be explained in terms of life. But nothing whatever is explained by saying that they emerge, without saying what causes their emergence. The theory is obviously transitional and cannot endure.

[1] *The Mind: a Symposium*, Chapter on "Philosophy," p. 171.

Certainly beauty can hardly be explained as a merely emergent character, for it is diffused throughout the entire universe, physical, biological and human. It cannot "emerge" as a novelty like life and mind, for it was there all the time waiting to be recognised, as the mathematical structure of the world was waiting to be discovered.

This character of beauty must always be an alien and utterly perplexing element on any naturalistic view of the world. Can we account for it on that spiritual interpretation which has been gradually rising before us as we have been widening our view? We have seen that the mind of man has found in the very structure of the universe something deeply akin to itself. Is it at all surprising that in view of this it should find another character profoundly akin to the deep desire of its own imagination for ideal beauty? Surely the spectacle of dawn over the great waters, of noonday, or of the soft falling dusk, of the great constellations, of the pageant of the seasons, speaks to something in us kindred to itself, just as hideousness, disproportion and discord shock us as something alien. We feel that we find our true selves when we stand in wonder and admiration before all glorious and lovely spectacles in Nature. This becomes obvious when we consider the nature of art. There is that in man which responds to the call of outward beauty, and seeks to emulate it and even surpass it by creating beauty. Art is the human response to the outer summons of the beauty of the world, deep calling to deep. We have here another form of the same kinship between the environment and the human mind, which we find in the structure of the

whole. How close is the relationship comes out in the mathematical element in musical harmony, in the proportion of light and shade in painting, in symmetry in sculpture and rhythm in verse, as in the artistic element admittedly present in mathematical constructions.

We are assuredly warranted, then, in finding in beauty, as in the mathematical view of the world, an analogy between the human mind and the creative Mind which we discern in nature. Let us use this analogy as a clue to the meaning of the beauty of the earth.

The vision of the poet demands expression in a form worthy of his theme. Can we imagine Dante in Ravenna, haunted by the beauty and terror of human life seen "under the form of Eternity," choosing as his way of expressing that vision the prose in which he wrote the *De Monarchia*, or still less the colloquialisms which he and the other Florentines of his time no doubt used in the ordinary affairs of daily life in the market or the camp. The Vision of Hell, Purgatory and Paradise took other forms. It took the new popular speech, it is true, but selected from it its finest colours and sounds. Its thought clothed itself in glorious raiment "dipped in hues of earthquake and eclipse," it moved in sonorous rhythm and cadence, like the thunder of the sea. It expressed great thought in a great way. Does not this human analogy throw light on the extravagant beauty of Nature?

> God, in His working,
> Is Eldest of Poets,
> Unto His music
> Moveth the Whole.

This faith alone gives an adequate meaning to beauty and the place which in its higher moments humanity has given to art. Something great and splendid is being achieved in Nature and in history. Nothing less than this is involved in the beauty of the earth and of the heavens. It ought to be a reassurance that something worth while is going on! The poet and the musician and the painter are they to whom it has been given to discern the beauty and the harmony of the process, as the mathematician discerns the order, and every fragment of that beauty or chord of that harmony is part of the treasure of humanity, for it is part of the revelation of God.

If this be a true account of the manifest beauty of the world, certain conclusions would seem to follow. There must be some closer relation between that philosophy of revelation which we call theology and the realm of beauty than theologians have always realised. The creeds should be such as men can sing. The churches should be places of beauty and dignity, however plain, for the entire life of the soul in communion with God is communion with the First and only Fair. On the other hand, is there no deep relation between the sterility of art in certain periods and their want of faith? When faith in God wanes the world contracts, belief in the meaning and worth of human life contracts too, and art becomes absorbed in the elaboration of trifles and externals and grotesques instead of elemental realities. This is not to say that great artists are necessarily men of faith. It is notorious that many of them are not. The case is not so simple as that. The real question

is as to whether they would not be greater artists if they were. Yet I think it is broadly true that the ages of faith, or their immediate successors before the momentum of ancestral faith has died away, and before that energy of faith in life which real faith in God brings with it has waned, have been the creative ages in the imaginative arts. Only when men believe in their hearts that something worth while is going on, have they the courage and energy for creation and for revealing the glory of Nature and human life. And we have really no assurance that anything transcendently worth while is afoot in the world, apart from faith in God.

We have now reached a point in our criticism of the fundamental position of Humanism that science alone can give us a true account of the world and of human life, where it seems desirable to sum up the alternative positive view of the universe, which has been emerging from that criticism. Instead of a merely physical system of causes and effects, such as Naturalism supposes the world to be, we have a spiritual and purposive order, a system creative of moral personalities, such as inevitably implies a sovereign, all wise and moral Power, creative of human spirits capable in their human measure of communion with Himself.

That this larger conception of the universe can contain the narrower scientific view, taking it up into itself, and transforming its system of causes and effects into a realm of means and ends I

have already tried to show. But it can do much more.

(1) The spiritual interpretation alone can do full justice, first of all, to that element of individuality which is found in every part of animate Nature. In these lectures I shall make no attempt to give any philosophy of Nature, except as it bears on our real subject, the mystery of man's lot in a physical universe. Nature has her own mysteries and presents her own hard problems, but these are outside our immediate purpose, save as they bear on the human problem. We are concerned not with a Theodicy of God's ways with plants and animals, but a Theodicy of His ways with man.

Now, on the larger spiritual view of the world we have the fullest justice done to the fact of human individuality. Its origin, development and conservation are indeed regarded as part of the end of the cosmic purpose. But the element common to all individualities is also recognised to the full. This, as we have seen, is the sphere of science, which thus is included in the larger view, and is, indeed, essential to its completeness. The whole spiritual conception of the world turns on its being a purposive system, in which the making and training of personalities is a chief end. (2) But human personalities cannot live a moral and spiritual life as isolated units, they can only realise their personalities as elements in a society. Take any one of the great fundamental virtues, faith, hope and love, and it will be found to imply human relationships. Human beings in isolation cannot be full personalities. Yet they are more

than mere constituent parts of the society to which they belong, more than mere tools of the society. If individuals are to be full human beings, they must be free to choose between good and evil, truth and falsehood. Now if we will think out what these things mean, we shall see that to be a true home and school for such free human spirits Nature must be such that knowledge and science are possible. That is to say, it must be a system of order and law. Ritschl has said somewhere, and the remark is notable because it seems to run counter to his strong insistence on the deep distinction between ordinary knowledge and religious knowledge or faith, that if we knew all things we would no doubt be able to deduce the Law of Gravitation from the Love of God. It is fortunate indeed that such deduction was never forthcoming! At the time when the saying was uttered the Law of Gravitation seemed to, perhaps, most men of science much more certain than the Love of God. To-day most would be inclined to think that such a deduction was a clear proof of the untruth of the faith. This is a warning as to the dangers of a premature reconciliation of science and religion! But whatever we may say of the particular illustration, the principle is true of natural law in general. In order that man may be a free and full personality he must live in a society, and a society can only live and grow on the earth when that earth system is so ordered that men can form general concepts about it and reach general laws, whereby they can share their knowledge and forecast Nature's ways of workings. Here indeed is a paradox, which yet is obviously true, that necessity

is the mother of freedom and that freedom can only be reached through acceptance of law.

The spiritual view of the universe therefore requires such a form of thought as science as part of its larger whole. The "reign of law" in Nature is entirely in harmony with the love of God for mankind, and in his devotion to the discovery of law the man of science is fulfilling not only a human service, but a divine vocation. Is there not something of fundamental faith in God in that strange prejudice in favour of order in Nature, on which as we have seen all progress in science to-day, as always, depends? From this point of view we see that it is far more than a mere postulate, a "supposition" such as Naturalism is compelled to suppose it to be. It is a kind of intuitive faith that whatever she may seem to be, Nature is really friendly to man and therefore orderly in all her ways. "Faith," it has been truly said, "is always a going against appearances," and the labour of all the laboratories and observatories is certainly always a going against the appearance of disorder in Nature, and is sustained by a kind of instinctive optimism, that Nature must be better to man than she appears to be. We get here, therefore, in the spiritual interpretation of Nature a reasonable foundation for the whole enterprise of science, which must otherwise be ascribed to a mere blind supposition impelled by the physical will to live; in other words, a stubborn irrational prejudice of humanity, sheer "wishful thinking" of the plainest kind. Had this conviction as to the order of the universe been really only such a demand, is it likely that Nature would have

verified it in the way she has done? Does not the very existence of science show that there is a deep kinship between the vast system of Nature and the eager exploring human mind, such as the larger spiritual view of Nature maintains on other grounds to be the manifest truth?

(3) As we have also seen, the larger spiritual interpretation alone accounts for the moral life, whereas the narrower view of Naturalism distorts and denatures its values and validities as well, by reducing them all to subjective states of consciousness generated by the struggle for existence and maintained because of their utility to the group. This, as we have seen, makes all morality relative, and to a large extent experimental, for in ever-changing group environments, good and evil, right and wrong must fluctuate with their ever-changing consequences. Some welcome this as freeing mankind for indefinite experiment in virtue and in vice, or what used to be called by such names. What is quite obvious, however, is that it must break up all mutual confidence between human beings and between nations. If there are no fixed and immovable standards and duties how can there possibly be such confidence? How can I count on the decency and honour of my neighbour if he is free to experiment in shifty ways whenever the spirit moves him? And if there is no immutable law or standard for nations other than those maintained because of their advantageousness in the struggle for group existence, what hope is there of their escaping from the grip of that black fear which is to-day launching them anew on the race for armaments, with what everybody of reason and

goodwill knows will be the dire and inevitable consequence? Freedom to experiment may be bought at too dear a price. But a stable and yet progressive society even of the nations can be built on the firm foundation of a moral order of the universe. It can be built and maintained, I believe, if men will have faith in God. While I have been writing this book the world has been witnessing the tragic failure of the nations of Europe to live up to their pledged word of honourable obligation to the League of Nations. I cannot but remember that I once heard the late Bishop Brent tell the story how, at the time of the framing of that scheme for the peace of the world, he wrote President Wilson begging him to do all that he could to get the name of God into the Covenant of the League. Wilson replied that he entirely agreed with him, but that it was utterly impossible. So the Covenant remains a covenant between nation and nation, and not like the Biblical covenants, which no doubt suggested the name,[1] a covenant between man and God. No Supreme Judge is recognised as over all. When that happens absoluteness goes out of moral obligation and expediency takes its place. And under that rule it may be expedient, not only that one man may be unjustly sacrificed, but that one nation should be the victim. So confidence goes, and when confidence goes fear comes in.

(4) Further, it is only under the larger spiritual view of the universe, as we have seen, that we can

[1] It is interesting to note that the two men who had most to do with the founding of the League of Nations, President Wilson and General Smuts, were both bred in the tradition of the Reformed Church, which historically has made much of the theocracy and the covenants.

fully explain either the mathematical order or the gratuitous beauty of the natural world. God Himself has put His mind and heart into His creation, and His imagination as well, and He has made it the high calling of His children, as Kepler said, "to think His thoughts after Him," to share in His own joy in His Creation, and even themselves to become in their human measure, creators of new forms of beauty in colour, form and sound.

I believe, then, that we have broad and solid ground in the very nature of the world and of human life for the belief that that world is a spiritual and purposive order, and that that view of it which maintains that it is fundamentally non-rational and non-moral, because material, is narrow and unsound. The same is true of the refined modern version of the older Materialism such as that presented in Professor Alexander's *Space, Time and Deity*, known as Naturalism.

We have reached these general conclusions as to the spiritual foundations of the world, it will be noted, without travelling into the region of what is usually known as special revelation, the historical tradition which lies behind the Bible and the Christian Church. The argument has been based on the values and validities of the moral life and confirmed by certain broad and unmistakable characters of the natural world.

In recent decades a school of theologians has appeared which repudiates the whole of what has been called "Natural Theology," confines revelation to the Word of God contained in the Bible, and rests its conviction of the divine character of that revelation solely on the force of its appeal to

man's spiritual consciousness, and in particular to his sense of being a sinner, with the internal division and confusion which that entails, and his desperate need for that message of divine grace which at once speaks intimately home to his need, and carries with it the assurance of its own truth. That this is all true in what it affirms of the greatness of God's grace and its self-witnessing power I should never question. But the wholesale repudiation of inquiry into any reflection upon Nature and the soul of man as being of value towards an understanding of God's ways with Nature and mankind seems to me a dangerous mistake, which is due to a reaction against an over-estimate of what these characters of the world can tell us about its Creator, rather than to a solid positive estimate of their real though limited value.

If God really created the world it must surely be very disquieting if the world shows no signs of Him. If on the other hand, as is argued, the world is no doubt full of signs of its Maker, but man is so blinded by sin that he cannot discern God either through his intelligence or his moral nature, then it seems difficult to see how he should be able to recognise the divine Word of God's grace when it comes to him. If we say that he is utterly unable even to do that, unless by supernatural illumination which is unconditionally given to some and withheld also by the divine Will from others, then we are left with the old dreary controversy as to how we can believe God to be Absolute Goodness, when He creates men involved in a "mass of perdition" from which they cannot possibly escape save by His fiat, and leaves them to perish when He

could have saved them. That way of thought in our modern age must in the end lead, I believe, to an Omnipotent Being above Good and Evil, a fatalistically determined humanity, and the disappearance of personal immortality—in a word to Pantheism. Surely there is a better way of explaining the universe, at whose creation, we are told in an ancient Biblical writing, all the morning stars sang together and all the Sons of God shouted for joy. The whole position seems to me to ignore the fact that the validity of the appeal of the Word of God's grace to man presupposes the validity of man's consciousness of sin and need. That again presupposes some dim consciousness of the Divine, and of the validity of our moral consciousness, when it testifies to the radical difference between good and evil. Further, it presupposes man's freedom, for how can there be real guilt, if I am fatalistically doomed to feel and act? There is here at the very basis of the "Dialectic Theology" a whole nest of unexamined presuppositions, which are all challenged to the roots by the aggressive Naturalism of to-day. I do not think, therefore, that this age of all ages is one in which Christians can refuse to give a reason for the faith that is in them, or can leave any skeleton chambers of thought unopened.

Therefore with deep respect for the representatives of the Dialectic Theology, and the services which they have done in our day to the fuller recognition of the uniqueness of the Biblical revelation, and in the practical region, to the defence of the independence of the Christian Church against an almost overwhelming pagan nationalism,

I cannot agree with their repudiation of all such reasoning as is contained in this lecture. General revelation comes far short of the fuller knowledge which I believe God has given us of Himself. But the knowledge which it gives is real, and all truth is of Him.